63646

SERVANTS OF INDIA SOCIETY'S LIBRARY
PUNE 411 004

FOR INTERNAL CIRCULATION

To be returned on or before the last date stamped below.

26 APR 1977
13 AUG 1982

Dhananjayarao Gadgil Library
GIPE-PUNE-063646

NEWS BULLETIN

AUTHOR	TITLE	Bulletin Page No.
Frederick C. Mills	Aspects of the price recession of 1929-31 X:76.73.N3 G1	42
Meredith B. Givens	Employment during the depression. X:92.73.N33 G3	47
Frederick C. Mills	Aspects of recent price movements X:76.73.N33 G3	48
Solomon Fabricant	Recent corporate profits in the United States X:328.73.N3 G4	50
Charles A. Bliss	Recent changes in production. X:2.73.N3 G4	51
Simon Kuznets	Cross capital formation, 1919-1933 X65296.73.N3 G4	52
Frederick C. Mills:	Changes in prices, manufacturing costs and industrial productivity, 1929-1934. X:76.73.N34 G4	53
Leo Wolman	Wages and hours under the codes of fair competition. X:95loj952.73.N3 G5	54
Solomon Fabricant	Profits, losses and business assets, 1929-34. X:878.73.N3 G5	55
Frederick C. Mills	Aspects of manufacturing operations during recovery. X9:746.73.N3 G5	56
Wesley C. Mitchell & Arthur F. Burns	The national bureau's measures of cyclical behavior. X:74:(B28).73.N3 G3	57
Solomon Fabricant	Measures of capital consumption, 1919-33. X:322ok87.73.N3 G3	60
Solomon Fabricant	Revaluations of fixed assets, 1925-1934. X:877.73.N4 G6	62
Leo Wolman	The recovery in wages and employment. X:952.73.N4 G6	63
Leo Wolman	Union membership in Great Britain and the United States. X:96.3.N3 G7	68
Wesley C. Mitchell Arthur F. Burns	Statistical indicators of cyclical revials X:74L(B28).73.N4 G8	69
Frederick C. Mills	Employment opportunities in manufacturing industries of the United States. X:9:92.73.N3 G8	70
R.A. Young & B. Bernstein.	The statistical pattern of instalment debt X:10k6:(B28).72· G4	76-7
D.C. Holthausen etc.	The volume of consumer instalment credit, 1929-1938. X:10k6.73.N4 HO	79

cont. on next page

20.	Charles A. Bliss	: Production in depression and recovery X.20r74.73.N4 G5	58
21.		: Program of financial research. X;6:m.73.N4 G7	64
22.	David L. Wickens and Ray. R. Foster	: Non-farm residential construction, 1920-1936. X9(D1).73.N4 G7	65
23.	~~Kuznets (Simon)~~ Simon Kuznets	: National income, 1919-1935. X:31.73.N4 G7	66
24.	~~Leon Wolman~~	: Hours of work in American industry. X:951.73.N4 G8	71
25.	Simon Kuznets	: Commodity flow and capital formation in the recent recovery and decline, 1932-1938. X65296.73.N4 G9	74
26.	David L. Wickens	: Differentials in housing costs. X9(D1):26.73.N5 G9	75

Organization for Impartial Investigation

NEWS-BULLETIN

National Bureau of Economic Research, Inc.

To Find Facts Divested of Propaganda

No. 42 — 51 MADISON AVENUE (MADISON SQUARE) NEW YORK CITY — Dec. 23, 1931

GOKHALE INSTITUTE POONA 4

Aspects of the Price Recession of 1929-1931

By FREDERICK C. MILLS

(*Copyright* 1931 *National Bureau of Economic Research, Inc.*)

THE recession of prices that began in the United States in the summer of 1929 has persisted for 27 months, and has carried wholesale prices to a level approximately 30 percent below that prevailing in July, 1929. The inequalities which have developed among the prices of different classes of commodities during this period exceed any of which we have record for previous periods of price decline. These inequalities at once reflect differences among commodities in respect of conditions of production and distribution, and affect the processes of readjustment and recovery. They have become major factors in the current economic situation. The present review summarizes the general price changes of this period and defines certain prevailing price disparities.[1]

Comparison of Three Periods of Recession

The price declines occurring in 1907-08, 1920-21 and 1929-31 have been the most severe recorded in this country during the last thirty years. These are compared in the following table:

TABLE 1

Comparison of Price Changes during Three Periods of Recession, with Respect to Degree, Duration and Intensity of Decline[2]

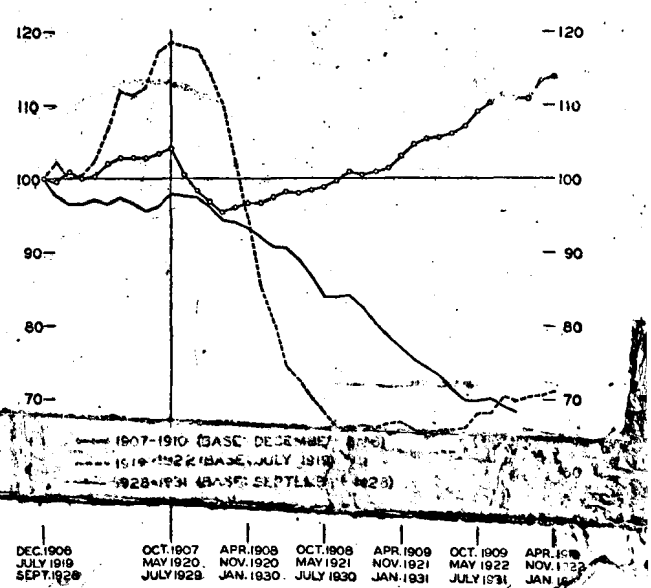
Period	Degree of decline (per cent)	Duration of decline (months)	Intensity of decline (average monthly rate of decline) (per cent)
1907-08	8.2	4	2.1
1920-21	45.3	20	3.0
1929-31	30.2	27 (to December, 1931)	1.3

The degree of price decline up to October, 1931, greatly exceeded the precipitate but minor drop of 1907-08, but fell short of that which occurred in 1920-21. As regards duration the current price recession has been far more severe than the brief four-months fall which followed the 1907 crisis. It has already exceeded by eight months the lengthy decline of the first post-war recession. The present decline has been less intense, however, than either of the other two. The rate of recession in the level of wholesale prices has averaged 1.3 per cent per month since July, 1929, as compared with an average rate of approximately two per cent in the 1907-08 decline and of three per cent per month in the 1920-21 drop.

These changes appear in greater detail in Figure 1, which shows the movements of the Bureau of Labor

FIGURE 1.

MOVEMENTS OF INDEX NUMBERS OF WHOLESALE PRICES DURING THREE PERIODS OF RECESSION



1—The situation existing in September and October, 1930, was discussed in "Some Aspects of the Price Recession of 1929-1930," appearing in a *News-Bulletin* of the National Bureau of Economic Research dated Nov. 22, 1930. The present Bulletin constitutes a revision and continuation of the earlier issue.

In this paper, as in the earlier one, comparisons are restricted in the main to wholesale prices. In a complete study of price inequalities and of correlated economic changes full account would be taken of alterations in other prices, in all elements of cost, and in incomes.

2—The measurements in Table 1, which are based on wholesale price index numbers of the United States Bureau of Labor Statistics, relate to the decline from the peak of the preceding recession to the low point preceding the next revival, for each of the periods 1907-08 and 1920-21. The figures for the current recession relate to the period July, 1929—October, 1931. The level of prices in October, 1931, was slightly higher than in July, 1929, the date the current recession from its peak began.

In computing the rate of decline the latter is looked upon as a cumulative process, and the average rate is therefore a com

Statistics index numbers of wholesale prices during each of these periods. In each case the index numbers are expressed as relatives of the value prevailing ten months before the recession began.

There are marked differences between these periods, with respect to the behavior of general prices. Prior to the beginning of the actual decline of 1907-08 the price level moved upward slowly; prior to the recession of 1920-21 the price level rose sharply. Before the current recession the price level sagged slightly. It is noteworthy that twenty-seven months after the beginning of the decline in 1907 prices were moving steadily upward, at a level above that preceding the break; twenty-seven months after the beginning of the 1920 decline a strong price advance was under way, though at a level well below the preceding high. Twenty-seven months after the 1929 break prices were receding slightly, at a rate appreciably lower than that which had prevailed up to the early summer of 1931.[3]

We have a picture here of a short, sharp liquidation in the commodity markets in 1907-08, a protracted and violent liquidation in 1920-21 and, to date, a process of liquidation which has been less intense in respect of rate of decline than either of the other two, more severe as regards duration, and falling between the two in degree of recession from the preceding peak.

Current Price Inequalities

The business world is affected directly not by movements of the general level of prices but by changes in the prices of individual commodities and, more particularly, by the inequalities of price changes which follow in the wake of such general movements. A commodity that rises in price less rapidly than the general average during a period of rising prices or falls more rapidly during a period of declining prices loses in purchasing power, per unit, and unless the loss is compensated by increases in the number of units sold producers of that commodity will suffer a loss of aggregate purchasing power. The reverse is true of a commodity that rises in price more rapidly than the general average during a period of price advance, or falls in price less rapidly during a period of price decline. It is through such changes in aggregate purchasing power that the economic center of gravity shifts from time to time, as economic power passes from group to group. Per unit purchasing power is, of course, just one element in the aggregate; changes in volume may play an even more important part in the shift of economic power. But during periods of rapid price movement changes in the price factor may dominate.

In tracing changes in purchasing power[4] during the present recession of prices we may first take as the standard of reference the situation prevailing at the peak in July, 1929. The figures in Table 2 indicate the degree of certain of the changes in purchasing power that occurred during the twenty-seven months between July, 1929, and October, 1931.

TABLE 2

Changes in Purchasing Power, per unit, between July, 1929 and October, 1931
Selected Commodity Groups[5]

Number of Price Quotations	COMMODITY GROUP	Degree of Change in Purchasing Power (Per cent)
140	Raw materials	—13.4
338	Manufactured goods	+ 6.1
163	Foods	—12.9
315	Non-foods	+ 7.3
81	Products of American farms, raw	—24.8
397	All other products (including processed farm products)	+ 6.0
285	Producers' goods	— 1.9
193	Consumers' goods	+ 2.8

[5] These measurements are based upon index numbers constructed by the National Bureau of Economic Research, from price quotations compiled by the United States Bureau of Labor Statistics. The index numbers are unweighted geometric means of relative prices.

The current price recession has involved a loss of percent in the average real value, per unit, of raw terials. The real value (i.e., the purchasing pow terms of goods in general, at wholesale) of manufa goods has increased by 6.1 per cent. Foods hav in purchasing power per unit, while non-foods gained. The real per unit value in wholesale marl products of American farms, in raw state, declin less than 24.8 per cent, while the value of all products (including manufactured farm products vanced 6.0 per cent. Producers' goods (i.e., raw terials or other goods which are intended for use in construction of capital equipment, or which must und further changes in form before being ready for consu tion) have been somewhat cheapened, while good shape for consumption have advanced in real valu

Liquidation in wholesale markets, it is clear, has most severe for raw materials, for producers' goods foods and for farm products. Sellers of these modities have suffered while buyers have gained, far as the price factor is concerned.

Recent Changes among Producers and Consumers' Goods

These broad categories conceal important ch among the prices of subordinate commodity groups. movements occurring among different classes of ducers and of consumers' goods are of central impor Relevant measurements appear in Table 3.

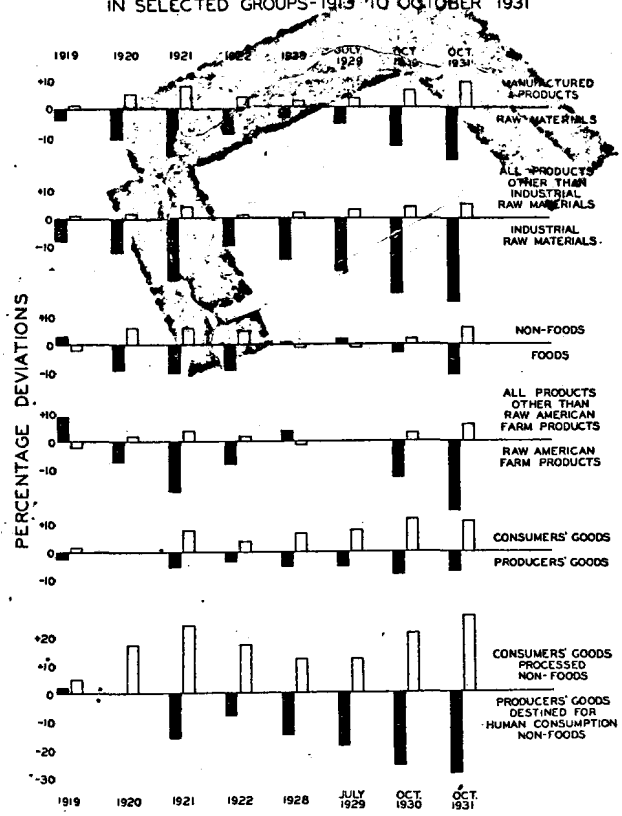
Producers' goods, that is, goods which are boug business purposes and not for consumption or direc suffered a loss of some two per cent in real valu unit, between July, 1929, and October, 1931. V this group there are marked divergencies of move Raw producers' goods suffered an almost catast decline, losing more than 16 per cent of their pe value, in terms of other goods, during this period. cessed producers' goods gained 8 per cent in real per unit within the same interval. The price p

[3] ...lesale prices for November, 1931 was but ... for October. During December price ...peared.

[4] ...chasing power of commodities in a ...y dividing the index of price ...lex of the change during the ...esale prices.

FIGURE II

GRAPHIC REPRESENTATION OF CHANGES IN THE REAL VALUE, PER UNIT, OF COMMODITIES IN SELECTED GROUPS-1913 TO OCTOBER 1931



(In the above chart changes are measured as percentage deviations from 1913 parity. "Real Value" means purchasing power, or command over commodities in general, at wholesale.

Heavy bars have been used for commodity groups which in October, 1931, were below 1913 parity in purchasing power per unit, while open columns have been used for commodity groups which in that month were above 1913 parity. Although there was a reversal of positions among certain groups in earlier years, the heavy and the open columns have been used throughout to represent the same groups as in October, 1931.)

which have occurred during the present recession. Raw materials, particularly raw farm products and those industrial raw materials which are subject to a considerable manufactured g[illegible] declined materially in real value. vailable, it has ce[illegible] value per unit, while non-foods gained in terms of commodities in general, than in 1913, while an average unit of manufactured goods was worth 9 per cent more. Those raw products which furnish the [illegible] materials of industry, and which are subject to a relatively high degree of fabrication, have fallen to a level of real value 30 per cent below that of 1913. Raw farm products, at wholesale, have declined to a level 25 per cent lower than that of 1913, a level substantially lower than that reached in 1921.[10].

The current recession has involved only a slight change in the relations prevailing between producers' and consumers' goods in 1929, but these relations were far from pre-war parity. The post-war economic advance was made under conditions in which goods ready for consumption were worth more in terms of commodities than in 1913, while producers' goods as a broad class were worth less. The flow of goods to consumers and the general state of prosperity of the decade of the twenties do not seem to have required a cheapening of consumption goods, in relation to other commodities.[11]. The free movement of goods under these conditions was sustained through the maintenance of the purchasing power of important consuming classes at higher levels than in pre-war days. The incomes of industrial wage-earners, of important groups of salaried employees and of those drawing dividends from corporate undertakings were substantially higher during this decade than in the years immediately preceding the war.

The price movements of producers' and of consumers' goods are of particular interest in their bearing on the course of production and consumption. The following index numbers measure changes in the real value of various types of goods falling within these two broad categories.

TABLE 6

Changes in Purchasing Power, per unit, between 1913 *and October,* 1931, *of different Classes of Producers' and Consumers' Goods*

Commodity Group	N[12]	Index Numbers of Purchasing Power								
		1913	1919	1920	1921	1922	1928	July 1929	Oct. 1930	Oct. 1931
Producers' goods	285	100	98	100	95	97	95	95	92	93
Raw	107	100	96	88	78	86	91	88	79	74
Processed	178	100	100	108	107	104	98	99	101	107
For human consumption	130	100	104	96	82	88	90	87	77	71
For capital	155	100	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

general level up 23 per cent, and after a five-year advance amounting to 142 per cent. The level from which the decline started was not one which bore any of the aspects of permanence. The relations among different elements of the price structure which existed in May, 1920, had prevailed for only a short time. Flux had been the outstanding feature of the recent past. There had been no consolidation of the economic positions of different economic groups, no making of long-term commitments on the basis of existing prices. As a result, when once the price decline was well under way the barriers to liquidation which are offered by a thoroughly consolidated position and a sense of permanence in commodity values were relatively weak. Within the eleven months of sharpest decline the drop amounted to 44 per cent, and the rate of decline per month averaged 5.1 per cent. Price recession was intense, but the violent change was concentrated within a period of less than a year.

Sharply different was the creeping, persistent illness which began in July of 1929. During eight years of but slight change in the general price level that consolidation of position which was absent in 1920 had been effected. New price relations had been established during these years, new wage policies had been accepted, enduring commitments had been made, and a sense of the permanence of the existing level of commodity values had been built up. All these conditions constituted barriers to a downward readjustment of commodity values, barriers which were particularly strong in industries with high overhead costs or with relatively heavy labor charges. There were forces, of course, which maintained pressure on commodity prices between 1929 and 1931, but the relative slowness of the decline—1.3 per cent a month, as against 5.1 per cent during the stage of sharp liquidation in 1920-21—reflects in considerable part the continuing presence of obstacles to liquidation which did not exist in comparable degree at the time of the earlier break.

During severe price recessions all commodity groups suffer, whether their relative position be strengthened or weakened as a result of the change. Subsequent economic developments, however, are materially affected by the character of the price readjustment occurring during [illegible] general recessions. The drop of 1920-21 [illegible] red goods over-valued, in terms of [illegible] and raw material under-valued; it left [illegible] goods under-valued and consumers' goods Produced; it left agricultural products with low pur- 1928 fo power, per unit, and non-agricultural products products ha urchasing power. The present recession, like parity. Ra 0-21, has materially cheapened agricultural and produ aw materials generally, and producers' goods pre-war re r ultimate human consumption. It has ensumers' g real value per unit of non-agricultural prosame stan of manufactured goods. Although the figures lapping ar available, it has certainly increased important

Raw ma manufacturing costs, per unit of product during the g measured in terms of constant dollars). average un has increased the real value, in terms of other

9 — In gener , of processed consumers' goods, a group materials been consistently high-priced during recent 20 per c ese various groups are not, of course, mutually exclusive). At present prices goods in shape for consumption and use by individual consumers are worth 11 per cent more, in terms of general commodities, than they were in 1913. Highest in price among these goods are non-foods, which have been particularly insensitive to the drop in general prices. These stood in October, 1931, 27 per cent above their 1913 values and 13.7 per cent above their July, 1929, values.

The immediate significance of such changes in prices and in purchasing power is brought out by the following comparison. Between October, 1929, and October, 1931, aggregate factory payrolls, as measured by the revised index of the Federal Reserve Board, declined 47 per cent. The prices of processed consumers' goods, at wholesale, fell 26 per cent during the same period. This means that the volume of such goods that could have been sold to industrial wage-earners if they were buying at wholesale (without change in the proportion of their incomes expended for such goods) declined approximately 28 per cent during this 24 month period. If the cost of living index be used in this comparison, the drop in volume of potential sales is materially greater, amounting to 36 per cent.

The chief problem posed by these conditions is how the flow of goods to consumers is to be maintained, and stimulated, with the real or commodity value of raw materials so low, in comparison with earlier standards, and with the real value of consumers' goods so high. After the depression of 1921 the economic advance was resumed without a complete restoration of pre-war relations among the different elements of the price system. The solution of that problem was facilitated by an extraordinary and unprecedented increase in industrial productivity—an advance of 13.5 per cent in physical output per wage-earner between 1921 and 1923, on top of an increase of 3.0 per cent between 1919 and 1921. The aggregate purchasing power of agricultural producers and of producers of certain other raw materials remained low, but this remarkable gain in industrial productivity with a concurrent growth in physical volume of production, and the marked price advantage enjoyed by manufacturing producers after 1921 permitted a great advance in the aggregate purchasing power of industrial wage-earners and of other groups drawing their incomes from manufacturing industries. The increased purchasing power of these groups and the opening up of new foreign markets more than compensated for the low purchasing power of agricultural producers. These conditions permitted the initiation of revival and the resumption of the movements of goods to consumers in normal volume, even though such goods were relatively high-priced. Today's price situation is that of 1921 in aggravated form. The conditions of economic recovery in the present instance remain to be determined.

On the price side there are three clear-cut alternatives. One is a resumption of activity under existing price conditions, conditions marked, essentially, by relatively high prices to consumers and by relatively low prices for the raw materials on which the incomes of important consuming groups depend. Another alternative is continued liquidation of the prices of manufactured goods, particularly those intended for human consumption, until

something approaching pre-recession parity with raw materials is restored. A third alternative is the restoration of more satisfactory terms of exchange between these two broad classes of goods through advances in the prices of materials, rather than through further liquidation of manufactured goods.

The first is not an impossible alternative. The shattering of established price relations is not a necessary barrier to economic recovery. A modern economic system functions not under one rigorously prescribed set of conditions, but may adapt itself to a variety of alternative situations. (The process of adaptation may, to be sure, be slow and painful.) Adaptation to altered price relations which might be adverse to prompt revival may be facilitated by favorable conditions elsewhere in the economic system, as was the case during the recovery of 1921-22. But such favorable conditions — rapidly enhanced productivity, highly favorable opportunities for expansion in foreign markets, the exploitation of a novel credit mechanism — may not be surely counted upon to play their part again. In default of such developments the persistence of existing price inequalities, with their accompaniment of low purchasing power among domestic agricultural producers and among important foreign producers of raw materials, may exercise a continuing adverse influence upon business recovery.

Further liquidation of the prices of manufactured goods is another possibility offering one means of restoring the deficient purchasing power of large groups of consumers. To date, raw materials have lost close to 40 per cent of their 1929 value, per unit (in terms of current dollars), while manufactured goods have lost approximately 25 per cent. If parity is to be restored through reduction of the prices of manufactured goods until this gap is bridged, further rigorous deflation is necessary. Extensive wage and salary reductions will be inevitable; a further writing-off of investment values, with all that that implies, will be unavoidable; all the innumerable readjustments of debtor-creditor relations and of other economic relations which drastic changes in the general level of prices involve will be required, in intensified degree. Nor can we be sure that a reduction of the prices of manufactured goods to a level 40 per cent below that of July, 1929, (and some 15 per cent below that of 1913) will attain the required end. For in the meantime continuing economic distress may well force lower the level of raw material prices—and the pursuit will begin again. Recovery of the most seriously depressed prices offers another means of regaining a status favorable to a freer flow of goods and services. The severe strains of liquidating further the prices of manufactured goods and of services would be largely avoided by a strong recovery of this sort. Even the beginning of such a movement would restore some of the lost purchasing power of raw material producers, for these goods react promptly to changes in monetary values and to the stirring reviving activity. The benefits of the readjustment would not have to wait upon the completion of the movement.

This last method of attaining conditions of reco after depression was the one which prevailed, without meditation, during the quarter century preceding the crisis. The persistent, underlying force of a long- advance in the level of prices operates to stimulat covery, after depression, among raw materials, produc goods, and those other groups which are most sensit to changes in monetary conditions. Some liquidat among fabricated goods there must be at such times, l the upward push of prices, affecting most immediat the commodity groups which suffer most severely in t cyclical drop, shortens and softens the downward revisi of values and costs among the tardy elements of the pri system.

There is no present evidence that the rising trend c prices which characterized the pre-war era has persiste The record of the last decade indicates, indeed, that a reverse movement may be under way. If this be true th force of the long-term movement, which tended to pro long phases of prosperity and to curtail liquidation and ameliorate its pains, may be expected to operate in the opposite fashion, prolonging liquidation and intensifying its difficulties. Prices of commodities among the groups which are most sensitive to the forces of cyclical recession may be further depressed through the persistent push of the long-term factor. The fortuitous aid afforded by the secular movement in pre-war days would under these conditions be replaced by a fortuitously depressant factor.

There was much to justify a policy of dependence upon the processes of natural recovery when the rising trend of prices was thus tending to curtail the period of liquidation and to alleviate its pains. It is a policy which is harder to defend when this assistance has been withdrawn, when, in fact, this external force may be working to retard those readjustments which conduce to revival. Under these conditions, and in the face of such wide price discrepancies as have developed during more than two years of liquidation, the possibility of positive action may well be explored.

The establishment of conditions favorable to recovery will doubtless involve changes of the three types suggested as alternatives; as regards the price structure as a whole they are not mutually exclusive. To some extent there will be adaptation to price relations quite different from those of the pre-recession period. To some extent there will be further [illegible] in the construction of the prices of finished goods and of consumers' goods, with accompanying wage cuts and writing-down of investment values. To some extent earlier relations will be restored, or approximated, through enhancement of the values of the goods now most seriously depressed. The relative importance of each of these types of change will depend, in part, upon the conditions of production and upon the state of the market for goods of different types. But economic policy, deliberately formulated and actively enforced, may also play a part in determining the degree to which each of these modes of establishing the conditions of recovery may prevail.

National Bureau of Economic Research

JUNE 30, 1933

BULLETIN 47

51 MADISON AVE., NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

GOKHALE INSTITUTE OF POLITICS AND ECONOMICS POONA 4

EMPLOYMENT DURING THE DEPRESSION

Copyright 1933, National Bureau of Economic Research, Inc.

Meredith B. Givens

THE IMPACT of the depression on the individual earnings of those workers who have retained employment has been revealed by an analysis of wage changes in the preceding *Bulletin* of this series. The present article is confined to an analysis of the cumulative shrinkage in those lines of employment for which fairly satisfactory data are available. For this purpose average annual figures are more useful than the monthly figures—hence no description of the monthly changes in employment is presented at this time. As this *Bulletin* goes to press there is evidence of a definite lift in employment which may prove to have more than a delayed seasonal significance, but these current changes are not described here.

Current employment figures in the major occupational or industrial groups are incomplete in coverage and uneven in quality. Utilizing the two basic sources of information—the federal Census and the monthly reports of the United States Bureau of Labor Statistics—it is possible, with varying degrees of accuracy, to compute the trends in employment for groups aggregating more than twenty million workers, comprising somewhat less than two-thirds of the total number of non-agricultural employees among the forty-eight million gainfully occupied persons in the United States.

For groups not covered in the tables information is scanty and unreliable or entirely lacking. Among the "known" groups the figures for manufacturing and steam railroads are by far the best. For mining, public utilities and communications they are reasonably good. For trade, finance, selected services and construction and raw materials the monthly returns are small and somewhat inconclusive, yet sufficiently indicative to reveal approximate trends. For the service occupations generally, for water, automotive and air transport, and for other important miscellaneous lines no current trends can be determined. Nor is it possible to determine the number on the public payrolls, except in the federal civil service whose average increased from 587 thousand in 1929 to a peak of 613 thousand in 1931, holding to a level of 609 thousand in 1932 prior to the heavy cuts initiated and in prospect under the new administration. Those engaged in public service occupations identifiable in the Census aggregated 700 thousand in 1930, whereas an independent estimate has placed the total number so employed at about two and three-quarter millions in that Census year.[1] That the public payroll (exclusive of public works) has been diminished during the depression is probable, but no direct measure of the change is available.

Employment by Major Industry Groups

Table 1 presents for principal groupings the shrinkage in employment during the depression, in both relative and absolute numbers. The various industries are arranged according to their relative resistance to depression as shown by the 1932 levels of employment as compared with those of 1929. These figures make no allowances for part-time employment.

This array reveals clearly the greater stability of the financial, clerical, public utility and service employments (Group A) as compared with the industries engaged directly in the production and physical movement of raw materials and commodities (Group B). Based upon returns from a substantial number of relatively small institutions the figures for real estate and the financial employments are indicative of the high degree of security of the employed personnel of these organizations. Meanwhile the closing of several thousand banks has had an undetermined effect, temporary or permanent, upon the total number employed by the financial institutions of the country. Aside from the financial employments the power and light industry heads the list for stability of operation and employment. Employment in these utilities has undergone approximately the same rate of shrinkage as has the production of electric power during the same period. With declines in the volume of traffic the telephone and telegraph workers were harder hit than the power and light companies. The drop in the services (laundries, dyeing and cleaning, hotels) has been fairly uniform as between the different groups. The marked falling off of numbers in the electric railway industry is no doubt due to the continued competition of automotive transportation with the trolleys, as well as to the depression.

Taken as a whole, Group A shows a cumulative decline of from twenty to twenty-five per cent since 1929, whereas Group B carries barely half of its former workers on its payrolls. It must be remembered, of course, that employ-

[1] Estimated by R. G. Hurlin. See Hurlin and Givens in *Recent Social Trends* (New York, 1933), Ch. VI, p. 290.

TABLE 1

EMPLOYMENT BY MAJOR INDUSTRY GROUPS, 1929—1933 (a)

Industry	Index Numbers Monthly average 1929 = 100					Estimated Total Number Employed (in thousands)	
	1929	1930	1931	1932	1933(b)	1929	1932
GROUP A							
Banks, Brokerage, Insurance, Real Estate	100.0	(c)	(c)	98.5(d)	97.0(d)	(c)	(c)
Power and Light	100.0	103.0	95.6	83.0	77.3	287	238
Dyeing and Cleaning	100.0	(c)	92.7	81.4	73.6	99	80
Retail Trade	100.0	95.9	89.4	80.9	75.1	4,032	3,262
Laundries	100.0	(c)	89.4	80.1	74.4	285	228
Telephone and Telegraph	100.0	97.9	86.6	79.1	73.5	558	441
Hotels	100.0	99.2	91.7	79.0	73.0	314	248
Wholesale Trade	100.0	96.0	86.6	78.2	74.2	1,605	1,255
Electric Railroads	100.0	93.4	84.7	75.5	70.3	190	143
GROUP B							
Anthracite Coal	100.0	92.2	73.7	61.5	54.4	112	69
Steam Railroads (Class I)	100.0	89.1	75.4	61.8	56.5(c)	1,670	1,032
Manufacturing	100.0	86.8	73.6	60.9	57.2	8,839	5,448
Crude Petroleum Production	100.0	87.4	65.7	55.3	56.9	189	105
Bituminous Coal	100.0	85.6	65.4	52.2	53.4	359	188
Quarrying and Non-Metal Mining	100.0	84.3	67.4	49.0	36.1	86	42
Metalliferous Mining	100.0	83.2	59.1	36.5	30.8	119	43
Building Construction	100.0	91.8	60.0	34.0	23.0	2,209	752
TOTALS							
Group A (b) (e)	100.0	96.5	88.8	80.0	74.6	7,370	5,895
Group B (e)	100.0	87.9	71.1	56.0	51.1	13,583	7,679
All Industries (f) (e)	100.0	91.6	77.3	64.5	59.3	20,953	13,574

(a) Not including reductions in working hours among those still employed.
(b) Four months.
(c) Not available.
(d) These figures probably underestimate the extent of the actual drop in employment.
(e) Two months.
(f) Omitting Banks, Brokerage, Insurance, Real Estate.
(g) Weighted average.

ment in 1929 reflects an abnormally high rate of industrial activity.

There is a remarkably close correspondence in the extent of the employment decline in transportation and in manufacturing, but both lines fared better than the extractive industries and construction. The tremendous drop in metal mining reflects the virtual stagnation of the iron and steel industry and the metal trades. The coal figures represent the dilution of employment in an already demoralized industry.[2]

Most amazing of all is the current drop in construction to a low point at less than twenty-five per cent of the 1929 employment level. The heaviest losses have occurred, of course, in those employments in Group B in which the largest number of employees are clustered, especially in manufacturing and construction. Manufacturing has suffered a net loss of over three million workers, while of the five million remaining many are on part time. If the indicators of employment and of building activity are to be relied upon, fully seventy-five per cent of the building tradesmen employed in 1929 were unable to find work in their regular trades in the first quarter of 1933. It should be noted that the figure for the first quarter of the current year reflects the inactivity of the winter season in addition to the depressional factors. The employment indexes for construction should be used with caution since the reporting is not yet adequately representative of the industry.

[2]Compiled from U. S. Bureau of Mines figures. Employment figure obtained by dividing average daily output in tons by net tons mined per day per man.

EMPLOYMENT CHANGES WITHIN THE MANUFACTURING INDUSTRIES

Comparison by Geographic Districts. Table 2 shows that the employment shrinkage in manufacturing has been unevenly distributed among industrial districts, though severe in all. Factory employment in the South Atlantic states has been maintained far better than in any other district, but the number of industrial workers is small in this already depressed agricultural area. In the agricultural areas of the West North Central, too, the drop in manufacturing employment has been relatively less than in the more heavily industrial districts. Among the industrialized states employment has shown greater tenacity along the eastern seaboard with its concentration of population and wealth (the mid-Atlantic and New England regions) than in the East North Central area which includes the growing cities of the Great Lakes and northern Mississippi basin. In the East- and West-South Central districts almost half of the small number of employees have been dropped from the payrolls of the small manufacturing plants of these non-urbanized sections. In the Mountain states still a smaller proportion, less than half, have remained on the rolls.

Except in the South Atlantic states the scanty industrial population of the agricultural states has sustained a heavier degree of depressional displacement than have the greater number of factory employees in the eastern industrial district. The latter has fared better, however, than the industrial mid-west. The relative severity of the industrial

TABLE 2

EMPLOYMENT IN MANUFACTURING BY GEOGRAPHIC DISTRICTS, 1929—1933 (a)

District (b)	Indexes of Employment Monthly average 1929 = 100					Estimated Total Number Employed (in thousands)	
	1929	1930	1931	1932	1933 (c)	1929	1932
South Atlantic	100.0	90.4	80.9	72.8	72.1	912	665
West North Central	100.0	90.4	77.0	66.0	62.0	474	313
Mid-Atlantic	100.0	87.1	76.7	62.9	57.8	2,562	1,611
New England	100.0	83.3	77.4	61.8	57.1	1,099	679
East South Central	100.0	83.3	69.4	58.7	54.3	378	222
West South Central	100.0	85.4	67.1	57.6	55.9	298	172
Pacific	100.0	85.0	70.0	56.7	50.0	471	267
East North Central	100.0	82.0	69.1	56.1	51.4	2,542	1,427
Mountain	100.0	88.8	68.4	45.0	36.8	102	46

(a) Not including reductions in working hours among those still employed.

(b) *South Atlantic*—Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia; *West North Central*—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota; *Middle Atlantic*—New Jersey, New York, Pennsylvania; *New England*—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont; *East South Central*—Alabama, Kentucky, Mississippi, Tennessee; *West South Central*—Arkansas, Louisiana, Oklahoma, Texas; *Pacific*—California, Oregon, Washington; *East North Central*—Illinois, Indiana, Michigan, Ohio, Wisconsin; *Mountain*—Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming.

(c) Three months only.

depression in the rural states is dwarfed in the midst of the vaster depression in agriculture, and the displaced industrial workers of these regions are swallowed up amid the hardships of the outlying population.

For the industrial as against the agricultural states as a whole, however, employment shrinkage in manufacturing has been most serious, both in absolute and relative terms, in the predominantly industrial areas of New England, the Mid-Atlantic and the East North Central. These three combined show from 1929 to 1932 an absolute shrinkage of 2,487 thousand persons and a relative drop of 40.1 per cent. In the rest of the country, the absolute shrinkage was 952 thousand persons, a percentage decline of 36.1. Some of the regional differences in manufacturing may be due to differences in the character of the activities, that is, relative proportions of capital and durable goods, and of non-durable consumption goods in total output.

Comparison by Individual Industries. Within the manufacturing group there has been a marked unevenness in employment trends during the depression. F. C. Mills in his recent study, *Economic Tendencies in the United States*,[8] has emphasized the greater instability of the durable goods industries as compared with those producing relatively perishable goods or products destined mainly for direct use by individual consumers. This contrast is again revealed by the comparative employment records of individual manufacturing industries during the current depression. Table 3 shows in striking fashion the comparatively good performance of the food, leather, printing, tobacco and textile industries, while the heavier industries have trailed behind both in the earlier and later stages of depression. The machinery industry held its own relatively well during the first year of depression, but the severe declines in 1931 and 1932 reflect the general inactivity in the manufacture of productive equipment and the accumulating obsolescence of capacity during the later phases of depression. Lumber, cement, clay, glass, and structural steel as a factor in the basic iron and steel industry, are pulled down to low levels by the virtual stagnation of the construction industry. An inclusive measure of the effect of construction demand in industrial production is furnished by the Federal Employment Stabilization Board's index of employment in the production of six major construction materials. This index, upon a 1929 base, drops to 83.6 in 1930, to 66.1 in 1931 and to a low of 44.3 in 1932, representing a cumulative layoff of over one hundred and fifty thousand workers.

TABLE 3

EMPLOYMENT IN MANUFACTURING BY MAJOR GROUPS, 1929—1933 (a)

Industry	Indexes of Employment Monthly average 1929 = 100				
	1929	1930	1931	1932	1933 (b)
Food Products	100.0	95.0	88.8	82.2	78.2
Leather and Products	100.0	91.7	85.5	86.6	80.8
Paper and Printing	100.0	97.1	89.3	80.0	76.5
Tobacco Manufactures	100.0	95.4	86.6	76.1	66.0
Textiles and Products	100.0	87.4	80.4	70.1	71.9
Chemicals and Products	100.0	93.1	79.3	68.5	68.7
Rubber Products	100.0	76.4	66.4	59.8	50.3
Iron and Steel	100.0	88.1	72.5	56.6	50.8
Transportation Equipment	100.0	80.4	63.8	51.7	47.1
Cement, Clay, Glass	100.0	84.4	68.9	50.8	41.9
Non-Ferrous Metals	100.0	77.3	63.9	49.8	43.5
Machinery	100.0	83.9	62.4	44.8	37.6
Lumber and Products	100.0	78.3	59.2	43.9	37.4
Total	100.0	86.8	73.6	60.9	58.1

(a) Based on Federal Reserve Board indexes. Not including reductions in working hours among those still employed.

(b) Three months only.

RELATIVE DECLINES IN EMPLOYMENT IN TWO DEPRESSIONS

For manufacturing and steam railroads it is possible to compare the employment experience of the current depression with that of 1921. The short, sharp character of the earlier depression is manifested in the more severe drop in manufacturing employment in 1921 to 76.4 per cent of the preceding year, followed by steady recovery. In the current depression two years were required for factory employment to drop to the 1921 level relative to the pre-depression year, while the decline has been still more rapid during the third year of unemployment.

[8] Published by the National Bureau of Economic Research, 1932.

TABLE 4

RELATIVE DECLINE IN EMPLOYMENT IN TWO DEPRESSIONS, 1920-1922 AND 1929-1932[a]

Index Numbers (Base Years = 1920 and 1929)

Manufacturing				*Steam Railroads*			
1920	100.0	*1929*	100.0	*1920*	100.0	*1929*	100.0
1921	76.4	*1930*	86.8	*1921*	82.5	*1930*	89.1
1922	83.6	*1931*	73.6	*1922*	81.7	*1931*	75.4
1923	96.5	*1932*	60.9	*1923*	93.4	*1932*	61.8

(a) Not including reductions in working hours among those still employed.

For steam railroads the immediate drop in employment was less marked than for manufactures in both depressions. However, in 1921-22 the employment shortage was more sustained for steam railroads than in manufacturing, and for both groups relatively more severe in the first year of the earlier depression than in 1930.

UNDER-EMPLOYMENT AND STAGGERED WORK

An unprecedented phase of this depression has been the widespread resort to staggered work schedules which have taken the form of short days, short weeks or other varieties of irregularity and dilution. These practices have been encouraged by the "share-the-work" campaigns. The extent of part-time work is not revealed by employment figures drawn from returns showing the total number of persons on payrolls during some specified period of the month. Statistics of actual man-hours worked furnish the most sensitive indicator of employment changes, and can be related to the number of employees on payrolls to reveal the volume of that "unemployment within employment" which eludes ordinary methods of estimate. Unfortunately the statistics of man-hours are not yet well developed. The best measure of part-time employment can be derived from returns from representative firms in twenty-five industries as compiled by the National Industrial Conference Board. Drawn from this source, comparisons between the depressions of 1921 and of 1930-32 are given in Table 5. The tremendous drop in working hours during the past three years is contrasted sharply with the slight average reduction in working time for 1921. If we assume that all workers in manufacturing industries were employed only three-quarters time in 1932, as the Conference Board figures indicate, then net employment in manufacturing in 1932 sank to forty-five per cent of the 1929 level. As to the extent of under-employment in other groups we can only guess, in the absence of data.[4]

[4]The method of computing employment for coal mining in Table 1 has made a minimum allowance for irregular work in the mines.

TABLE 5

CHANGES IN WEEKLY HOURS OF FACTORY WORK IN TWO DEPRESSIONS, 1920-23 AND 1929-1932 (a)

Year	*Average Actual Hours Per Week*	*Index 1920=100*	*Year*	*Average Actual Hours Per Week*	*Index 1929=100*
1920	48.2	100.0	*1929*	48.4	100.0
1921	45.6	94.6	*1930*	44.0	90.0
1922	49.2	102.1	*1931*	40.3	83.3
1923	49.1	101.9	*1932*	34.9	72.1

(a) Based on figures for twenty-five manufacturing industries published by the National Industrial Conference Board.

EMPLOYMENT SHRINKAGE AND UNEMPLOYMENT

It will be noted that the shrinkage in employment in the seventeen "known" groups shown in Table 1 has reached an aggregate approaching eight million in the spring of 1933. It must not be inferred that this shrinkage in the number on industrial payrolls measures the volume of unemployment, although it may be the leading factor therein at such a time as the present. In the current state of our statistics the approximate measurement of unemployment in the United States requires an estimate of the margin between the total supply of labor and actual employment. This necessitates careful estimates of employment in the "unknown" categories of gainful work, as well as painstaking calculations in determining the probable total number of persons who are "gainfully occupied" or "attached" in each group of industries.[5] Utilizing the various available methods a detailed analysis of changes in employment and unemployment is now in progress at the National Bureau.

Today it is seriously questioned whether the recovery of pre-depression production levels can bring reemployment of existing "reserves" of labor in existing major industries, especially in those enumerated under Group B in Table 1 of this *Bulletin.* In all probability most existing industries can now produce at former levels with fewer men than they have hitherto employed. The disposition of industrial workers released from their accustomed lines of work is one of the grave problems confronting the program of immediate recovery. Whether the release from these industries has created a transitory or a permanent and growing problem only the longer future will show.

Yet it is a mistake to refer to current displacement as "technological unemployment" in accordance with the prevalent jargon. Brief consideration of the larger background of these changes will reveal a persistent confusion of thought in the common use of this term. The concept presumes a relationship between two independent phenomena—*technological change* and *unemployment.* Technological change is a physical fact, whose effects are statistically measurable, characteristically resulting in reduced labor requirements in production. The facts of changing productivity have been brought out in previous National Bureau studies and elsewhere. In computing changes in productivity the statistics of labor time represent direct operating labor in most instances (for these figures are most readily obtainable)—although in the more general studies, both the direct and indirect labor applied in the particular processes under review are included. Usually the salaried and office workers are not counted, and statistics are not available to cover the labor expended in transporting, financing and selling the product. No allowances are made for changes in the number of workers required in commerce and finance, without

[5]Cf. *Recent Economic Changes* (National Bureau of Economic Research, 1929), Vol. II, pp. 466-78.

whose services the output of industry would find no outlet and would fail to reach the ultimate consumer.

Meanwhile, it remains to be seen whether newly rationalized industries will appear after this depression to absorb larger labor forces than ever, as improved technique lowers costs and selling prices. There is little solid basis for prediction in these matters. Whether production and consumption will increase to maintain or augment employment in a progressive industry depends upon the price policy, the elasticity of demand for the product, the foresight and efficiency of management, the general competitive situation, governmental policy and a host of other factors in addition to the rate of productivity. This is true for industry as a whole as well as for single industries.

Technology, then, is only one cause of reduction in labor time per unit of product. Changes in consumption habits and shifts in market demand may have a dislocative effect on employment similar to that of increased productivity. To make the transition from technological change to unemployment requires assumptions regarding a series of relationships between production, prices and alternative employment opportunities, so that work shortage, if it results, becomes not "technological" but a part of that general unemployment which arises from permanent changes in the structure and organization of industry. The current unemployment should be regarded as "depressional" rather than "technological," due to a complex of factors among which technological change represents an important but not a clearly differentiated element.

Conclusions

Since 1929 employment in the financial, clerical, public utility and service lines has manifested greater resistance to depression than in the underlying industries engaged in physical production and transport. Transportation and manufacturing have fared better than the extractive industries, while construction has suffered most severely of all.

In manufacturing, the eastern seaboard generally has fared better, relatively, than the inland districts. Industrial employment in the agricultural states has suffered heavily, but less heavily in general than in the industrial states of the mid-west. The durable goods industries, always less stable than those producing more perishable commodities, have experienced severe declines, while foods, leather, printing and textiles have shown greatest resistance among the major groups. The slump in construction and in rail traffic has had serious effects in the manufacturing industries.

In manufacturing and in the railroad industry the present depression has set in more slowly but has had a more disastrous cumulative effect on employment than the relatively drastic but short-lived decline of 1921. By 1932 the part-time work schedules in manufacturing had reduced existing employment to two-thirds of the average working week of 1929, whereas the dilution of employment in 1921 was inconsequential.

Employment shrinkage must not be confused with volume of unemployment, though the employment decline of the current depression is the most significant single indicator of unemployment. The term *technological unemployment* is probably a misnomer, but *technological displacement* is real enough, taking the form of a shift in the type of worker required in a given industry, bringing about temporary or permanent reduction in the number of workers required, or perhaps affecting the identity of the employed without affecting their number. It is possible that reduced employment in many existing lines may be revealed as permanent following this depression. In that event, new types of private and public enterprise must develop or be stimulated in combination with plans for shorter hours, earlier compensated retirement and various devices to reduce at the margins the numbers of those normally seeking gainful employment.

Meredith B. Givens, who is Secretary for Industry and Trade of the Social Science Research Council, has been associated with the National Bureau of Economic Research in various tasks since 1925. For a time he was a special investigator for the United States Bureau of Labor Statistics, and he has conducted labor market studies under other auspices. At present he is actively associated with the newly organized Committee on Government Statistics and Information Services in Washington, and is a member of the special advisory committee which has been invited to conduct a thorough examination of the statistical work of the United States Department of Labor.

ECONOMIC TENDENCIES IN THE UNITED STATES

Economic Tendencies in the United States, Aspects of Pre-War and Post-War Changes, by F. C. Mills, appears on the American Library Association List of Forty Notable Books of 1932. The list is compiled annually from ballots of librarians, critics and university professors, and represents their opinion of what books published during the year have permanent value for American libraries.

Dr. Mills' volume was also recommended by Henry Hazlitt, in his discussion with Louis Fischer on "The Depression and the Profit System" (*Nation*, May 24, 1933) as a main textbook for an intensive study of the period 1922-29. He characterizes the volume as a "thorough and meticulous study" and quotes certain findings.

SEASONAL VARIATIONS IN INDUSTRY AND TRADE

From *Dun & Bradstreet Monthly Review:* "Simon Kuznets' study of seasonal variations is accurate and comprehensive. Evidence of painstaking exactitude in the preparation and presentation of material is abundant. Yet this care, rather than interfering in any way with the readability of the thesis, imparts to it a precision and clarity which makes it vitally interesting.

"Because of the wealth of statistical material and supplementary data the book has definite, practical value to the average reader as well as to the specialist."

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

H. W. Laidler, *Chairman of the Board* — Joseph H. Willits, *Vice-President*
Oswald W. Knauth, *President* — George E. Roberts, *Treasurer*
Charles A. Bliss, *Executive Secretary*

Research Staff

Wesley C. Mitchell, *Director of Research*
Simon Kuznets — Frederick C. Mills
Frederick R. Macaulay — Willard L. Thorp
Leo Wolman

Directors At Large

Oswald W. Knauth — George O. May
H. W. Laidler — Elwood Mead
Shepard Morgan — George Soule
L. C. Marshall — N. I. Stone
Matthew Woll

Directors By University Appointment

Edwin F. Gay, *Harvard*
Walton H. Hamilton, *Yale*
Harry Jerome, *Wisconsin*
Harry Alvin Millis, *Chicago*
Wesley C. Mitchell, *Columbia*
Joseph H. Willits, *Pennsylvania*

Directors Appointed By Other Organizations

Hugh Frayne, *American Federation of Labor*
David Friday, *American Economic Association*
Lee Galloway, *American Management Association*
George E. Roberts, *American Bankers Association*
M. C. Rorty, *American Statistical Association*
A. W. Shaw, *National Publishers Association*
Robert B. Wolf, *American Engineering Council*

A PLANNING CONFERENCE

On June 1 the research staff and special investigators of the National Bureau met with the Executive Committee and other immediately available Directors for the purpose of reviewing the National Bureau's program as a whole. Mr. Knauth presided and introduced the question of the adaptation of National Bureau activities to the needs and demands of the times. The discussion was then opened by Dr. Mitchell. Foremost among the subjects considered was the attitude the National Bureau should adopt towards the pressure for investigations of immediate utility in the formulation of programs of social welfare. Today precedents are being set. The national government is embarking on experiments and acting with new vigor as an agency for the control of economic conditions. While a reaction may occur against the extent of this activity, the nation cannot go back to where it was. The demand for research work is increased as well as redirected by the novel operations of government. And due account must be taken of the responsibility which this situation creates for agencies like the National Bureau.

At the same time the National Bureau must safeguard its own specific task. It has its distinctive and unique character, as revealed by the definition of its purpose in its charter, by the constitution of its Board of Directors, and by its regulations regarding publication which ensure that the final product in each case represents not only the careful work of specialists but also the critical judgment of the Directors. The National Bureau takes the stand that every determination of policy should be based on the impartial discovery and analysis of the essential and relevant facts. It has engaged largely in studying those aspects of controversial problems which are susceptible of scientific investigation. Without advocating any line of action, the National Bureau can present the facts which must be considered regardless of the solution adopted. Indeed, it was felt by those at the conference that the National Bureau should continue to devote the major portion of its attention to the compilation and analysis of the data which are ultimately requisite for economic planning, public or private, systematic or partial. It is particularly fitted for this task since there are many gaps in data which only a skilled staff such as its can fill.

A body that devotes itself so largely to quantitative analysis as does the National Bureau must keep in mind the consideration that statistical measurements are not in themselves economic facts. Every economic fact is the expression of a relationship between a given item and the situation in which it occurs, and the fact is not properly stated until it is referred to the total situation of which it is an index. Furthermore, we should not confine ourselves to the study of single problems in isolation. Although factors must often be scrutinized separately for a time, they must presently be regarded as parts of a larger interrelated whole. The interdependence of its parts is one of the outstanding characteristics of the economic system. The maintenance of the relations among parts of the whole economic organism must be kept ultimately in view in every partial investigation we undertake. In this way, and by stressing the practical bearings of the findings of each piece of research, we can contribute towards the development of a real economic science in a form that will make it of genuine use in economic practice and in designing solutions with an increasing measure of success.

The concensus of opinion at the meeting was that the National Bureau should keep its most important statistical series up to date, releasing new figures from time to time, and that it should welcome any attempt to develop a clearing-house service in the field of economic investigation and do its share in coordinating economic research, cooperating whenever feasible with other agencies.

The National Bureau program, including projects which have been suggested as within its province, may be outlined as follows. Obviously, to carry out even the projects which seemed to those present at the conference of primary importance would require considerable resources in addition to those necessary for the completion of the investigations already in progress. But for efficient coordination long-range planning is requisite. Consequently, the new projects suggested are grouped with those actually in progress under the four major divisions into which National Bureau investigations may conveniently be classified.

A. The NATIONAL INCOME AND ITS DISTRIBUTION, one of the National Bureau's primary undertakings, has four aspects:

1. Estimates of total income by industrial sources
2. Forms of payment—wages, income from ownership, and profits
3. Distribution of personal incomes
4. Consumption and saving.

Dr. Kuznets is engaged at present in revising and extending Dr. King's estimates of national income classified by industrial sources and forms of payment. This work, for the years 1929-32, is being carried through in cooperation with the Department of Commerce. It is planned that he will proceed to an examination of the distribution of personal incomes by size and to a study of the adjustment of income estimates for changes in the cost of living of the various income classes.

To supplement Dr. Wolman's study of wages, related to the second aspect, a history of wages in the United States was proposed. Also that income from ownership—dividends, interest, rent and profits—should be studied intensively.

Under the fourth aspect, the use of incomes, are included the subjects of standards of living, capital formation, and the government's activity. Of these, only one aspect is now being studied, that of capital formation as evidenced by the production of capital goods. To supplement this investigation by Dr. Kuznets, four other topics directly related to this problem were suggested: savings by business enterprises and by individuals; the mechanism for the investment of savings; the rate of return on invested capital, with full account taken of investment losses; and finally the obsolescence of corporate securities.

Three new projects were recommended under the heading of standards of living: a history of economic welfare in the United States, the costs of social insurance, and consumers' credit and its relation to consumers' incomes.

Under the third topic included under the uses of national income, it was suggested that government expenditures and their objects should be studied, as well as sources of government revenues and borrowings, covering such subjects as taxation and its economic effects, and the mechanism and effects of government loans. While there is no dearth of treatises on taxation, we are prone to regard taxes only as burdens and forget the services which we obtain indirectly in exchange. Hence the government's increasing share in economic activities—as an agency for meeting social needs and economic emergencies, regulating private enterprises and maintaining economic balance—ought also to be considered.

B. The two major ELEMENTS OF INCOME—PRODUCTION AND PRICES—classified by areas, industrial divisions and significant groups, are already being studied by Dr. Mills. Other phases of prices include the interrelations among money, credit and inflation; flexible and rigid prices and the effects of their coexistence; reaction of the price system to 'inflation'; and the price system as an instrument of economic control.

C. When we turn to the next major division, the FUNCTIONING OF OUR ECONOMIC ORGANIZATION, we find the National Bureau's several studies of economic fluctuation. Current activity in the field includes the recently published *Seasonal Variations in Industry and Trade* by Dr. Kuznets; a volume by Arthur F. Burns on secular trends in production since 1870, scheduled for publication in the early autumn; and the second volume of Dr. Mitchell's study of business cycles which is in prospect for early 1934. To complete this series it was suggested that two other types of economic fluctuation might profitably be investigated, namely, major cycles and random perturbations.

Under a sub-heading, Mechanism for Production, four subjects were suggested. While it was felt that the National Bureau could contribute little to the great mass of information already available on agriculture, in the industrial fields such topics as the relation between scale of business, costs and profits, the histories of individual industries, and economic stabilization through planning offered a wide area of work.

A study of mechanism for the distribution of goods and services, and specifically, of the distributive trades, were urged as of fundamental importance. Dr. Stone pointed out that whereas we had made great strides in increasing the efficiency of fabrication, little had been accomplished of similar nature in the field of distribution.

As to the financial mechanism, a fourth element of our economic organization, it was felt that research dealing with the banking system of the United States was clearly within the scope of the National Bureau's work, but that despite the additional factual evidence rapidly becoming available, the suggested study of the influence of finance upon industry could not as yet be divorced from opinion.

In the field of international relations the National Bureau has hitherto been concerned solely with the movements of population. With the necessity for international planning forcing itself upon us, those present at the conference felt that a study of the international mobility of capital and labor, including foreign trade and tariffs, and statistical studies of world markets would be of value.

D. On the PROBLEM OF MAINTAINING ECONOMIC BALANCE IN A SYSTEM SUBJECT TO CONTINUAL ECONOMIC CHANGE, there was prolonged discussion over the concept of balance. Dr. Mitchell said that he liked the phrase economic balance because it stresses the functional interdependence of all factors. Colonel Rorty and Mr. Roberts especially endorsed a general survey of the nature of economic balance that would indicate the tolerable adjustment of the various elements, so proportioned and so related functionally as to allow the effective maintenance of the system as a whole. Some objections were raised to the vagueness of the concept as well as to the mechanical implications it conveyed. It was generally agreed that the problem was worthy of further exploration without bar-

ring the possibility of reformulation eventuating from more specific studies.

Closely allied with this major problem of maintaining economic balance, and perhaps more susceptible to statistical analysis, are two topics also suggested for early investigation—the state of competition in the United States and the economic characteristics of the cartel system (for example, in Germany) in view of the possible developments in industrial organization in this country.

The all-day conference was held at the offices of the National Bureau. Those present were: Walton H. Hamilton, Oswald W. Knauth, H. W. Laidler, George E. Roberts, M. C. Rorty, N. I. Stone, Wesley C. Mitchell (Directors); J. Steele Gow, Martha Anderson, Charles A. Bliss, Arthur F. Burns, Ralph C. Epstein, Meredith B. Givens, Simon Kuznets, W. A. Paton, A. G. Silverman, Willard L. Thorp.

PUBLICATIONS, 1921-1933

*1 INCOME IN THE UNITED STATES
By Wesley C. Mitchell, Willford I. King, Frederick R. Macaulay and Oswald W. Knauth
Volume I (1921) Summary 152 pp.

2 *Volume II* (1922) Details 440 pp.

3 DISTRIBUTION OF INCOME BY STATES IN 1919 (1922)
By Oswald W. Knauth 30 pp., $1.30

4 BUSINESS CYCLES AND UNEMPLOYMENT (1923)
By the National Bureau Staff and 16 Collaborators 405 pp., $4.10

*5 EMPLOYMENT, HOURS AND EARNINGS IN PROSPERITY AND DEPRESSION, UNITED STATES, 1920-22 (1923)
By Willford I. King 147 pp.

6 THE GROWTH OF AMERICAN TRADE UNIONS, 1880-1923 (1924)
By Leo Wolman 170 pp., $2.50

7 INCOME IN THE VARIOUS STATES: ITS SOURCES AND DISTRIBUTION, 1919, 1920 AND 1921 (1925)
By Maurice Leven 306 pp., $3.50

8 BUSINESS ANNALS (1926)
By Willard L. Thorp, with an introductory chapter, Business Cycles as Revealed by Business Annals, by Wesley C. Mitchell 380 pp., $2.50

9 MIGRATION AND BUSINESS CYCLES (1926)
By Harry Jerome 256 pp., $2.50

10 BUSINESS CYCLES: THE PROBLEM AND ITS SETTING (1927)
By Wesley C. Mitchell 489 pp., $5.00

*11 THE BEHAVIOR OF PRICES (1927)
By Frederick C. Mills 598 pp.

12 TRENDS IN PHILANTHROPY (1928)
By Willford I. King 78 pp., $1.00

13 RECENT ECONOMIC CHANGES (1929)
By the National Bureau Staff and 15 Collaborators 2 vol., 950 pp., per set, $7.50

14 INTERNATIONAL MIGRATIONS
Volume I, Statistics (1929), compiled by Imre Ferenczi of the International Labour Office and edited by Walter F. Willcox 1,112 pp., $7.00

18 *Volume II, Interpretations* (1931) edited by Walter F. Willcox 715 pp., $5.00

*15 THE NATIONAL INCOME AND ITS PURCHASING POWER (1930)
By Willford I. King 394 pp.

16 CORPORATION CONTRIBUTIONS TO ORGANIZED COMMUNITY WELFARE SERVICES (1930)
By Pierce Williams and Frederick E. Croxton 347 pp., $2.00

17 PLANNING AND CONTROL OF PUBLIC WORKS (1930)
By Leo Wolman 260 pp., $2.50

19 THE SMOOTHING OF TIME SERIES (1931)
By Frederick R. Macaulay 172 pp., $2.00

20 THE PURCHASE OF MEDICAL CARE THROUGH FIXED PERIODIC PAYMENT (1932)
By Pierce Williams 308 pp., $3.00

21 ECONOMIC TENDENCIES IN THE UNITED STATES: ASPECTS OF PRE-WAR AND POST-WAR CHANGES (1932)
By Frederick C. Mills 639 pp., $5.00

22 SEASONAL VARIATIONS IN INDUSTRY AND TRADE (1933)
By Simon Kuznets 455 pp., $4.00

* *Out of print.*

FORTHCOMING PUBLICATIONS

Two National Bureau reports are in final stages of preparation and are expected to be released by autumn. The first of these, *Strategic Factors in Business Cycles*, is a report prepared by Professor John Maurice Clark of Columbia University for the Committee on Recent Economic Changes. It is an analysis, by an outstanding theoretical economist of those factors which are 'strategic' in the sense that they influence business conditions and are susceptible of conscious control.

The second is Dr. Arthur F. Burns' exhaustive analysis of the trends of production series during the past 50 to 60 years. Dr. Burns' conclusions, based upon the application of a nicely elaborated technique, point to the generality of retardation in industry as well as to the presence of periodic swings in rates of change—long cycles—which seem to be related to the more severe business cycles.

Other National Bureau reports now being prepared for submission to the Board of Directors prior to their publication include Harry Jerome's study of mechanization in American industries, Leo Wolman's study of trade union membership, Frederick C. Mills' analysis of recent price movements, Ralph C. Epstein's study of industrial profits and Willard Thorp's study of national income in various countries.

The next issues of the *Bulletin*, scheduled for October and December, will include articles on Prices During the Depression by Dr. Mills and on National Income by Dr. Simon Kuznets. Dr. Kuznets' article will present summary estimates of national income in the United States for the years 1929-1932.

National Bureau of Economic Research

OCTOBER 31, 1933

BULLETIN 48

51 MADISON AVE., NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

ASPECTS OF RECENT PRICE MOVEMENTS

Copyright 1933, National Bureau of Economic Research, Inc.

Frederick C. Mills

Recession and Recovery in World Prices

THE PRICE changes occurring in the United States in the last four years are phases of a world-wide movement. The sharp decline that marked the initiation of the price recession was felt in the Orient, the Near East, the Argentine and Western Europe before the spring of 1929 was past. The record of recovery in recent months shows similar geographical diversity: In half a dozen countries prices were lifted above their depression lows during 1932. The first quarter of 1933 added no less than eight countries to those in which price revival had occurred, and a dozen more advances were recorded before another three months were past. By July of 1933 the force of advancing prices had been felt in nearly every important economic area.

The recent check to the rate of price increase in the United States is also reflected in statistics of world price movements. Of 22 countries, 14 showed lower wholesale prices in August than in June or July. A smaller group of seven countries for which September index numbers are available includes four for which prices were lower in September than in some one of the preceding three months.

The downward swing of world prices during the period of recession, the advance of 1933 and the hesitation of the last several months are shown graphically in Figure 1, on the following page, picturing price movements in the United States and in seven European countries. The movements here depicted relate to price changes in terms of national currencies.[1]

For our immediate purpose the outstanding feature of these movements is found in the character of recent changes occurring in the United States. In regard both to degree of advance and persistence of advance, the movement in this country has been notable.

Characteristics of the Recent Price Revival in the United States

In the United States the force of reviving business activity, coupled with departure from the gold standard, brought an advance of 18 per cent in the level of commodity prices, at wholesale, within a period of seven months—a very substantial gain. But the mere record of average advance gives little information about the nature and economic significance of this change. It is recognized that unique forces contributed to the price advance that began in the United States in the early spring of 1933. It is the more interesting, therefore, to inquire whether the resulting movements of prices were of the type commonly found in cyclical revivals, or whether the entire price movement of 1933 has been of a quite exceptional character. Such information has an obvious bearing upon any judgment concerning the nature of this recovery and its probable future course.

One fact that is clearly revealed by a study of the current price movement is that it has been a more compact rise, a rise more generally shared by commodities at large, than is usual in cyclical upturns following business depressions. Such movements are usually slow to get under way. The force of recovery

[1] Certain measurable characteristics of the price changes in these eight countries are summarized in the following table:

Country	Date of high before recession	Decline in terms of national currencies: Degree (per cent)	Decline in terms of national currencies: Duration (months)	Decline in terms of national currencies: Date of low	Decline in terms of gold values: Degree (per cent)	Decline in terms of gold values: Duration (months)	Decline in terms of gold values: Date of low	Net change from low to Sept., 1933 (per cent): In terms of national currencies	Net change from low to Sept., 1933 (per cent): In terms of gold values
France	Feb., 1929	—42	51	May, 1933	—42	51	May, 1933	+3.1	+3.1
Germany	March, 1929	—35	49	April, 1933	—35	49	April, 1933	+4.3	+4.3
Great Britain	March, 1929	—31	49	April, 1933	—52	54	Sept., 1933	+6.0	..
Italy	March, 1929	—44	54	Sept., 1933	—45	49	April, 1933	..	+1.8
Netherlands	March, 1929	—52	49	April, 1933	—52	49	April, 1933	+4.2	+4.2
Yugoslavia	March, 1929	—43	54	Sept., 1933	—56	54	Sept., 1933	..	..
Austria	May, 1929	—21	45	Feb., 1933	—41	47	April, 1933	+1.9	+7.2
United States	July, 1929	—39	43	Feb., 1933	—49	50	Sept., 1933	+18.4	..

With reference to purely domestic conditions, primary interest attaches to changes in terms of national currencies. Gold values are of major importance in connection with international relations. It is notable that in five of the eight countries here listed wholesale prices in terms of gold values advanced in 1933.

spreads by degrees, with a long lag between the earliest sign of advance and the dissemination of that advance throughout the price system. In this respect periods of revival differ from periods of recession which, typically, are relatively compact movements.[2] But the price rise of 1933 was a concentrated, coherent, upward surge.[3] Here, in place of the slow, cumulative recovery of the usual cyclical revival, we had the concentrated reversal in the direction of price movements and the swift transmission of the stimulus to change which usually characterize price recessions. This particular recovery of prices was not the customary slowly-germinating movement, but a speedy reaction to a changed economic outlook.

In one other respect the upward movement of prices in 1933 was marked by distinctive features. Study of the sequence of recovery in the prices of individual commodities during a number of cyclical revivals reveals evidence of a general pattern, to which price movements during specific cycles conform in greater or less degree.[4] Moreover, the pattern of price revival is not unrelated to the pattern of recession. There is not complete uniformity, of course, but the tendency toward a common sequence of price movements is clearly present. When the sequence of price recovery in 1933 is compared with the standard pattern of revival a degree of conformity less than that usually prevailing is found. So, also, the relationship between the sequence of recession in the prices of individual commodities in 1929 (and the years following) and the sequence of recovery in 1933 is distinctly less marked than that usually found to prevail between recession and succeeding revival. The movements of 1933 show few of those regularities usually found in the cyclical behavior of commodity prices (regularities seldom of a very high order, it is true). It was a price rise stimulated by novel forces and, in its detailed manifestations, differing rather significantly from the usual cyclical revival.

Price Recession and Recovery, in Relation to the Structure of Domestic Wholesale Prices

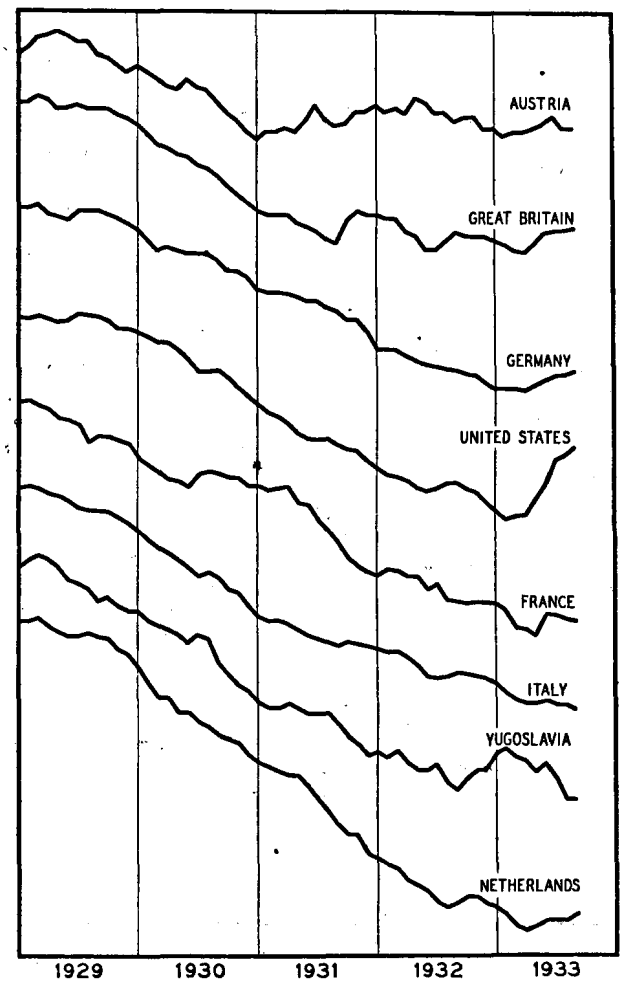
The inequalities that developed among the prices of different types of commodities during the recession that began in 1929 have become notorious. The prices of raw materials fell to unprecedented lows, while the prices of manufactured goods remained relatively high; agricultural products suffered much more severely than did non-agricultural products; goods intended for ultimate consumption declined more severely than did goods intended for use in the construction of capital equipment. Such inequalities, developing over a short period of time, present obvious barriers to a resumption of normal economic activity. The effect of the price advance of 1933 on these inequalities is a matter of considerable interest.

Changes in the relative standing of different groups of commodities, as priced in wholesale markets, are shown in Table 1. These measurements are presented graphically in Figure 2, on page 5.

FIGURE 1

ILLUSTRATING THE CHANGES IN WHOLESALE PRICE LEVELS IN TERMS OF NATIONAL CURRENCIES, JANUARY, 1929, TO SEPTEMBER, 1933

EIGHT COUNTRIES



PLOTTED ON RATIO SCALE

[2] Cf. *The Behavior of Prices* (National Bureau of Economic Research, 1927), pp. 395-403.

[3] Up to and including a date four months after the low point in the general price index (that is, up to June, 1933) approximately 88 per cent of a selected list of 351 commodities, as quoted in wholesale markets, had advanced in price. Over similar periods in ten business revivals occurring between 1892 and 1922 about 61 per cent of this group of commodities have risen in price, on the average.

[4] Cf. *The Behavior of Prices*, p. 135.

TABLE 1

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE IN THE UNITED STATES
1929-1933

Selected Commodity Groups[1]

Number of price quotations	*Commodity group*	*Index numbers of per-unit purchasing power*				
		July 1929	*Feb. 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
144	Raw materials	100	82	91	88	88
516	Manufactured goods	100	111	106	107	107
180	Foods	100	81	88	85	84
480	Non-foods	100	112	108	109	110
74	Products of American farms, raw	100	64	82	78	76
586	All other products (including processed farm products)	100	111	105	106	107
403	Producers' goods	100	96	100	99	99
257	Consumers' goods	100	104	100	102	102

[1] Measurements appearing in this table and in following tables are based, unless otherwise noted, upon index numbers constructed by the National Bureau of Economic Research from price quotations compiled by the United States Bureau of Labor Statistics. The index numbers are weighted aggregates of actual prices, with weights based on average quantities produced in 1927 and 1931. The original price index numbers are given in the Appendix Table.

The index numbers here cited define changes in the average per-unit purchasing power, at wholesale, of commodities in the groups named. That is, the changes shown are in all cases changes relative to the wholesale price index.[5] A commodity that rises in price less rapidly than the general average during a period of rising prices or falls more rapidly during a period of declining prices loses in purchasing power, per unit. The reverse is true of a commodity that rises in price more rapidly than the general average during a period of price advance, or falls less rapidly during a period of price decline. It is such shifts in relative position, rather than absolute price changes, which affect the real worth of a commodity (that is, its per-unit purchasing power, in terms of other commodities).

The movements here shown are measured with reference to July, 1929, as base. Between that month and the low point of the price recession in February, 1933, raw materials lost 18 per cent in real worth (or purchasing power), per unit, while manufactured goods gained 11 per cent.[6] Foods lost 19 per cent, non-foods gained 12 per cent. Most striking were the changes affecting raw farm products and 'all other products', the former group losing no less than 36 per cent in real worth, per unit, the latter gaining 11 per cent. Producers' goods (that is, raw materials or other goods which must undergo further changes in form before being ready for consumption, or which are intended for use in the construction of capital equipment) lost 4 per cent in per-unit worth, while goods in shape for final consumption gained 4 per cent. These are some of the divergencies which developed in the course of the recession in prices and production, and which represented barriers to the free exchange of goods.

How have the changes of the last seven months affected these relations? It is clear, from the entries in Table 1, that between February and July of 1933 there was a notable lessening of the gaps which had been opened up during the period of price recession. The two broad classes of producers' and of consumers' goods, indeed, stood in July, 1933, in the same general relationship as in July, 1929. The price disparity between raw materials and manufactured goods, and that between raw farm products and all other commodities, had been cut in half during this five-month period. The reduction of price discrepancies between foods and non-foods was somewhat less, but a substantial improvement had occurred.

The movements of the last two months, however, constituted a reversal of the tendencies prevailing between February and July. Among the three divisions which show definite cleavages the disparities prevailing in September were wider than those of July. Raw materials, which had risen to within 9 per cent of their pre-recession parity with manufactured goods, dropped to a point 12 per cent below that standard. Foods and raw farm products lost more heavily, falling well below the July high points of real worth, per unit of product.

These shifts call for somewhat more careful consideration. For it is of cardinal importance, in an appraisal of the current price situation, to know whether the net changes occurring since last February reflect the pressure of forces which have persisted during the entire period, or whether they are the net resultants

[5] An index of average purchasing power of commodities in a given group is constructed by dividing the price index of that group by the index of general wholesale prices, both index numbers being on the same base.

[6] The actual price index numbers for these two groups in February, 1933, on the July, 1929, base, were 51 for raw materials, 69 for manufactured goods. Dividing these two index numbers by 62, the price index for all commodities, at wholesale, in February, 1933, we derive the index numbers given in the table.

TABLE 2

INDEX NUMBERS AND MEASUREMENTS OF RATES OF CHANGE IN WHOLESALE PRICES FROM FEBRUARY, 1933, TO SEPTEMBER, 1933

All Commodities and Selected Commodity Groups

Commodity group	Index numbers of wholesale prices				Percentage changes in wholesale prices, 1933[1]							
	July 1929	Feb. 1933	July 1933	Sept. 1933	Feb. to Sept.	Feb. to March	March to April	April to May	May to June	June to July	July to Aug.	Aug. to Sept.
All commodities[2]	100.0	61.7	72.3	74.4	+20.6	+0.8	+0.7	+4.2	+4.1	+6.4	+1.4	+1.4
Raw materials	100.0	50.6	65.5	65.6	+29.6	+2.4	+1.4	+7.4	+5.8	+9.7	—1.2	+1.4
Manufactured goods	100.0	68.6	76.5	79.8	+16.3	0.0	+0.5	+2.6	+3.3	+4.8	+2.8	+1.5
Foods	100.0	50.0	63.6	62.2	+24.5	+2.4	+2.9	+7.1	+3.5	+9.1	—1.9	—0.5
Non-foods	100.0	69.1	77.8	82.2	+18.8	0.0	—0.3	+2.8	+4.4	+5.2	+3.0	+2.4
Products of American farms, raw	100.0	39.5	59.4	56.5	+42.9	+5.0	+3.9	+14.5	+7.3	+12.2	—3.5	—1.5
All other products	100.0	68.2	76.1	79.6	+16.7	0.0	+0.2	+2.3	+3.4	+5.3	+2.4	+2.2
Producers' goods	100.0	59.5	72.1	73.4	+23.4	+1.6	+0.9	+5.8	+4.4	+7.1	+0.4	+1.3
Consumers' goods	100.0	64.4	72.7	75.7	+17.5	+0.2	+0.3	+2.6	+3.7	+5.6	+2.6	+1.5

[1] See the Appendix Table for price index numbers for all the dates here recorded.

[2] These index numbers for all commodities differ slightly from those cited in the text above, and in Tables 5 and 6, which have been constructed by the United States Bureau of Labor Statistics. Somewhat different weighting systems are used in constructing the index numbers of the National Bureau of Economic Research and of the United States Bureau of Labor Statistics.

of conflicting tendencies. Table 2, showing month-to-month movements of prices in these several groups, as well as net changes, bears on this question. The measurements here given relate to actual prices, not to purchasing power.

The retardation of the rate of advance in the general wholesale price index between July and September, after three months of very rapid rise, has already been noted. The measurements for the sub-groups show clearly the nature of the reversal of the tendencies which had prevailed during the five months preceding. During each of the five months from February to July raw materials, raw farm products and producers' goods rose at rates more rapid than those prevailing among their complementary groups. With the exception of but one month the same is true of foods. That is, the upward push of revival was felt most immediately and forcefully by the commodity groups most severely depressed in price. But from July to August and from August to September the precise reverse was true. Those groups which had previously advanced most rapidly in price declined, or rose but slightly, while the groups which had been most successful in resisting the price recession of the preceding years, and which had previously lagged on recovery, spurted ahead. This apparent shift in the incidence of price recovery took place in each of the four commodity divisions shown in Table 2.

RECESSION AND RECOVERY AMONG PRODUCERS' AND CONSUMERS' GOODS

A study of broad categories may fail to reveal extremely divergent movements among the prices of commodities in subordinate groups. It is desirable, in particular, that we follow the changes occurring among different classes of producers' and consumers' goods.

TABLE 3

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE IN THE UNITED STATES 1929-1933

Classes of Producers' and of Consumers' Goods

No. of price quotations	Classes of producers' goods	July 1929	Feb. 1933	July 1933	Aug. 1933	Sept. 1933
403	All producers' goods	100	96	100	99	99
114	Raw	100	80	89	86	87
289	Processed	100	116	111	112	111
184	Intended for human consumption	100	74	89	87	86
103	Intended for use in capital equipment	100	118	108	107	107
103	Intended for use as bldg. materials	100	123	116	117	117
184	Producers' goods intended for human consumption	100	74	89	87	86
55	Foods	100	65	82	77	75
129	Non-foods	100	83	97	97	97

No. of price quotations	Classes of consumers' goods	July 1929	Feb. 1933	July 1933	Aug. 1933	Sept. 1933
257	All consumers' goods	100	104	100	102	102
30	Raw	100	90	96	94	92
227	Processed	100	108	102	103	104
227	Consumers' goods, processed	100	108	102	103	104
95	Foods	100	96	92	90	90
132	Non-foods	100	119	110	115	117

Measurements appear in Table 3. They are shown graphically in Figure 2.

It is clear that the index for all producers' goods, which shows a loss of but 4 per cent in real worth, per unit, between July, 1929, and February, 1933, does in fact conceal some highly divergent movements among different classes of such goods. Raw producers' goods lost 20 per cent of their per-unit worth during this period of recession, while processed producers' goods gained 16 per cent in real worth per unit. The general recovery of raw material prices which began in March, 1933, helped to lessen this disparity.

More notable, however, are the differences revealed by the second set of figures in the producers' goods group. Producers' goods intended (after further fabrication) for direct human consumption lost 26 per cent in average per-unit purchasing power during the period of declining prices that ended in February, 1933. This great decline, coupled with the tardiness of changes in the prices of other producers' goods, brought substantial increases in the worth of such other goods, in exchange for commodities in general. Commodities intended for use in capital equipment (other than building materials) rose 18 per cent in per-unit purchasing power, between July, 1929, and February, 1933, while goods intended for use as building materials rose no less than 23 per cent. This means that the power of producers of other goods to buy building materials and articles of capital equipment was substantially reduced during the depression. The high prices of such equipment served as a strong barrier to the initiation of programs of capital extension. (Other factors, of course, worked in the same direction during this period.)[1]

But here, also, the recovery of the spring and summer wrought great changes. The first effect of price recovery was definitely correctional, in that price disparities developing during the recession were sharply reduced. Within five months a loss of 26 per cent in the relative worth of a unit of producers' goods intended for human consumption, after fabrication, was reduced to 11 per cent. Over the same period the gain in per-unit worth of goods entering into capital equipment was reduced from 18 to 8 per cent. Building materials were reduced also, in purchasing power, but by a smaller amount. Between July and September the tendency toward pre-recession price relations among different classes of producers' goods was checked, and in some instances reversed. Raw producers' goods and producers' goods intended for ultimate human consumption lost some of their earlier gains; building materials, already high in per-unit worth, advanced fractionally. But goods intended for use in capital equipment, which were also relatively high-priced, declined slightly in real value.

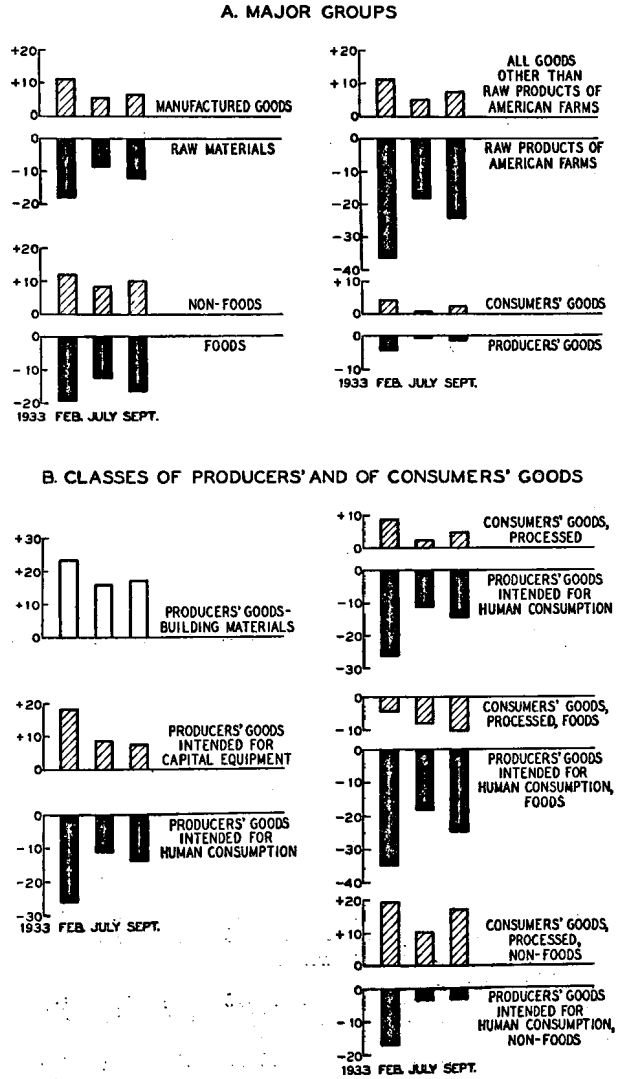
Among goods ready for consumption the gap between raw and processed categories was less pronounced than among producers' goods, but it was still

[1] These statements apply to the cost of new capital equipment at depression prices. Another major obstacle to normal activity has been created by the wide divergence between the original costs of existing capital equipment and the current selling prices of manufactured goods. High overhead costs, due to capital investment at high pre-depression prices, have rendered profitable operation at existing price levels difficult. This problem and other questions relating to the liquidation of pre-recession capital values are not here discussed.

FIGURE 2

GRAPHIC REPRESENTATION OF CHANGES IN THE REAL VALUES, PER UNIT, OF COMMODITIES IN SELECTED GROUPS, JULY, 1929, TO SEPTEMBER, 1933

(CHANGES ARE MEASURED AS PERCENTAGE DEVIATIONS FROM JULY, 1929, PARITY WITH GENERAL WHOLESALE PRICES)



wide, at the low point of the depression. This gap was very greatly reduced by the recovery, up to July, but was opened again by the price movements occurring between July and September.

One of the most interesting comparisons to be drawn from these figures is that between producers' goods intended for human consumption, after fabrication, and processed consumers' goods. These two groups are representative of the same general class of commodities at successive stages of fabrication and distribution (though precisely the same commodities, at successive stages, are not included in the two groups). At the producers' goods stage, as we have seen, there was a drop of 26 per cent in per-unit purchasing power between July, 1929, and February, 1933; at the consumers' goods stage there was an advance of 8 per cent. (In terms of actual prices, these shifts were due to a drop of 54 per cent in the average wholesale price of producers' goods intended for human consumption, a decline of 33 per cent in the average wholesale price of processed consumers' goods. The average price of all commodities fell 38 per cent.) Here was a notable widening of the price differential representing the cost of the services of fabricators and distributors, a development with important economic consequences. For the drop in the prices of goods bought by producers for fabrication lessens the income and curtails the purchasing power of the sellers of these goods. The drop in the incomes of consumers, and the failure of the prices of finished consumption goods to decline correspondingly, check the flow of goods to final consumers. This particular discrepancy reflected a serious disruption of the normal processes of buying and selling and contributed to a substantial reduction in the volume of trade and consumption.

This major disparity was materially reduced between February and July. Consumption goods awaiting fabrication were lifted to within 11 per cent of their pre-recession parity with all commodities, while finished consumers' goods were reduced to within 2 per cent of that parity. The correctional push of price recovery was nowhere so clearly evident as here. But here also, from July to September, the gap was widened again. Reference to the figures for foods and non-foods, within each of these main categories, reveals a striking recent drop in the real worth of food products, at the producers' goods stage, and an equally striking advance of non-foods, at the consumers' goods stage. It is these two movements, predominantly, which have opened a wider gap between the two major groups in the months just past.

For these groups, also, we may trace month-to-month changes in actual prices. The shifting incidence of the stimulus to price recovery is best revealed by such measurements. These appear in Table 4.

Here again we find it to be generally true that the first stimulus to price recovery was felt among the most severely depressed classes of goods, and that the upward pressure was maintained among such goods through the month of July. Thereafter there occurred the shift already noted. Those goods which had lagged behind up to that point—processed producers' goods, processed consumers' goods, building materials—began to pick up. The contrast is not so clearly drawn as in the case of the major divisions of goods first discussed, but it is there. In the main, the price advance from July to September was led by goods already high-priced, whereas the advance from February to July was predominantly due to increases among low-priced elements of the price structure.

Recent Movements of General Elements of the Price Structure

For a more complete picture of the current price situation we should trace recent changes beyond the

TABLE 4

Index Numbers and Measurements of Rates of Change in Wholesale Prices from February, 1933, to September, 1933

Classes of Producers' and of Consumers' Goods

Commodity group	Index numbers of wholesale prices				Percentage changes in wholesale prices, 1933							
	July 1929	Feb. 1933	July 1933	Sept. 1933	Feb. to Sept.	Feb. to March	March to April	April to May	May to June	June to July	July to Aug.	Aug. to Sept.
Producers' goods	100.0	59.5	72.1	73.4	+23.4	+1.6	+0.9	+5.8	+4.4	+7.1	+0.4	+1.3
Raw	100.0	49.1	64.6	65.0	+32.2	+3.1	+2.0	+8.9	+5.4	+8.8	—1.7	+2.4
Processed	100.0	71.4	80.5	82.8	+15.9	—0.1	+0.5	+2.7	+3.6	+5.6	+2.4	+0.4
For human consumption	100.0	45.8	64.6	64.3	+40.3	+4.0	+2.5	+12.0	+6.6	+10.7	—0.8	+0.3
For capital equipment	100.0	73.1	77.8	79.3	+8.6	—1.0	+0.9	+1.2	+2.7	+2.7	+1.0	+0.9
For building materials	100.0	75.9	84.3	86.9	+14.5	+0.5	+0.1	+1.6	+3.6	+4.8	+2.1	+1.0
Consumers' goods	100.0	64.4	72.7	75.7	+17.5	+0.2	+0.3	+2.6	+3.7	+5.6	+2.6	+1.5
Raw	100.0	55.8	69.1	68.1	+22.1	0.0	—0.7	+2.6	+7.5	+13.2	—0.1	—1.3
Processed	100.0	66.5	73.5	77.5	+16.6	+0.2	+0.6	+2.3	+3.0	+4.0	+3.3	+2.2
Producers' goods intended for human consumption												
Foods	100.0	40.2	59.0	55.9	+38.9	+6.9	+4.7	+13.0	+3.2	+12.4	—4.4	—1.0
Non-foods	100.0	51.1	69.8	72.4	+41.7	+1.9	+0.8	+11.3	+9.2	+9.4	+2.3	+1.5
Consumers' goods, processed												
Foods	100.0	59.0	66.5	66.8	+13.2	+0.7	+2.0	+4.4	+1.3	+3.7	—0.3	+0.8
Non-foods	100.0	73.2	79.9	87.2	+19.1	—0.3	—0.4	+1.0	+4.2	+4.4	+5.7	+3.3

TABLE 5

INDEX NUMBERS OF CHANGES IN VARIOUS ELEMENTS OF THE PRICE STRUCTURE OF THE UNITED STATES, AND IN RELATED FACTORS, JULY, 1929, TO SEPTEMBER, 1933

Economic element[1]	*Index numbers*				
	July 1929	*Feb. 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
Wholesale prices	100.0	62.0	71.4	72.0	73.3
Cost of living of industrial workers	100.0	72.1	75.2	76.9	77.9
Retail food prices	100.0	57.2	66.0	67.3	67.3
Retail prices of clothing and house-furnishings	100.0*	59.0	64.3	67.9	72.5
Prices received by farmers	100.0	35.0	54.3	51.4	50.0
Prices paid by farmers	100.0	66.4	70.4	73.7	76.3
Average per-unit purchasing power of farm products[2]	100.0	53.3	77.2	69.6	65.2
Hourly earnings, employed manufacturing labor	100.0	79.0	77.5	84.7	—
Per capita earnings, employed manufacturing labor	100.0	65.2	69.9	73.3	72.9†
Real per capita earnings, employed manufacturing labor[3]	100.0	90.4	93.0	95.3	93.6†

* October, 1929.

† Estimated.

[1] The index numbers of wholesale prices and retail food prices are those of the United States Bureau of Labor Statistics. The indexes of cost of living and hourly earnings have been compiled by the National Industrial Conference Board. The indexes of retail prices of clothing and house-furnishings are those computed by Fairchild Publications from prices reported by 36 leading retail organizations. The index numbers of farm prices and of prices paid by farmers are compiled by the U. S. Department of Agriculture from prices received by farmers for their crops and animal products and from prices paid for commodities used in production and family maintenance. The index of per capita earnings for manufacturing labor has been secured by dividing the Federal Reserve Board's index of factory payrolls by their comparable index of employment. The change in per capita earnings from August to September, 1933, has been estimated from data published by the Bureau of Labor Statistics.

[2] Ratio of index of average prices received by farmers to index of average prices paid by farmers for commodities used in production and in family maintenance.

[3] Ratio of index of average weekly earnings of manufacturing employees to index of cost of living of industrial workers.

field of wholesale prices. Some relevant measurements appear in Table 5.

All elements of the price system suffered in the disastrous drop that began in 1929. Here, again, we find diversity of fortunes. A drop of 38 per cent in wholesale prices between July, 1929, and February, 1933, occurred concurrently with declines of 28 per cent in the general cost of living, of 43 per cent in retail food prices, of 41 per cent in department store and mail order prices of clothing and house-furnishings, of 65 per cent in prices received by farmers, and of 34 per cent in prices paid by farmers. In the field of earnings, which lies outside the system of commodity prices proper, there occurred a decline of 21 per cent in the average hourly earnings of manufacturing labor, a drop of 35 per cent in the per-capita earnings of labor employed in manufacturing plants.[8] (These figures re-

[8] The latter index, of course, defines a change in a sum, not in a price or rate, and is not strictly comparable to the other measurements cited.

TABLE 6

MEASUREMENTS OF RATES OF CHANGE IN VARIOUS ELEMENTS OF THE PRICE STRUCTURE OF THE UNITED STATES, AND IN RELATED FACTORS, FEBRUARY, 1933, TO SEPTEMBER, 1933

Economic element	*Percentage changes, 1933*							
	Feb. to Sept.	*Feb. to March*	*March to April*	*April to May*	*May to June*	*June to July*	*July to Aug.*	*Aug. to Sept.*
Wholesale prices	+18.4	+0.7	+0.3	+3.8	+3.7	+6.0	+0.9	+1.9
Cost of living of industrial workers	+8.0	—0.4	—0.4	+0.8	+1.0	+3.3	+2.3	+1.3
Retail food prices	+17.6	0.0	—1.1	+4.4	+3.2	+8.2	+1.9	0.0
Retail prices of clothing and house-furnishings	+22.9	—0.3	—0.4	+1.4	+2.7	+5.3	+8.4	+4.2
Prices received by farmers	+42.9	+2.0	+6.0	+17.0	+3.2	+18.8	—5.3	—2.8
Prices paid by farmers	+14.9	—1.0	+1.0	+1.0	+1.0	+3.9	+4.7	+3.6
Average per-unit purchasing power of farm products	+22.4	+2.0	+4.0	+17.3	+1.6	+14.5	—9.9	—6.3
Hourly earnings, employed manufacturing labor	...	—0.9	0.0	—1.5	—0.2	+0.7	+9.2	...
Per capita earnings, employed manufacturing labor	+11.8	—3.7	+2.6	+4.8	+3.0	+0.4	+4.8	—0.6*
Real per capita earnings, employed manufacturing labor	+3.5	—3.3	+3.0	+4.0	+2.0	—2.8	+2.4	—1.8*

* Estimated.

late to the average earnings of *employed* labor. They do not include the great losses in the aggregate earnings of labor resulting from unemployment.)

The changes taking place between February and July served definitely to lessen disparities among the economic elements listed. These changes may be followed most readily on Table 6, which shows the varying rates of change, month by month, among these several economic elements.

During the first five months of price recovery the more rapid advances occurred among the more depressed elements—prices received by farmers, retail food prices, wholesale prices. A decline occurred in the average hourly earnings of manufacturing labor. Between July and September there was not the general reversal of tendencies that occurred among wholesale price groups, but something similar took place. Of the three seriously depressed price groups which had risen most rapidly up to July, one (prices received by farmers) declined, while two (retail food prices and general wholesale prices) advanced at much lower rates. Foods, in fact, were unchanged between August and September. Retail prices of clothing and house-furnishings and prices paid by farmers jumped sharply upward. Perhaps most striking was the rapid advance in the average hourly earnings of manufacturing employees, an advance of no less than 9 per cent in the single month from July to August. Here, of course, the influence of newly established codes is evident.

These records do not permit a complete appraisal of the changes occurring in all parts of the price system. It is clear that the movements of the last two months have adversely affected the correctional tendencies prevailing among farm prices and the prices paid by farmers. The rise in general living costs through August was not sufficient to offset advancing hourly and per capita earnings. Between August and September, however, average per capita earnings of manufacturing employees declined, while living costs continued to advance. The very rapid climb of retail prices of clothing and house-furnishings in August and September and the relatively rapid rise of retail food prices through August point to the clear possibility of an accentuated advance in general living costs in the near future.[9]

Recent Price Movements Viewed Against a Pre-War Standard

The use of July, 1929, as a standard of reference in price comparisons seems to involve the assumption that the relations then prevailing were 'normal.' This is, of course, far from being the case. There is no one normal system of relations among commodity prices which must prevail if the economic system is to function smoothly. The use of the 1929 standard as a provisional criterion may be justified on the ground that pre-recession relations had existed for some time, dur-

[9] The considerable increases that occurred between February and September in retail food prices and in retail prices of clothing and house-furnishings, increases of the same order of magnitude as the advance in wholesale prices, constitute somewhat novel elements in a recovery situation. The traditional tendency of retail prices to lag well behind wholesale prices, and to fluctuate much less widely, is not here exemplified. Indeed, the preceding price declines in these two groups exceeded the average decline in wholesale prices. However, neither of these index numbers can be taken to represent general prices at retail, which have undoubtedly been more sluggish than these measurements would indicate. One relates to foods alone, one to clothing and house-furnishings as priced in 36 retail organizations conducting large department and specialty stores and mail order businesses. But it is probably true, however, that the traditional sluggishness of retail prices has been considerably reduced during the present depression. Wide price shifts break down old pricing standards, and cause dealers to follow more flexible policies in fixing and changing prices. Again, the growth of chain stores and the increasing scope of large department stores have placed in positions of greater dominance, in retail trade, men who are alertly aware of general business changes, and who are quick to adjust their prices to changes in general market conditions.

TABLE 7

Changes in Prices and Related Elements with Reference to a Pre-War Standard

Economic element[1]	*1913*	*1919*	*1921*	*July 1929*	*Feb. 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
Wholesale prices	100	199	140	138	86	99	100	101
Cost of living of industrial workers	100	182	182	172	127	132	135	137
Retail food prices	100	186	153	159	91	105	107	107
Prices received by farmers	100	209	116	140	49	76	72	70
Prices paid by farmers	100	198	149	152	100	106	111	115
Average per-unit purchasing power of farm products	100	106	78	92	49	72	65	61
Hourly earnings, employed manfacturing labor	100*	.....	213	235	186	182	199	.....
Per capita earnings, employed manufacturing labor	100	201	204	202	142	152	159	158†
Real per capita earnings, employed manufacturing labor	100	110	112	117	112	115	118	115†

* July, 1914 = 100.

† Estimated.

[1] The index of wholesale prices is that of the U. S. Bureau of Labor Statistics shifted to the 1913 base. The index of cost of living has been secured by splicing the monthly index of the National Industrial Conference Board to the semi-annual index of the U. S. Bureau of Labor Statistics. The index of per capita earnings for manufacturing labor has been secured by splicing the index cited in Table 5 to an index, on 1914 as 100, similarly derived from data on wages and employment compiled by the Census of Manufactures. Adjustment to the 1913 base has been made through the use of Douglas' index of average annual earnings of manufacturing wage earners. Other sources are given in Table 5.

ing which a relatively efficient basis of economic activity had prevailed, and during which living standards were relatively high. We shall do well, however, to survey recent changes with reference to a pre-war standard, as well as to a pre-recession standard. Did the price movements occurring during the recession, or during the subsequent advance, represent returns to pre-war relations, or departures from such relations? Of course we may not assume that pre-war relations are 'normal' under present conditions. Much water has gone under the bridge since 1913. Substantial changes have occurred in costs and in physical marketings. Modifications in price relations would be expected as a result of such changes. 'Price disparities', with reference to such a distant base, are far less likely to represent economic maladjustments than are discrepancies developing over a brief period of violent change. Nevertheless, a knowledge of pre-war relations, and of the degree to which present relations depart from them, is relevant to a judgment of the existing situation.

We may consider first certain general elements of the price structure, with related measurements of the earnings of manufacturing labor. The figures appear in Table 7.

The situation in July, 1929, before the recession set in, reveals notable alterations in price relations, as compared with the 1913 situation. Retail food prices had advanced more than general wholesale prices, and the cost of living stood at a conspicuously higher level. Prices paid by farmers had risen more than had prices received by farmers, so that the average per-unit purchasing power of farm products was some 8 per cent less than in 1913.[10] Both hourly and per-capita earnings of manufacturing labor had risen to more than double the 1913 standard. Rising costs of living absorbed a considerable part of these gains, but real earnings were appreciably higher than before the War.

At the low point of the depression, in February, 1933, this picture had been materially altered. Wholesale prices stood 14 per cent below their 1913 level; the cost of living of industrial wage-earners was 27 per cent above that level. Prices received by farmers were approximately 51 per cent below the 1913 standard, while prices paid by farmers stood just at the 1913 level. Per-capita and hourly earnings of manufacturing labor were well above the 1913 standard. Reduction to real terms through correction for living costs left such earnings higher than they had been in 1913. (We deal here only with the average earnings of *employed* labor in manufacturing industries. Account is not taken of losses in aggregate earnings resulting from unemployment.)

These differences indicate the magnitude of the shifts that had occurred, during the twenty years following 1913, in the relations among major elements of the economic structure. A level of wholesale prices that had more than doubled between 1913 and 1920 had fallen back to a point below its pre-war level. Other elements (except farm prices and retail food prices) had lagged behind on the downward readjustment. As a result the topography of the economic scene had been vastly altered during the rise and subsequent declines. By the winter of 1932-33 there had been no general adaptation to these altered relations.

Changes occurring during the first five months of recovery brought a notable lessening of these disparities. Without attaching undue importance to the pre-war standard, it is a reasonable assumption that the changes of this period tended to restore working economic relations. Conflicting movements, which have already been noted, occurred during August and September.

We turn now to recent changes in the structure of wholesale prices, referred to a pre-war standard. Alterations in the per-unit purchasing power of certain major elements of this structure are defined by the entries in Table 8.

The post-war cheapening of raw materials, and corresponding enhancement of the real worth of manufactured goods, is a matter of common knowledge. Between 1921 and 1929 a slow movement toward pre-war relations had prevailed, though a margin still existed in July, 1929. This had been greatly widened by February, 1933. Subsequent changes, up to July, 1933, raised raw material prices more rapidly than prices of manufactured goods, and thus served to bring their respective values closer to 1913 parity. The reversal of movement in August and September car-

[10] An accurate measurement of changes in the average per-unit purchasing power of farm products would take account of changes in the quality of goods purchased by farmers. Quality variations enter to complicate most measurements of changes in commodity prices and in the volume of production, usually in ways too obscure to define accurately. The usual method of measuring changes in the purchasing power of farm products involves the comparison of price changes occurring among two groups of commodities—farm products, and commodities bought by farmers for use in production and in family maintenance. The first of these groups is composed of standard raw materials (wheat, cotton, hogs, cattle, etc.) subject to only minor variations in quality. The second includes a diverse lot of materials, including farm machinery, automobiles, tractors, etc., many of which have been marked by steady improvement in quality with the passing years. It is estimated, for example, that the quality —the productive efficiency—of farm machinery increased 70 per cent between pre-war years and 1932. (Estimate cited in *Index Numbers of Prices Paid by Farmers for Commodities Bought*, U. S. Department of Agriculture, 1933.) Automobiles and tractors have been marked by similar improvements in quality, over the period of their general use. It is obviously erroneous, if long periods of time are involved, to set against the prices of goods of unvarying quality prices of equipment which has improved so substantially in quality, without taking account of quality changes. The above measurements, therefore, certainly overstate the degree of loss occurring between 1913 and post-war years in the purchasing power of farm products.

TABLE 8

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE IN THE UNITED STATES 1913 TO SEPTEMBER, 1933

Selected Commodity Groups

Commodity group	*Index numbers of per-unit purchasing power*[1]							
	1913	*1919*	*1921*	*July 1929*	*Feb. 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
All raw materials	100	96	83	95	78	86	84	84
Manufactured goods	100	101	108	102	114	108	109	110
Foods	100	103	90	102	83	90	87	86
Non-foods	100	98	106	99	111	106	108	109
Products of American farms, raw	100	109	82	102	66	84	80	78
All other products	100	98	104	99	110	105	106	107
Producers' goods	100	98	95	95	92	95	94	94
Consumers' goods	100	102	108	108	112	108	109	109

[1] The index numbers for the period 1913 to 1929 are based on geometric means of relative prices, unweighted, except that prices of important commodities have been represented by more than one series (see *Economic Tendencies*, p. 584). Beginning with 1929 the number of series included was increased from 492 to 660, and the method of averaging was modified. The method now used is explained in the footnote to Table 1.

ried the two sets of index numbers farther apart, leaving the per-unit purchasing power of raw materials, at the last date cited, 16 per cent below the 1913 standard, while manufactured goods had a per-unit purchasing power 10 per cent above that standard. A similar narrowing of the margins between the real per-unit worth of foods and non-foods, of raw farm products and other products, and of producers' and consumers' goods occurred between February and July, and a similar widening between July and September. Most pronounced were the movements affecting the purchasing powers of products of American farms, in raw state, and of 'all other products'. From a position of decided advantage in 1919 raw farm products lost greatly in relative position by 1921. Thereafter there came slow recovery to approximate parity (in wholesale markets) with other products in July, 1929. By February, 1933, raw farm products had lost 34 per cent of their 1913 purchasing power, per unit, while other products had gained 10 per cent. The notable recovery of the next five months, and the reversion thereafter, have already been commented upon. A wide departure from pre-war parity is shown by the September figures.

The evidence of Table 8, then, bears out that of Table 7. So far as one may judge from the standards provided by earlier relations, the first tendency of price recovery in 1933 was definitely to restore more equitable and more economically desirable relations among different elements of the price structure. Movements during August and September were away from these standards. It is most unlikely, of course, that ultimate stability will be attained with relations precisely the same as those of 1929, or those of 1913. But it is probable that relations conducing to general economic activity and to economic welfare today will be closer to those prevailing at these earlier dates than to those existing at the low point of the depression in February, 1933.

One rather striking feature of Table 8 has to do with the relations between producers' goods and consumers' goods. The entries indicate that producers' goods have been undervalued (with reference to 1913 standards) during the entire period since 1921, and that the relations between producers' and consumers' goods in July, 1933, with respect to per-unit purchasing power, were precisely the same as those prevailing in 1921 and in July, 1929. But these two large categories must be broken down, if we are to have an accurate picture of recent price movements. More detailed measurements are given in Table 9.

The low prices of raw producers' goods, it is apparent, kept the purchasing power index for all producers' goods below parity with consumers' goods. Processed producers' goods were relatively high priced following the depression of 1920-21, and were materially advanced in relative worth by the changes occurring between July, 1929, and February, 1933. In the latter month, when raw producers' goods had a per-unit worth 29 per cent lower than in 1913, processed producers' goods stood 14 per cent above that standard. Recent movements have brought these two indexes closer together, but a substantial margin persisted in July, 1933. Consumers' goods, both raw and processed, have remained above the general average of prices since 1921, though their respective positions have been altered by recent movements.

Perhaps most significant of these groupings is that which distinguishes producers' goods intended for human consumption, after fabrication, and goods intended for use in capital equipment. The relatively high value of goods entering into capital equipment and the low value of producers' goods intended for sale to consumers, after fabrication, have been notable features of the entire post-war situation.[11] This has

[11] Cf. *Economic Tendencies in the United States*, published by the National Bureau of Economic Research in conjunction with the Committee on Recent Economic Changes, pp. 363-71.

TABLE 9

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE IN THE UNITED STATES 1913 TO SEPTEMBER, 1933

Classes of Producers' and of Consumers' Goods

Comodity group	*Index numbers of per-unit purchasing power*							
	1913	*1919*	*1921*	*July 1929*	*Feb. 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
Producers' goods	100	98	95	95	92	95	94	94
Raw	100	96	78	90	71	80	77	78
Processed	100	100	107	99	114	110	111	110
For human consumption[2]	100	104	82	88	65	78	77	76
For capital equipment[2]	100	94	110	103	122	111	111	110
Consumers' goods	100	102	108	108	112	108	109	109
Raw	100	97	101	115	104	110	108	105
Processed	100	103	109	106	114	108	110	111
Producers' goods intended for human consumption[1]								
Foods	100	107	78	98	64	80	76	74
Non-foods	100	102	84	81	67	78	78	78
Consumers' goods, processed								
Foods	100	102	98	102	98	94	92	92
Non-foods	100	105	124	111	132	123	128	130

[1] These index numbers include building materials prior to 1929, but not since then. Beginning with 1929 a separate index number of the prices of building materials has been constructed (see Appendix Table). Earlier and later index numbers have been spliced, in this table, on the assumption that they are representative of the general price movements occurring in the groups in question.

meant relatively low material costs for manufacturing enterprises, with consequent opportunities for operating profits, but high costs of capital goods. New plants, built at high cost, and expensive industrial equipment swelled investment values appreciably during this period. The present measurements show that relatively high charges for new capital equipment persisted throughout the depression that began in 1929. Between July, 1929, and February, 1933, the per-unit worth of goods for use in capital equipment had risen from a level 3 per cent above the 1913 standard to a level 22 per cent above that standard. In February of this year the per-unit purchasing power of producers' goods intended for ultimate human consumption stood 35 per cent below the 1913 base.

We have no historical record of such a wide gap as this, between the two varieties of cost which producers must meet. The cost of new capital investment, at such prices, was practically prohibitive. But this difference, too, was appreciably reduced by the price changes of 1933. By July, 1933, the index of per-unit worth of producers' goods for human consumption had risen to a level 22 per cent below the 1913 standard, while the corresponding index for capital equipment had fallen to a level 11 per cent above that standard. The latter figure, very close to that of 1921, still represents capital costs which appear unduly high, with reference to past standards, but the gap between these and other prices was much narrower than it had been five months earlier. The next two months brought only slight changes here. The September figure for capital equipment was slightly below the July entry—a promising sign in view of the other changes which had occurred.

The relations between the prices, and the per-unit purchasing power, of producers' goods intended for ultimate human consumption, after fabrication, and the corresponding measurements for processed consumers' goods are of exceptional interest. These classes of goods (though not identical in composition) represent two distinct stages along the path followed by goods in the course of their fabrication and distribution. The index numbers of purchasing power appear in Table 9.

The recession of 1920-21 brought a sharp drop in the average real worth of goods awaiting fabrication, and intended for consumption and direct use. At the same time there occurred a material advance in the real worth, per unit, of processed consumers' goods. After this recession there was no restoration of earlier price relations. Processed consumers' goods remained on a level of real values permanently higher than in 1913. Sellers of producers' goods intended for human consumption suffered an enduring loss in economic power, while the purchasing power of consumers in general was maintained through higher industrial wages and higher disbursements to certain other groups of income recipients. The economic system moved forward under a modified set of price relations. The recession and depression of 1929-33 accentuated the disparity between these two commodity groups. In February, 1933, the index of per-unit purchasing power of consumption goods, at the producers' goods stage, was 35 per cent below the 1913 standard. The index for similar goods ready for consumption was 14 per cent higher than in 1913. Price declines among goods purchased by manufacturers for fabrication and sale to consumers were not accompanied by corres-

ponding declines in the prices of goods in shape for final consumption. (This expanding margin, which is found, in some degree, in all periods of price recession, is partially explained by the fixed character of many production costs and by the relatively higher overhead charges assessed against each unit of a reduced output. The ability of manufacturers in certain industries to adapt themselves to changed conditions of demand through reduction of output, rather than of price, is also a factor of some importance.)

Here, also, the forces of recovery during the first five months of advance served to bring about relations closer to earlier standards. The prices of such commodities at the producers' goods stage were raised appreciably, while no corresponding advance occurred in the prices of finished goods. The margin in July, 1933, was still very wide, judged by pre-war standards (purchasing power indexes were 78 and 108, respectively, for producers' goods intended for human consumption and for processed consumers' goods), but the force of price recovery had been exerted, apparently, in directions conducive to more stable and more equitable price relations. From July to September, however, consumption goods awaiting fabrication declined again, in purchasing power, while finished consumers' goods advanced. This rise in high-priced goods, with a fall in low-priced goods, represents a reversion toward earlier and probably less desirable relations.

Conclusion

Price Relations and Economic Recovery

The price situation at the beginning of 1933 was marked by certain outstanding characteristics. Prices to consumers of finished goods were high, with reference to the prevailing price level; the prices of raw materials, on which the incomes of important consuming groups depend, were very low. The prices received by producers of agricultural products, in particular, were seriously depressed, while the prices paid by farmers for goods needed for production and for family maintenance were high. Low prices of the raw materials of industry, coupled with relatively high prices for finished goods, put manufacturers in an advantageous position, on the operating side. (This price advantage, of course, was largely fictitious, because the volume of production and sales was so abnormally low.) On the investment side, however, there prevailed relatively high prices for goods entering into capital equipment and for building materials, a condition which (with other circumstances) tended to restrict activity in industries producing capital goods. A factor which has in the past served to stimulate revival from depression was thus reduced materially in potency.

These conditions presented certain definite problems. One was how the flow of goods to consumers was to be stimulated with the real value of raw materials so low, in comparison with earlier standards, and with the real value of consumers' goods so high. The restoration of activity in industries producing capital goods, with production and sales low in volume and with the costs of new equipment excessively high, constituted a second major problem.[12]

As regards the first of these problems three alternatives existed, on the price side. One was a resumption of activity under the then-existing conditions—low prices for raw materials and relatively high prices to consumers. A second was continued liquidation of finished goods until something approaching pre-recession parity with raw materials was restored. A third was the restoration of more satisfactory terms of exchange between raw and finished goods through advances in the prices of raw materials, rather than through further liquidation of manufactured goods.[13]

Of these alternatives the first was not an impossible one. A modern economic system functions not under one rigorously prescribed set of conditions, but may

[12] Each of these problems involves factors beyond the field of prices, but it is the price phase which now concerns us.

[13] All these alternatives, of course, involved the physical processes of production and consumption, as well as prices. For it is a function of prices to reflect underlying relations among physical quantities. To the extent that prices are merely symbols, enduring changes in price relations may be effected only through alterations in the physical quantities concerned.

This matter requires brief comment, if the present exposition is not to be misunderstood. In a thoroughly competitive economic system, with a price system flexible in all its parts, prices would be simply symbols, reflecting physical relations and changing immediately and freely as the physical factors of demand and of supply changed. Prices would be passive elements in economic change. But when parts of the price system lose their elasticity, when the prices of some classes of commodities or services become inflexible through regulation, agreement, monopolistic or semi-monopolistic control, or even through the stabilizing influence of important fixed charges, then prices may become active factors in economic change. Under these conditions 'price disparities' may cease to be merely reflections of changed physical relations, and may become themselves instrumental in influencing the physical processes which, in a relatively simple and freely competitive economy, they merely mirror. The chains of cause and effect which tie together prices and the physical processes of economic life may thus operate in both directions. Under contemporary conditions they do so operate. It is an inaccurate view of modern economic life to conceive of a one-way causal relationship.

During a period of violent change in economic conditions, marked by wide fluctuations in the average level of prices, rigidity in some parts of the price structure tends to prevent prompt adaptation of all the elements of that structure to the new situation. At such a time changed price relations cease to be merely symptoms and become themselves active factors, conditioning the process of physical readjustment. And since the readjustment of physical conditions (of consumption, production, trade) to sharply modified price relations is likely to be an extended and economically painful process, price disparities

adapt itself to a variety of alternative situations. But with a gap as wide as that prevailing in the winter of 1932-33 it was highly improbable that working relations among economic elements could be restored on the basis of existing price conditions. The modes of using our productive resources, our investments of capital, the economic distribution of man-power were not adapted to the price relations which existed after four years of deep disturbance. Radical shifts in the distribution of income and enduring changes in the status of economic groups would have been involved, changes more profound and disturbing than would have been accepted without continuing social unrest. The restoration of price relations closer to those prevailing at earlier times, a restoration to be effected through continued liquidation of prices still substantially above the average or through the raising of the most seriously depressed prices, seemed to be an essential condition of economic recovery. So also the second problem, on its price side, came down to the central question whether the prices of goods entering into capital equipment could be brought more closely into line with other prices, either through the raising of other prices or the reduction of the prices of capital goods and building materials.

The recovery that was initiated last March tended definitely, up to July, to restore earlier relations through a relatively rapid advance of the more heavily depressed prices. In all the major groups reviewed, in which widely disparate price relations existed at the beginning of 1933, the first effects of revival were definitely correctional in character. The incidence of price-raising forces seemed to be precisely that which was economically desirable. Although the advance appeared to reflect a swift reaction to changed economic prospects, rather than the customary slow germination of recovery, the initial effects on the price structure were unquestionably salutary. With the check to the general price advance in mid-summer the pressure of price change was shifted. Commodity groups which had most successfully resisted the price decline of the preceding four years, and which had moved upward but slowly during the first months of recovery, began to feel the push of changing values, while there was a clear retardation of the rise of prices among the groups previously most active. As a result, the general price advance quite definitely changed its character during August and September. Low-priced commodities—raw materials, notably raw farm products, foods, consumption goods not yet fabricated—declined or advanced but slightly, while goods already relatively high-priced—manufactured goods, non-foods, goods other than raw farm products, finished consumers' goods—took the lead in the price advance. Retail prices, particularly prices of clothing and house-furnishings and prices paid by farmers, rose sharply. The advance in living costs over these two months exceeded the rise in wholesale prices. The per-unit purchasing power of farm products declined in August and September, and the purchasing power of the per-capita earnings of manufacturing employees was reduced in September. At the end of that month price disparities, among major commodity groups, were on the whole wider than they had been in July.

The net change in price relations between February and September, 1933, was distinctly favorable to a general restoration of economic activity. But the picture is more clouded and uncertain than a survey of these net movements alone would indicate. The reversal, between July and September, of earlier tendencies within the price structure raises some pressing questions, questions which are given added weight by industrial changes connected with the enforcement of the National Recovery Act. These changes, notably the enforcement of minimum wages and the shortening of hours, may have, as first effect, a raising of industrial costs. It is the hope of those administering the Act that such higher costs, if actually realized, may be carried without an enhancement of prices. Greater volume will enable fixed charges to be spread over a larger number of units, so that overhead costs per unit of product may be reduced if sales and output are expanded. It is hoped that such an increase in volume may be maintained through increase in wage disbursements, and through an increase in farm income. But if the effect of these changes is to enhance, relatively, the prices of finished goods ready for consumption and of goods intended for use in capital equipment, the progress of economic recovery will not be facilitated.

We may not say that certain precise relations among elements of the price structure are essential to economic recovery, but major disparities created over a short four-year period may properly be looked upon as barriers to normal activity—barriers in themselves, or in the cost, income and purchasing power relations they represent. Such price disparities still exist, disparities wider than those prevailing after some of the most severe recessions of the past. The problem of correcting these disparities is less acute, in degree, than it was last February, but it remains urgent.

This central problem of price recovery has taken on a new aspect during October. The net movement of wholesale prices during the first three weeks of this month was a declining one, with structural changes in price relations apparently continuing the tendencies prevailing in August and September. The announcement of the Administration's new monetary policy in-

---

1 may constitute real barriers, in a positive sense, to a prompt restoration of full economic activity.

References in the text to price disparities, in relation to the problem of restoring working physical relations among the elements of our economic life, are to be interpreted with this general statement in mind.

jected novel elements into the situation. The possible effects of this policy upon the general level of domestic prices and upon international price relations have been widely discussed. Of equal or greater concern, as regards the current production and exchange of goods and the economic status of different producing groups in the United States, is the effect of this move on the structure of domestic prices. How will the forces brought into play under the new policy impinge upon the price system? What elements of that system will react first, and in what degree? What effect will these movements have upon the price relations which have developed during the last four years? Will the changes to be expected produce a price structure more or less balanced than that now existing, more or less favorable to a resumption of normal economic activity?

Much attention has been given to the relation of the price level to the existing debt structure. This is, beyond question, a matter of central importance, as regards the equity of debtor-creditor relations, and the problem of general economic readjustment. Of no less profound concern are the relations prevailing among elements of the price structure at a given time. These have a direct and immediate bearing on the continuing operation of our productive and distributive mechanisms. Both sets of relations are involved in the monetary program which has now been launched.

APPENDIX TABLE

INDEX NUMBERS OF WHOLESALE PRICES[1]

Commodity group	*Index numbers*								
	July 1929	*Feb. 1933*	*March 1933*	*April 1933*	*May 1933*	*June 1933*	*July 1933*	*Aug. 1933*	*Sept. 1933*
All commodities	100.0	61.7	62.2	62.6	65.2	68.0	72.3	73.4	74.4
Raw materials	100.0	50.6	51.8	52.6	56.4	59.7	65.5	64.7	65.6
Manufactured goods	100.0	68.6	68.6	68.9	70.7	73.1	76.5	78.6	79.8
Foods	100.0	50.0	51.1	52.6	56.4	58.3	63.6	62.5	62.2
Non-foods	100.0	69.1	69.1	68.9	70.9	74.0	77.8	80.2	82.2
Products of American farms, raw	100.0	39.5	41.5	43.1	49.4	53.0	59.4	57.3	56.5
All other products	100.0	68.2	68.2	68.3	69.9	72.3	76.1	77.9	79.6
Producers' goods	100.0	59.5	60.4	60.9	64.5	67.3	72.1	72.4	73.4
Consumers' goods	100.0	64.4	64.5	64.7	66.4	68.8	72.7	74.5	75.7
Producers' goods	100.0	59.5	60.4	60.9	64.5	67.3	72.1	72.4	73.4
Raw	100.0	49.1	50.7	51.7	56.3	59.3	64.6	63.4	65.0
Processed	100.0	71.4	71.3	71.6	73.6	76.2	80.5	82.4	82.8
For human consumption	100.0	45.8	47.6	48.8	54.7	58.3	64.6	64.1	64.3
For capital equipment	100.0	73.1	72.3	73.0	73.8	75.8	77.8	78.6	79.3
For building materials	100.0	75.9	76.3	76.4	77.6	80.4	84.3	86.0	86.9
Consumers' goods	100.0	64.4	64.5	64.7	66.4	68.8	72.7	74.5	75.7
Raw	100.0	55.8	55.8	55.4	56.8	61.1	69.1	69.0	68.1
Processed	100.0	66.5	66.6	67.0	68.6	70.7	73.5	75.9	77.5
Producers' goods intended for human consumption									
Foods	100.0	40.2	43.0	45.0	50.9	52.5	59.0	56.4	55.9
Non-foods	100.0	51.1	52.1	52.5	58.4	63.8	69.8	71.4	72.4
Consumers' goods, processed									
Foods	100.0	59.0	59.4	60.6	63.3	64.1	66.5	66.3	66.8
Non-foods	100.0	73.2	73.0	72.7	73.4	76.6	79.9	84.4	87.2

[1] These index numbers have been constructed by the National Bureau of Economic Research from price quotations compiled by the United States Bureau of Labor Statistics. They are weighted aggregates of actual prices, with weights based on average quantities produced in 1927 and 1931.

THE BULLETIN

Dr. Mills, the editor of the *Bulletin*, contributes the fifth issue of 1933. Subscribers will welcome these data which supplement measurements contained in *Economic Tendencies in the United States*.

It is expected that the report on National Income, 1929-1932, upon which the National Bureau is collaborating with the United States Department of Commerce, will be presented to the United States Senate in January, 1934. As soon afterwards as possible, the National Bureau will issue a *Bulletin* presenting a summary of this report.

Early in 1934, two other numbers of the *Bulletin* will appear: one by Solomon Fabricant who will analyze the impact of the depression on the profits of all corporations, as revealed by official income tax data; the other by Charles A. Bliss who will deal with recent movements in production.

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

H. W. LAIDLER, *Chairman of the Board*
OSWALD W. KNAUTH, *President*
JOSEPH H. WILLITS, *Vice-President*
GEORGE E. ROBERTS, *Treasurer*
CHARLES A. BLISS, *Executive Secretary*

Research Staff

WESLEY C. MITCHELL, *Director of Research*
ARTHUR F. BURNS
SIMON KUZNETS
FREDERICK C. MILLS
FREDERICK R. MACAULAY
LEO WOLMAN
EUGEN ALTSCHUL, *Associate*

Directors at large

OSWALD W. KNAUTH
H. W. LAIDLER
SHEPARD MORGAN
L. C. MARSHALL
GEORGE O. MAY
ELWOOD MEAD
GEORGE SOULE
N. I. STONE
MATTHEW WOLL

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

HUGH FRAYNE, *American Federation of Labor*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
A. W. SHAW, *National Publishers Association*
ROBERT B. WOLF, *American Engineering Council*

APPOINTMENT OF EUGEN ALTSCHUL

The generosity of the Maurice and Laura Falk Foundation of Pittsburgh, Pennsylvania, enables the National Bureau of Economic Research to bring Eugen Altschul, formerly of the University of Frankfurt, to this country as an associate on its research staff for one year.

Dr. Altschul already has associations with the National Bureau as the director of the Frankfurter Gesellschaft für Konjunkturforschung and as the Editor of the German translation of Dr. Mitchell's *Business Cycles: The Problem and Its Setting.* The series of seventeen publications of this organization under the editorship of Dr. Altschul includes a volume (No. 7) by Dr. Simon Kuznets of the National Bureau staff, entitled *Wesen und Bedeutung des Trends.*

For the past few months Dr. Altschul has been in London assisting Sir William Beveridge on the English section of the international investigation of price histories. His presence on the research staff of the National Bureau makes possible the addition of a special analysis of agricultural movements to its studies of business cycles.

IN PRESS

Production Trends in the United States Since 1870, by Arthur F. Burns; 350 pp., 21 charts, 54 tables; $3.50.

The National Bureau announces the publication in November of *Production Trends in the United States Since 1870* as Volume 23 of its series of research reports.

This study, which was made by one of the 1931-32 research associates at the National Bureau, is now in page proof and will be distributed to subscribers at an early date.

Dr. Burns' book presents the results of an intensive study of the production trends of individual industries and of the trend of total production. Dr. Burns finds that the rates of growth of individual industries decline as their age increases; that the economic system is characterized by major cyclical swings, and that these major swings are related to business cycles. The study of individual commodities is supplemented by a detailed analysis of production indexes.

The volume includes a summary chapter by Dr. Mitchell. Also, a complete tabulation of over one hundred production series—many of them inaccessible to most students—is given in an appendix.

In his introduction Dr. Mitchell says that the reader will find in this volume "the most important contribu-

---

NATIONAL BUREAU OF ECONOMIC RESEARCH
51 Madison Avenue, New York, N. Y.

Gentlemen:

Kindly send me, post-paid, *Production Trends in the United States Since 1870,* by Arthur F. Burns, in payment for which I enclose a check for $3.50.

Name .....

Address .....

This report, and all others published within a twelve-month period by the National Bureau, may be secured for $25. See the enclosed subscription blank for our special offer.

tion to our knowledge of increase in production which has been made since Mill wrote."

Dr. Burns has been appointed a member of the research staff of the National Bureau to assist Dr. Mitchell on his forthcoming volume on business cycles.

Strategic Factors in Business Cycles, by John Maurice Clark; 200 pp., $1.50.

Professor Clark's report to the Committee on Recent Economic Changes, which the National Bureau is publishing, is in galley proof. Orders are now being filed.

The volume is composed of six Parts:

I. Theoretical Approach to the Problem
II. Typical Cycle Patterns
III. General Movement, 1922-1929
IV. Special Features of the Last Cycle
V. Another Approach: Meaning and Requirements of Balance
VI. The Strategic Factors

There will be an introduction by the Committee on Recent Economic Changes.

PUBLICATIONS, 1921-1933

*1 INCOME IN THE UNITED STATES
By Wesley C. Mitchell, Willford I. King, Frederick R. Macaulay and Oswald W. Knauth
Volume I (1921) Summary 152 pp.

2 *Volume II* (1922) Details 440 pp.

3 DISTRIBUTION OF INCOME BY STATES IN 1919 (1922)
By Oswald W. Knauth 30 pp., $1.30

4 BUSINESS CYCLES AND UNEMPLOYMENT (1923)
By the National Bureau Staff and 16 Collaborators 405 pp., $4.10

*5 EMPLOYMENT, HOURS AND EARNINGS IN PROSPERITY AND DEPRESSION, UNITED STATES, 1920-22 (1923)
By Willford I. King 147 pp.

6 THE GROWTH OF AMERICAN TRADE UNIONS, 1880-1923 (1924)
By Leo Wolman 170 pp., $2.50

7 INCOME IN THE VARIOUS STATES: ITS SOURCES AND DISTRIBUTION, 1919, 1920 AND 1921 (1925)
By Maurice Leven 306 pp., $3.50

8 BUSINESS ANNALS (1926)
By Willard L. Thorp, with an introductory chapter, Business Cycles as Revealed by Business Annals, by Wesley C. Mitchell 380 pp., $2.50

9 MIGRATION AND BUSINESS CYCLES (1926)
By Harry Jerome 256 pp., $2.50

10 BUSINESS CYCLES: THE PROBLEM AND ITS SETTING (1927)
By Wesley C. Mitchell 489 pp., $5.00

*11 THE BEHAVIOR OF PRICES (1927)
By Frederick C. Mills 598 pp.

12 TRENDS IN PHILANTHROPY (1928)
By Willford I. King 78 pp., $1.00

13 RECENT ECONOMIC CHANGES (1929)
By the National Bureau Staff and 15 Collaborators 2 vol., 950 pp., per set, $7.50

14 INTERNATIONAL MIGRATIONS
Volume I, Statistics (1929), compiled by Imre Ferenczi of the International Labour Office and edited by Walter F. Willcox 1,112 pp., $7.00

18 *Volume II, Interpretations* (1931) edited by Walter F. Willcox 715 pp., $5.00

*15 THE NATIONAL INCOME AND ITS PURCHASING POWER (1930)
By Willford I. King 394 pp.

16 CORPORATION CONTRIBUTIONS TO ORGANIZED COMMUNITY WELFARE SERVICES (1930)
By Pierce Williams and Frederick E. Croxton 347 pp., $2.00

17 PLANNING AND CONTROL OF PUBLIC WORKS (1930)
By Leo Wolman 260 pp., $2.50

19 THE SMOOTHING OF TIME SERIES (1931)
By Frederick R. Macaulay 172 pp., $2.00

20 THE PURCHASE OF MEDICAL CARE THROUGH FIXED PERIODIC PAYMENT (1932)
By Pierce Williams 308 pp., $3.00

21 ECONOMIC TENDENCIES IN THE UNITED STATES: ASPECTS OF PRE-WAR AND POST-WAR CHANGES (1932)
By Frederick C. Mills 639 pp., $5.00

22 SEASONAL VARIATIONS IN INDUSTRY AND TRADE (1933)
By Simon Kuznets 455 pp., $4.00

* *Out of print.*

National Bureau of Economic Research

BULLETIN 50

APRIL 18, 1934

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Recent Corporate Profits in the United States

SOLOMON FABRICANT

Copyright 1934, National Bureau of Economic Research, Inc.

THE low point in profits during the depression, according to the published statements of large corporations, was reached in the first quarter of 1933. With the rise in the volume of business, and in the level of prices, deficits decreased and net incomes increased in the succeeding quarters of the year (with a temporary halt in the last quarter), and there are indications of a continuance of these movements in more recent months.

But since current figures are of necessity confined to the reports of the larger companies, they do not indicate accurately the profits or losses of all corporations in the United States. At best, they indicate the direction of movement in the current state of fortune or misfortune of American corporations. The amount of fall or rise can be accurately ascertained only from the compilations of income tax reports made by the United States Bureau of Internal Revenue; but these are published in final form almost two years after the year to which they refer. This part of the story of the depression, therefore, cannot be told in any complete form at this time. However, final figures are now available for the period through 1931, and estimates may be made for 1932 from preliminary reports recently published by the income tax division.

The data compiled by the Bureau of Internal Revenue not only provide the facts as to profits; they also give a composite picture of operations not generally made available even by the large corporations that publish financial statements. The details regarding receipts and deductions, included in the aggregate income account of all corporations, help to throw light upon the methods underlying the computations of profits. The nature of the accounting estimates of profits, and the approximative character of the reported figures on corporate earnings, may be made clearer by a study of these materials. The present *Bulletin* is based upon these comprehensive Federal data.[1]

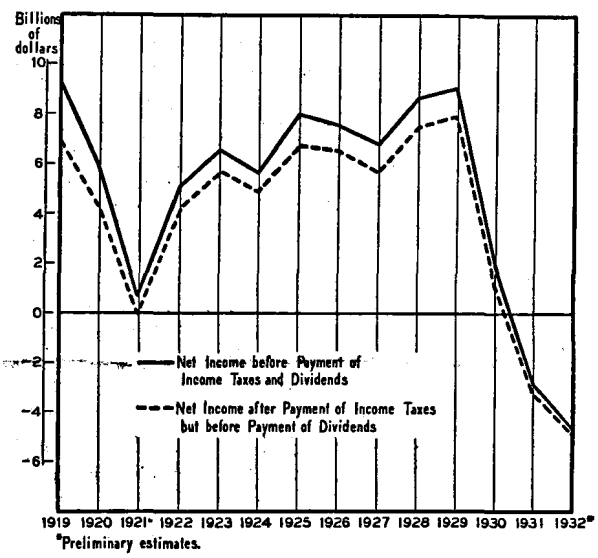
PROFITS OF ALL CORPORATIONS IN THE UNITED STATES

The course of aggregate profits of American corporations for the period 1919-32 is shown in Table 1 and presented graphically in Figure 1. The figures are those reported, for income tax purposes, to the Treasury Department. Income and profits taxes are also given for the same period, together with net profits after deducting these payments.

Figure 1

AGGREGATE NET INCOME

ALL CORPORATIONS IN THE UNITED STATES



[1] Preliminary figures for 1932 were given by Professor R. C. Epstein in Industrial Profits in Prosperity and Depression, 1919-1932, *Bulletin 44* of this series. These figures, which were confined to ratios of net earnings to capitalization, related to a sample of 71 large industrial corporations, not to all corporations in the United States.

Table 1

AGGREGATE NET INCOME OF ALL CORPORATIONS IN THE UNITED STATES, 1919-1932

(Excluding tax-exempt corporations and life insurance companies)

(*In millions of dollars*)

Year	*Aggregate net income before payment of income taxes and dividends*[1]	*Income- and profits- taxes paid*[2]	*Aggregate net income after payment of income taxes but before payment of dividends*
1919	9,320	2,410	6,910
1920	5,920	1,640	4,280
1921	640	710	—70
1922	5,070	770	4,300
1923	6,640	920	5,720
1924	5,740	870	4,870
1925	7,990	1,160	6,830
1926	7,840	1,210	6,630
1927	6,840	1,110	5,730
1928	8,670	1,170	7,500
1929	9,130	1,180	7,950
1930	1,960	700	1,260
1931	—2,850	390	—3,240
1932[a]	—4,600	330	—4,930

[a] Preliminary estimates.

[1] Statutory net income plus tax-exempt interest, adjusted to secure comparability (see Ebersole, Burr and Peterson, *Review of Economic Statistics*, November 1929, p. 180). Life insurance companies, which do not report their entire net income, have been excluded.

[2] Corrected for shortage in tabulation (see *Review of Economic Statistics*, November 1929, p. 180).

The duplication in profits due to intercorporate payments is avoided by the exclusion of dividends received from other corporations. However, there remains some duplication of losses due to the failure of companies whose capital stock is held by other corporations. In this case a loss may be reported both by a corporation being liquidated and by a company holding its stock, though the reports would not necessarily be made in the same year. There is some additional understatement of the true amount of profits because of a tendency, for the smaller companies at least, to distribute a portion of net income in the form of salaries or other compensation to stockholders (chiefly officers) to avoid taxes and for other reasons. We should note further that the figures in Table 1 do not include the earnings of tax-exempt corporations, such as cooperative, charitable, educational, and labor organizations, and Federal land banks, which are not required to report their net incomes. Life insurance companies are subject to tax only upon part of their income, and for this reason they have been excluded.

All the depressions which have afflicted American business since the World War are reflected clearly in the fluctuations of profits. The crash in 1920 and the deep trough of 1921, the slight depressions of 1924 and 1927, and the great collapse in 1930-32 are all graphically depicted.[3]

The huge aggregate deficit sustained in 1931 and 1932 does not mean, of course, that all corporations suffered a loss. This deficit is the figure obtained by combining the net incomes of corporations reporting such net incomes with the losses of 'no-income' corporations. (The details for 1927-32 are shown in Table 2.) Lack of taxable net income, be it noted, is not necessarily equivalent to absence

[3] The trend in the rate of profit, however, is not accurately shown here, since changes in invested capital are not taken into account. There are available no reliable figures indicating the movement in the net worth of all corporations in the United States for this entire period.

Table 2

NET INCOMES OF 'INCOME' CORPORATIONS AND DEFICITS OF 'NO-INCOME' CORPORATIONS, 1927-1932[1]

All Corporations in the United States

(Excluding tax-exempt corporations and life insurance companies)

	'Income' Corporations		*'No-Income' Corporations*		*All Corporations*	
Year	*Number of returns in thousands*	*Net income*[2] *in millions of dollars*	*Number of returns in thousands*	*Net deficit*[2] *in millions of dollars*	*Number of returns in thousands*[3]	*Aggregate net income or deficit*[2] *in millions of dollars*
1927	259	9,220	166	—2,380	425	6,840
1928	268	10,950	175	—2,280	443	8,670
1929	269	11,930	187	—2,800	456	9,130
1930	221	6,640	242	—4,680	463	1,960
1931	176	3,760	284	—6,610	460	—2,850
1932[a]	81	2,400	366	—7,000	447	—4,600

[a] Preliminary estimates.

[1] Consolidated returns are taken to represent one company. Changes that occurred in the relative number of consolidated reports probably affect but slightly the distribution of companies between the two groups shown.

[2] Statutory net income plus tax-exempt interest, or statutory deficit minus tax-exempt interest.

[3] Excluding inactive corporations.

Table 3

RATE OF RETURN ON BOOK VALUE OF STOCK EQUITY, 1927-1932

All Corporations in the United States

(Excluding tax-exempt corporations and life insurance companies)

	Ratio of Net Profits after Tax to Book Value of Stock Equity,[1] in Percentage Form						*Ratio of Net Profits after Tax, plus Compensation of Officers,[2] to Book Value of Stock Equity,[1] in Percentage Form*			
Industrial group	*1927*	*1928*	*1929*	*1930*	*1931*	*1932**	*1928*	*1929*	*1930*	*1931*
Agriculture and related industries	1.3	2.2	1.4	—2.8	—5.2	—5.9	3.7	3.1	—1.1	—3.9
Mining and quarrying[3]	0.7	1.8	2.7	—0.0	—2.7	—2.2	2.5	3.2	0.6	—2.1
Manufacturing	6.2	7.6	8.3	2.6	—1.0	—2.5	9.7	10.5	4.7	0.8
Construction	9.9	7.4	7.4	5.4	—1.0	—7.3	19.1	18.5	15.6	8.6
Public utilities and transportation	4.8	5.1	5.8	3.6	2.0	0.6	5.4	6.1	3.8	2.2
Trade	5.5	6.4	4.9	—0.5	—4.5	—6.7	12.8	11.7	6.1	1.8
Service	4.0	4.1	3.8	1.8	—2.3	—10.8	10.2	8.2	6.3	2.5
Finance and real estate	5.6	6.4	5.3	1.6	—1.8	—2.8	8.3	6.8	3.0	—0.4
Grand total[4]	5.3	6.2	6.2	2.2	—0.8	—2.3	8.2	8.1	4.0	0.9
Manufacturing subgroup										
Foods, beverages and tobacco	6.7	7.9	7.7	6.3	3.9	2.0	9.8	9.5	8.3	5.8
Textiles and products	5.4	3.5	2.9	—5.8	—6.4	—7.2	7.2	6.9	—1.7	—2.4
Leather products	7.4	4.8	3.9	—3.2	—4.9	—8.0	8.6	7.8	0.7	—1.1
Rubber products	5.1	0.3	2.5	—4.4	—2.4	—5.9	1.5	3.7	—3.4	—1.3
Lumber products	1.0	2.4	2.4	—4.5	—8.3	—9.8	5.2	5.2	—1.9	—5.9
Paper, pulp and products	6.7	7.1	6.4	2.9	—0.5	—3.8	9.5	8.5	4.9	1.3
Printing and publishing	9.7	11.9	11.5	7.6	2.2	—1.0	18.3	18.0	13.6	7.4
Chemicals and allied products	5.4	9.1	9.9	5.0	1.1	1.2	10.0	10.7	5.8	1.7
Stone, clay and glass products	6.2	6.5	6.2	1.8	—2.0	—5.1	8.8	8.7	3.9	0.1
Metal and its products	7.1	8.8	10.9	3.3	—2.1	—3.9	10.5	12.7	4.9	—0.6
Manufacturing not elsewhere classified	6.1	7.5	5.7	—0.7	—4.4	—6.3	11.6	9.5	3.0	—0.5
Total manufacturing	6.2	7.6	8.3	2.6	—1.0	—2.5	9.7	10.5	4.7	0.8

* Preliminary estimates.

[1] The balance-sheet figures published in *Statistics of Income* have, on the basis of estimates, been raised to include corresponding items of corporations not making balance-sheet reports. Book values are as of the end of the year, except for 1932, for which 1931 values have been used.

[2] Data for 1927 and 1932 are not available.

[3] See text, footnote 7.

[4] Includes a small group of corporations not reporting the nature of their business.

of profits. Many corporations never have any book profits and yet continue to operate indefinitely.[5]

PROFITS BY INDUSTRIAL DIVISIONS

Differences in the effects of the depression upon the profits of industrial groups may be revealed if some common basis of measuring profits be employed. The amount of invested capital is a desirable basis for this comparison. (It should be noted that the materials available give book values of capital rather than invested capital. It is doubtful, however, if the differences involved[6] are sufficiently great to vitiate *broad* comparisons among industries.) The total of preferred and common capital stock outstanding, together with surplus less deficits, has been taken to indicate the amount of invested capital; net profits after tax (but including dividends received) have been used as a measure of earnings. Since we are here interested in the profits accruing to stockholders, rather than in the

[5] That corporations persistently remain in the 'no-income' group is suggested by the low ratio of prior-year losses deducted in computing income taxes to aggregate deficits reported in preceding years (after allowance is made for companies that have been dissolved), even in years of growing prosperity. These no-income corporations would include those in which officers' compensation absorbs the entire profit, subsidiary companies that transfer their products to parent companies at cost or even at a loss, corporations established to avoid taxes, and mining companies that benefit from the peculiar depletion provisions of the tax laws (see footnote 7).

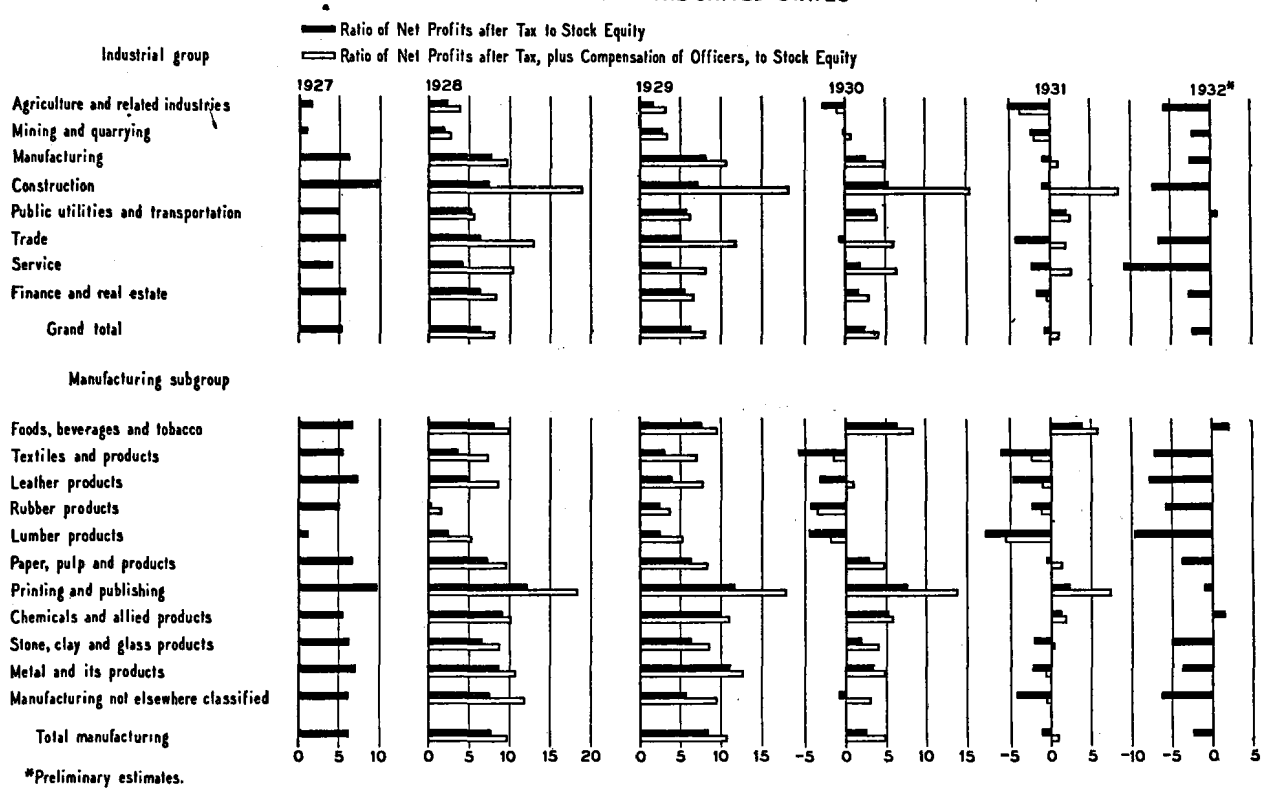
[6] Differences, from one company to another, in policies relating to depreciation, obsolescence, revaluation of assets in response to changes in price levels, and capitalization of earning power, affect the comparisons made below. The variations in the ratios given, however, are probably too great to be accounted for solely by these differences in valuation procedure.

In considering the movements from one year to another allowance must be made for some probably general write-ups of assets in 1928-29 and write-downs in 1931-32.

Figure 2

RATE OF RETURN ON BOOK VALUE OF STOCK EQUITY

ALL CORPORATIONS IN THE UNITED STATES



*Preliminary estimates.

earnings of all the capital invested in corporate activities, long-term and other obligations have been omitted from our measure of capital, and only profits available for dividends have been taken to represent earnings. Dividing earnings, so measured, by capital invested, as indicated by the balance sheets submitted, we obtain the earnings rates presented in the first half of Table 3 and illustrated graphically in Figure 2.[5] The figures for some of the industrial groups may not be quite representative since consolidated returns are classified according to the principal business of the group of corporations covered by each of these reports. This consideration probably applies chiefly to mining and quarrying.

There is considerable variation from industry to industry in the importance of salaries, bonuses and other payments to officers (who, in the smaller companies, are usually the chief stockholders). This, of course, results from the differences in average size of corporation from one industry to another. In the textile manufactures group, for example, average total net assets per balance sheet filed in 1929 was $480,000. On the other hand, among the public utilities the corresponding figure was almost ten times as great, amounting to

[5] The duplication due to intercorporate holdings has been eliminated to a considerable extent through the filing of consolidated returns. The data published do not indicate clearly the remaining investments in other corporations, or, with the exception of dividends received, the income from such investments. However, since the duplication occurs both in the numerator and in the denominator of the earnings ratio, it has but little effect upon the comparisons among industries.

If we attempt to take account of the fact that dividends received by corporations on stocks held may be more or less than the earnings of the companies whose securities are being held, we have the figures for all corporations shown in the last column below. The estimate assumes investments to be only in stocks of large corporations: consolidated corporations for the period 1928-30, and companies with assets exceeding 10 million dollars for the year 1931. (Data are available for neither group for the entire period, and are unavailable for both groups for 1927 and 1932.) The ratios obtained after excluding dividends received, but before including earnings accrued on stocks owned, are also given.

Net profits after tax, as a ratio of stock equity (in percentage form)

	Including dividends received	*Excluding dividends received*	*Including total earnings accrued on stocks owned*
1928	6.2	5.0	6.9
1929	6.2	4.7	7.0
1930	2.2	0.8	1.5
1931	—0.8	—2.0	—2.0

$4,500,000. Since compensation received by officers includes, to some extent, a distribution of profits, the varying incidence of the depression upon income accruing to stockholders in different industries cannot be traced in reported net incomes alone. It is necessary to compare rates of return after allowance has been made for differences in the importance of this item. In the second half of Table 3 net profits after tax have been combined with compensation of officers, and the percentage relation of the sum to the total equity of stockholders given. These figures also are charted in Figure 2. It is apparent that the relative positions of certain industrial groups are altered when account is taken of officers' compensation. The true industrial differences in earnings can be seen only by a consideration of the entire table and chart. The correct earnings ratio, for a given year, lies between the two figures for each industry, and probably closer to the first (in which officers' compensation is not included).[6]

These rates of return, it must be remembered, are weighted averages. They do not refer to the return earned, on the average, by individual companies within the groups shown. They represent the return earned per dollar of invested capital (the latter being measured by the book value of stock equity).

Even before 1930 the rates of profits of certain industrial groups were low. Corporations engaged in manufacturing textiles, rubber products and lumber products, and in mining[7] and agriculture were, on the whole, relatively depressed in the prosperous years 1928 and 1929. When the collapse occurred they were among the first to report deficits. Only the rates of return of a few groups, among them chemicals, metals and public utilities, rose appreciably with the cyclical upturn from 1927 to 1929. Profits in construction were already declining, owing to the decrease in volume of building; the profits of corporations engaged in leather manufactures were also falling. Not until 1931, however, did the number of groups reporting deficits exceed the number reporting profits. By 1932 only three industrial groups, foods and tobacco, public utilities, and chemicals, were enjoying the distinction of an aggregate net profit (after tax). However, printing and publishing corporations reported only slight deficits, in the aggregate. If the group 'foods, beverages, and tobacco' is broken down into 'foods and beverages' and 'tobacco', as is possible for 1931 and 1932, the first subgroup no longer shows a net profit for 1932. Corporations engaged in manufacturing tobacco products continued, however, at a profitable rate.

When account is taken of compensation of officers, the differences shown are somewhat modified. Some groups that appeared especially depressed are those in which payments to officers have bulked large, relatively to net worth. This is true of textiles, trade and service. In printing and publishing, and construction, the already high rates of return (on book value of capital) are raised to even higher levels. Of course, in all these industries payments to officers represent only in part distributions of profits. To a large extent they are actual costs. But because in many corporations they are made at least partially in lieu of dividends, it is necessary to consider them in comparing the rate of return of one industry with that of another.

PROFITS BY SIZE OF CORPORATION

Since published income accounts and balance sheets are almost entirely those of large corporations, figures obtained from them cannot be taken to represent the current fortunes of all companies. However, any possible differences are of interest. A comparison of the earnings rates derived from the Treasury Department statistics with those based upon currently published figures should indicate how large corporations have fared during the depression, relatively to all companies. Table 4 contains the figures for 1929-32. (Data for large corporations, now available for 1933, are also presented in the table.) We are interested in the relative position of large companies as a group; therefore we need not concern ourselves with the fact that the industrial compositions of the two series here compared differ.

[6] We may be sure that just as the simple comparison based upon profits understates the true profitability (notably in the case of small companies) so the comparison based upon profits and compensation of officers overstates the true profitability; for a large part of the total officers' compensation clearly represents labor cost proper. This consideration applies especially to the rate of return as it is commonly conceived of in business and financial circles.

In a deeper sense, however, profits cannot be separated from the wages of management; economists have generally found the line between profits and the wages of management and enterprise indistinct. In studying profitability by industry or size of company, therefore, it is necessary to base comparisons upon the sum of these two quantities. In lieu of a perhaps more exact measure of size in this comparison (such as 'value added' or gross income less cost of raw materials) net worth has been used. The resulting ratio, that of the sum of net profits after tax and compensation of officers to total stock equity, is an approximation to an index of profitability in the economic sense. In this sense it is not necessarily an upper limit. Since in this case the ratio represents an index rather than a direct measure, the absolute size of the ratio for a given group of companies is of less significance than its relative size.

[7] The incomes reported for tax purposes by mining corporations are not necessarily entirely correct measures of profits for our purposes, since allowable deductions for depletion may exceed cost of the property being depleted (see Article 221, *Regulations 77*, Bureau of Internal Revenue). This qualification also applies, but with less weight, to the net incomes of other corporations deducting depletion charges, especially those in the petroleum industry, which are included in the chemical manufacturing group.

Table 4

RATE OF RETURN ON BOOK VALUE OF STOCK EQUITY, 1929-1932

Large Corporations Contrasted with All Corporations

Ratio of net profits after tax to book value of preferred and common stock and net surplus, in percentage form

Group	*1929*	*1930*	*1931*	*1932*	*1933*
All industries					
All corporations[1]	6.2	2.2	—0.8	—2.3*	
Large corporations[2]					
1,620 corporations	11.3	6.0	2.6		
1,810 corporations			2.4	0.2	
1,925 corporations				0.3	2.1
All industries except public utilities and finance					
All corporations[1]	6.7	1.8	—1.9	—3.9*	
Large corporations[2]					
1,302 corporations	13.5	6.7	2.5		
1,410 corporations			2.5	—0.4	
1,475 corporations				—0.4	2.6

* Preliminary estimates.

[1] See Table 3.

[2] Figures published by the National City Bank in its monthly bulletins. While every effort is made by the National City Bank to include the smaller companies, the sample naturally covers more completely the larger concerns and therefore may, for the present purpose, be considered a sample of large corporations.

The differences shown, which are large, may be due in part to differences in accounting practice. If compensation of officers be added to the income of all corporations in measuring the rate of return, the differences still persist, although they are not so wide.

For the one year 1931 a new compilation recently released by the Treasury Department[3] makes it possible to compute rates of return for corporations grouped according to size. The figures appear in Table 5. (They are derived from aggregates and may therefore be interpreted only as weighted averages for the several groups.)

[3] *Statistics of Income for 1931* (1934), pp. 154-5.

The situation revealed is striking. In the depression year 1931 the only group of companies earning an aggregate profit was that composed of corporations with assets of over 50 million dollars. These companies (not including subsidiaries) numbered only 632 out of the 381,000 reporting balance sheets. Together with subsidiaries they owned 155 billions of assets out of a total of 296 billion reported.[4] The progression in the rate of return from the small- to the large-size groups is impressive. Yet it is doubtful if companies with assets averaging under $50,000 lost as much as the indicated 20 per cent, even in 1931. If we combine officers' compensation with profits, those concerns owning between $500,000 and $10,000,000 in assets appear to have the lowest returns. Still, not all of officers' compensation consists of profits. If we assume even as much as one-half to be profits (a figure undoubtedly larger

[4] For the first time an accurate distribution of American corporations by size is available. Because of its interest, it is reproduced here. (The figures relate to 1931.)

Size group (total net assets in thousands of dollars)	*Number of corporations (as percentage of total)*	*Total net assets (as percentage of total)*
Under 50	47.9	1.2
50 — 100	16.0	1.5
100 — 250	16.6	3.4
250 — 500	8.1	3.7
500 — 1,000	5.1	4.6
1,000 — 5,000	4.8	12.8
5,000 — 10,000	0.7	6.0
10,000 — 50,000	0.6	14.6
50,000 and over	0.2	52.2
Total	100.0	100.0

The above figures relate only to corporations reporting balance sheets (83 per cent of the total). Most of the companies not reporting are small.

Table 5

EARNINGS OF CORPORATIONS IN THE UNITED STATES,[1] 1931

Classified by Size

Size (*total net assets in thousands of dollars*)	Number of reporting corporations	Aggregate net profits after tax	Aggregate compensation of officers	Aggregate net profits after tax plus compensation of officers	Aggregate net profits after tax, relative to total stock equity	Aggregate net profits after tax, plus compensation of officers, relative to total stock equity
		(*in millions of dollars*)			(*in percentage form*)	
Under 50	182,447	—415	520	105	—21.7	5.5
50 — 100	61,144	—218	312	94	—9.1	3.9
100 — 250	63,428	—353	433	80	—6.5	1.5
250 — 500	31,052	—268	296	28	—4.6	0.5
500 — 1,000	19,335	—271	235	—36	—3.9	—0.5
1,000 — 5,000	18,345	—591	353	—238	—3.0	—1.2
5,000 — 10,000	2,588	—166	99	—67	—1.8	—0.7
10,000 — 50,000	2,117	—104	161	57	—0.5	0.3
50,000 and over	632	1,507	163	1,670	+2.2	2.4

[1] Excluding corporations not reporting balance sheets.

than the correct fraction), the relative positions of the different groups (as indicated by net profits only, relative to equity) remain substantially unchanged.

These results require further verification. If the ratio to total assets of the sum of net profits after tax and interest paid is taken as the measure of earnings, the ranks of the various groups are also unchanged. This is true, in addition, if the figures in Table 5 are adjusted for the accrual of earnings on stocks owned (as in footnote 5). It is doubtful whether the fact that some large (parent) companies might have been profiting at the expense of their small subsidiary companies is sufficient to explain the differences noted. However, there may be a greater concentration of relatively inactive corporations with low rates of return among those of small size; but completely inactive companies are omitted. The large end-classes (under 50 thousand dollars of assets per corporation, and 50 million and over) tend to obscure the relationship.

The difficulty of measuring profitability (a difficulty inherent in the common notion of profits) appears here in especially acute form. The distinction between net profits reported as such and net profits included in other items (of which compensation of officers is one) is vague. In addition, capital is not necessarily the best means of reducing profits to a common base, since profits accrue also to functions other than the ownership of assets. An alternative base, gross income less cost of raw materials, is not available.

The largest corporations in most of the industrial groups reported a net profit for 1931. The exceptions were in agriculture, mining, and in the manfacturing of textile, forest, paper and rubber products. But space does not admit of the presentation, by industrial groups, of figures similar to those in the sixth column of Table 5. The differences in rates of return according to size, noted above in the case of all industries, are visible also within each industry. Further, the representativeness of the average rates of return of individual industries shown in Table 3 finds considerable support in a comparison of similar size-groups.

THE AGGREGATE INCOME ACCOUNT OF ALL CORPORATIONS

The change in profits during the last cycle is correctly viewed only in the income account as a whole. Net income, after all, is but an estimate, the difference between the gross income of a given period and the costs charged to that period. The nature of the profit estimate cannot be understood without a consideration of the individual elements included and the methods of their computation. For the period 1927-31 there is available a fairly consistent and detailed set of data, giving corporate receipts and some of the important items of deduction. Combined figures for all corporations are presented in Table 6; these are given both in dollars and as percentages of 1929.

'Miscellaneous receipts' are primarily those of corporations in industries not selling physical commodities. These include public utilities, railroads, financial companies, service companies, and others. A fraction of this item represents gross profits on those sales of goods not reported, es-

Table 6

AGGREGATE INCOME ACCOUNT, 1927-1932

All Corporations in the United States

(Excluding tax-exempt corporations and life insurance companies)

	In millions of dollars						*As percentages of 1929*					
	1927	*1928*	*1929*	*1930*	*1931*	*1932**	*1927*	*1928*	*1929*	*1930*	*1931*	*1932**
Receipts												
Gross sales reported	106,860	112,440	118,100	97,940	75,500		90.5	95.2	100.0	82.9	63.9	
Less: Cost of goods sold	83,490	87,260	91,080	76,190	58,770		91.7	95.8	100.0	83.7	64.5	
Gross profits on gross sales reported	23,370	25,180	27,020	21,750	16,730		86.5	93.2	100.0	80.5	61.9	
Miscellaneous receipts, and gross profits other than on gross sales reported	35,630	38,200	39,670	35,150	29,640		89.8	96.3	100.0	88.6	74.7	
Total[1]	59,000	63,380	66,690	56,900	46,370	33,300	88.5	95.0	100.0	85.3	69.5	50.0
Deductions												
Compensation of officers	3,060[2]	3,200	3,340	3,140	2,700		91.7[2]	95.9	100.0	94.1	80.8	
Interest paid	4,370	4,570	4,920	4,850	4,480		88.9	93.0	100.0	98.7	91.1	
Domestic taxes	2,010	2,200	2,210	2,280	2,220		90.6	99.2	100.0	103.2	100.1	
Income taxes	1,110	1,170	1,180	700	390		94.3	99.1	100.0	59.2	32.9	
Bad debts	810	800	940	980	1,180		86.4	85.4	100.0	103.9	125.6	
Depreciation	3,340	3,590	3,860	3,980	3,990		86.5	93.0	100.0	103.0	103.3	
Depletion	500	520	560	460	270		89.9	92.1	100.0	82.8	47.9	
Losses on sale of capital assets				940	1,700							
Other deductions	38,070	39,830	41,730	38,310	32,680		91.2	95.4	100.0	94.0	82.4	
Total	53,270	55,880	58,740	55,640	49,610		90.7	95.1	100.0	94.7	84.5	
Net income	5,730	7,500	7,950	1,260	—3,240	—4,900	72.0	94.4	100.0	15.9	—40.8	—61.6

* Preliminary estimates.

[1] Excluding dividends received.

[2] Estimated (see Nerlove, *A Decade of Corporate Incomes*).

pecially sales by commission merchants, brokers, and some construction corporations. 'Other deductions' consist of all those important business expenses not included in the cost of goods sold or separately listed, such as costs of distribution and selling, office and administrative expense, and other general expenses.

The rise in total gross profits on sales and miscellaneous receipts was about 13 per cent from 1927 to 1929. From 1929 to 1931 the fall was drastic, amounting to 30 per cent. (Judging from preliminary returns the decline to 1932 was about 50 per cent.) Deductions, on the other hand, rose somewhat less in the period 1927-29; they also fell less in 1929-31. Profits, the volatile difference between gross receipts and deductions, jumped 39 per cent to 1929, and by 1931 had vanished. In 1931 aggregate losses amounted to 40 per cent of 1929 profits; in 1932, to 60 per cent of 1929 aggregate net earnings. But the items of deduction should be examined more closely to appreciate the significance of these figures.

The difficulties of accounting in a modern industrial society arise from at least two facts. First, price changes occur and must, somehow, be considered in business computations. They result in profits or losses on inventories, and in variation in the cost of replacement of equipment. Second, costs incurred in one period are accompanied by benefits that extend beyond that period. This makes it necessary to distribute the costs among the different accounting intervals over which these benefits extend. The difficulty of allocating depreciation is well recognized, since variations in the percentage of productive capacity used are plainly visible. Yet unused capacity exists in the case of other charges (such as those for rent, interest and taxes) even if in less obvious form. In considering the figures in Table 6 a recognition of these difficulties is essential.

These difficulties and the far-reaching consequences of various methods of coping with them may only be mentioned here. The income account in Table 6 represents the result of one method of accounting. But there are many theories of the apportionment of expenses, each giving rise to a different accounting technique, a different income account and a different estimate of net profits. The following analysis indicates how alternative methods of treatment might affect the figures; it is intended solely to throw some light upon the nature of the published figures of net profits, including those presented above. While it is impossible adequately to discuss here the underlying theories it is important to remind the reader that the significance of all the profits figures appearing in this *Bulletin* and elsewhere is definitely dependent upon such theories. The following discussion is designed to emphasize this fact. It finds its justification in the importance and interest inherent in the determination of profits in what has come to be called a 'profits-economy'.

Cost of goods sold, as reported for income tax purposes, includes wage costs and material costs (and some items of overhead). Although these costs did not exactly parallel gross sales during the period covered by Table 6, the gross margin (gross profit on sales) changed but slightly. From 22 per cent of sales in 1927 it increased to 23 per cent at the peak of 1929, and fell back to 22 per cent in 1931. (We must remember that this gross margin, which refers to a heterogeneous mixture of goods, may obscure wide industrial differences.) From 1927 to 1929 there was little change in wholesale prices. But after 1929 the price level began to decline rapidly, though not equally in all its parts, with resulting losses on stocks of goods held by corporations.[10] If cost of goods sold had been charged at replacement values, for example, rather than at original cost of production as in Table 6, gross income from sales would have been greater. The difference (the loss ascribed to price declines) would then be charged to profit and loss, with a resulting changed statement of operations. 'Operations', in any real sense, include the essential task of carrying stocks of goods. But it is worth while to distinguish among the different types of productive activity and related costs—in this case the physical task of production and the costs attendant thereon, and the task of carrying goods in process and the conjunctural profits or losses arising from it.

The opposite result would take place in a period of rising prices. Part of the gross profit on sales would then include profits due to increasing values of goods held. Operations for the year 1933 would therefore yield a smaller profit (or a greater loss) when calculated in this manner than would be indicated by the income tax reports.

Payments of interest and property taxes represent, to a great extent, costs of property only partially used in the depression years following 1929. While total receipts (less cost of goods sold) declined over 30 per cent from

[10] It is well known that selling prices do not fluctuate exactly as do prime costs, the major part of costs of goods sold. There is a tendency for changes in selling prices to lag behind corresponding changes in these costs. This would result in an increase in the gross margin per unit of product during a period of falling prices. (A further factor is the difference in the rapidity of decline of prices and costs.) On the other hand, production and distribution take time. Stocks of goods—raw materials, materials in process of fabrication, finished products—must be carried even though prices may be falling. In this case the gross margin tends to decline. Since the period of production and distribution is usually longer than the period of lag of prices after costs of goods sold, the net result of these two tendencies (when prices are falling) is a decline in the gross profit per unit of goods sold.

1929 to 1931, interest charges fell less than ten per cent, and domestic taxes actually rose to a slight degree.

The physical volume of production and trade declined about 18 per cent from 1929 to 1930, and 32 per cent from 1929 to 1931.[11] If we assume 1929 operations to have been at 'normal' capacity, this index of the physical volume of business suggests corresponding percentages of unused capacity of about 18 and 32 in 1930 and 1931, and corresponding percentages of interest and tax payments made on this idle capacity. Of course a considerable fraction of interest payments arises from short-term loans. But the constant element in these charges is due to liabilities, in the form of mortgages, bonds and notes, incurred in connection with property that was idle in 1930 and 1931. It would be possible to employ an accounting system in which charges for idle property were not levied against goods currently produced and sold, and services currently rendered. Such an accounting system would, of course, differ appreciably from that exemplified in current reports and in Table 6. Accepted procedure, in effect, involves including in the costs of goods currently produced a charge arising from capacity needed only in the period of peak demand, such as in 1929. The sums thus included represent charges against earnings in any case, of course, whether spread over a long period or charged to one or two years. However, the separate consideration of the elements that are involved in current calculations of profits is useful.

In the case of depreciation both types of difficulty are found. For in estimating depreciation charges, changes in the replacement costs of depreciating assets must be considered, as well as idle capacity. The degree of change in replacement costs is suggested by an index representative of changes in the prices of capital equipment. Such an index, computed by the National Bureau of Economic Research, was (on 1929 as a base) 93 for 1930, and for 1931, 86. The total of depreciation charges, which increased during the two years of depression covered by the data in Table 6, includes charges representing unused capacity and the neglect of price changes, as well as the customary deductions chargeable to operations under any system of accounting. The fact that aggregate depreciation and obsolescence charges for the entire period might possibly have been too low from a long-time viewpoint does not affect the significance of the cyclical distinction made here.

Losses on sale of capital assets (after deducting corresponding profits) are not, of course, considered a proper charge to current operations. To the extent that these losses arise from inadequate provision for depreciation and obsolescence, they represent costs incurred in earlier periods. If they are due to declines in replacement costs, they are results of price movements which may be distinguished from losses on operations.[12]

'Other deductions' undoubtedly include several items that could be analyzed in a similar manner. But lack of information precludes such a treatment. Bad debts and depletion, as computed, usually are properly treated as current charges. The rise in the former and the decline in the latter from 1929 to 1931 are noteworthy.

It would be possible, thus, to transform the income account appearing in Table 6 by separating deductions chargeable to operations, deductions chargeable to unused capacity, and deductions arising from price changes. Such a modified income account would prove illuminating; it would make clearer the nature of profits as estimated for income tax and other purposes. But any well-substantiated revision and discussion of the aggregate income account would involve a separate project of research, and an amount of space not here available.

Enough has been said, however, to throw some light on the meaning of the last row of figures in Table 6. Not only the absolute magnitudes but even the signs of the net incomes of business concerns derived from current operations may be affected by the methods of computation. This fact is of interest because of its bearing on the description of past business operations and on our estimates of economic welfare. (One of these important estimates is that of the national income.) This matter is of interest, too, because of the degree to which the present and future activities of business men are influenced by their accounting records. The everyday buying, producing and selling operations of business men in a period of depression are affected not only by such factors as the fear of spoiling the market or the supposed inelasticity of demand for their products, but also by the manner in which costs are computed. A change in this technique may have a profound effect upon the behavior of business men. Eventually, of course, if a condition of excess capacity persists and prices remain at low levels, the writing-down of assets will be effected through bankruptcy or some other mode of reorganization. In effect, then, there is ultimate recognition of the need for taking account of unused capacity and changes in price levels, in the computation of costs. But it may be possible to achieve the same results, and more promptly, through an open and deliberate recogni-

[11] Persons and Foster, *Review of Economic Statistics*, August 15, 1933, p. 155.

[12] Losses on securities suffered by regular dealers in stocks and bonds are due, of course, to operations, and form an exception in the above discussion.

Table 7

TOTAL ANNUAL CORPORATE SAVINGS IN THE UNITED STATES, 1919-1932

(Excluding tax-exempt corporations and life insurance companies)

(*In millions of dollars*)

Year	*Aggregate net income before payment of dividends but after payment of income taxes*[1]	*Net cash dividends paid*[2]	*Corporate savings (undistributed net income)*[3]
1919	6,910	2,600	4,310
1920	4,280	2,900	1,380
1921	—70	2,600	—2,670
1922	4,300	2,640	1,660
1923	5,720	3,310	2,410
1924	4,870	3,430	1,440
1925	6,830	4,020	2,810
1926	6,630	4,450	2,180
1927	5,730	4,780	950
1928	7,500	5,170	2,330
1929	7,950	5,780	2,170
1930	1,260	5,660	—4,400
1931	—3,240	4,200	—7,440
1932[*]	—4,930	2,500	—7,430

[*] Preliminary estimates.

[1] See Table 1.

[2] Data for 1919-21 are estimated by Ebersole, *et al.*, *(Review of Economic Statistics,* November 1929, p. 185). The 1932 figure has been estimated from data collected by the Standard Statistics Company.

[3] Column (2) minus column (3).

tion of the facts. This recognition may be facilitated by a keener awareness of the nature of accounting estimates.[23]

DIVIDEND POLICY AND CORPORATE SAVINGS

In spite of the drastic fall in profits, dividends continued to be paid at a high rate, at least until 1932. (This, of course, was due in part to the natural lag in the disbursement of profits to stockholders.) As a result, the annual savings of corporations, the profits left in the business after the payment of dividends, were sharply reduced in amount and finally became negative. The accumulations during the fat years preceding the decline in prices and production in 1929 were drawn upon during the lean period of the depression. The figures in Table 7 reveal the extent of corporate savings and their fluctuations during the last decade.[24]

[23] The figures here analyzed are those reported to the Treasury Department for income tax purposes. They are not necessarily those used in computations of costs. Undoubtedly the necessity of considering idle capacity and price changes in computing costs has gradually become recognized, especially in 1932. See, for example, an address by J. M. B. Hoxsey, Writing Down Assets and Writing Off Losses, delivered in February 1933 before the Massachusetts Society of Certified Public Accountants.

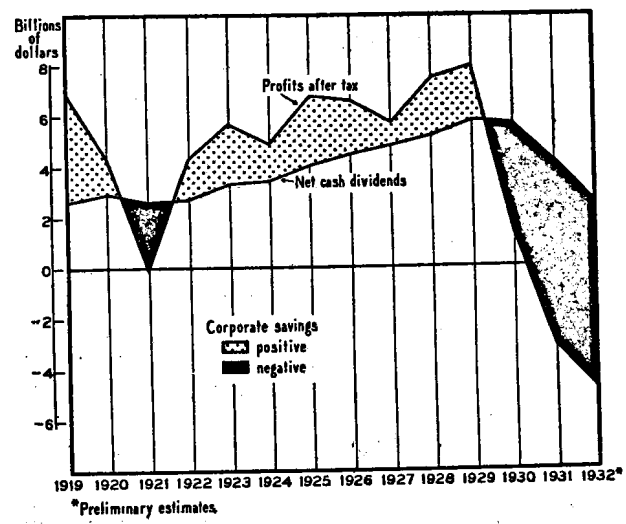
Much has been done by accountants in furthering this recognition. See, for instance, various publications of the National Association of Cost Accountants and its local chapters.

The relative steadiness of dividend payments is striking. The decline in profits in 1920 and 1921 was hardly felt, while the depressions of 1924 and 1927 made but slight visible impressions on these disbursements to stockholders. Only in 1931 and 1932 did the fall in dividends become great.

During the post-War period a substantial portion of earnings (after taxes) was retained in the form of corporate savings. For the eight years, 1922-29, these savings amounted to 32 per cent of net income after the deduction of income taxes. But the crash changed the situation completely, and by the end of 1932 the accumulations of more than a decade had been drawn upon to sustain at least partially the income of stockholders. During only three years, 1930, 1931 and 1932, the profits saved in the preceding ten years were disbursed.[25] Fortunate indeed were those with such a reserve upon which to draw.[26]

Figure 3

ANNUAL CORPORATE SAVINGS IN THE UNITED STATES



SUMMARY

The course of corporate profits in recent years was, obviously, unfavorable. But closer inspection reveals it as but a part of the entire cycle of prosperity and depression. The losses of 1931 and 1932 cannot be considered separately from the profits of 1928 and 1929 (and, if they exist, those of 1933). Costs incurred in years of prosperity were charged to years of depression, accentuating the trough. The whole picture, while not of a rosy hue, is not quite as dark as a casual inspection of accounting

[24] These figures differ from those published in *Bulletin 49* of this series, National Income, 1929-1932, because the savings shown here are of corporations only. Moreover, the net income in Table 7 does not exclude gains or losses on the sale of capital assets.

records would indicate. The more moderate fall in dividend payments reflects the impact of the depression upon stockholders and business concerns more correctly than does the movement of profits alone. Corporate savings formed the buffer which absorbed the cyclical bias in the calculation of profits.

But the effects of the psychological stimulus exerted by these estimates of profits, both in 1929 and in 1932, were not absorbed by any buffer. There is need, therefore, for a more adequate awareness of the nature of accounting estimates. The emphasis which thoughtful accountants are placing today upon a careful interpretation of accounts is well deserved.

[15] It is apparent that large parts of the dividends and interest paid in those three years were paid out of capital or out of corporate savings of prior years. It does not seem correct to describe such payments as 'income paid out', and the use of this term may have given rise to misconceptions. The paragraph at the foot of page 5 of *Bulletin 49* ending with the statement: "It is obvious that payments to property holders formed a relatively increasing cost to the economic system as a whole," does not seem to me to state the case quite accurately. What the property owners collectively received was largely, if not mainly, the result of their previous thrift—not a part of the current income flow for the depression years.

A conclusion substantially different from that presented in *Bulletin 49* is reached if the amount of income received by labor is compared with the total income produced for the years 1929-32. The figures taken from Tables 1 and 2 in *Bulletin 49* are as follows:

	1929	*1930*	*1931*	*1932*
Total income produced	83,037	70,484	54,652	38,349
Received by labor	52,867	48,688	41,027	31,595
Per cent of amount received by labor to total income produced	63.7	69.1	75.1	82.4

(Footnote by George O. May, Director of the National Bureau of Economic Research.)

[16] These figures refer to the aggregate of all corporations. If the large corporations in which dividends constitute the chief means of distributing earnings were considered separately the reduction of surplus would not be so marked.

Solomon Fabricant is associated with Frederick C. Mills in the National Bureau's studies of production and prices. He has also collaborated in other studies at the National Bureau in the field of corporate profits.

The subject of profits is of exceptional interest at the present time. Readers of this BULLETIN *will be glad to learn that the National Bureau expects to publish two volumes on the subject this year: a study of industrial profits by Ralph C. Epstein, who is now in Washington assisting in the work of the Committee on Government Statistics, and one by W. L. Paton, of the University of Michigan. The two studies differ in that Dr. Epstein's is based on a large sample secured through the cooperation of the Department of Commerce, and Dr. Paton's on a small sample, one drawn from auditor's reports.*

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

OSWALD W. KNAUTH, *Chairman* — GEORGE SOULE, *Vice-President*
JOSEPH H. WILLITS, *President* — SHEPARD MORGAN, *Treasurer*
CHARLES A. BLISS, *Executive Secretary*

Research Staff

WESLEY C. MITCHELL, *Director*
ARTHUR F. BURNS — F. R. MACAULAY
SIMON KUZNETS — FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, *Associate*

Directors at large

OSWALD W. KNAUTH — ELWOOD MEAD
H. W. LAIDLER — SHEPARD MORGAN
L. C. MARSHALL — GEORGE SOULE
GEORGE O. MAY — N. I. STONE

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

HUGH FRAYNE, *American Federation of Labor*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
ARCH W. SHAW, *National Publishers Association*
ROBERT B. WOLF, *American Engineering Council*

THE BULLETIN

The issue of our first *Bulletin* on profits, referred to in Mr. Fabricant's article, was exhausted almost immediately after publication. A few copies of *Bulletin 48,* Aspects of Recent Price Movements, and of *Number 49,* National Income, 1929-1932, are still available.

The next *Bulletin,* to be published in May, will feature an article on recent changes in the volume of production. To ensure receipt of copies of this and subsequent *Bulletins* your subscription ($1 for five issues) should be sent to the National Bureau at once. Please note the change of address to 1819 Broadway.

NEW PUBLICATIONS

The Annual Report of the Director of Research, Wesley C. Mitchell, was published immediately after its acceptance at the annual meeting of the Board of Directors of the National Bureau. Copies are available upon request.

Contributing members of the National Bureau have already received their copies of *German Business Cycles, 1924-1933,* by Carl T. Schmidt. The volume is now available to the public and copies may be obtained by writ-

ing to the National Bureau, 1819 Broadway (283 pp., 8 charts, 20 tables, $2.50).

For presentation to its contributing members, the National Bureau has purchased copies of the Senate report from which the estimates published in the last *Bulletin*, National Income, 1929-1932, were taken. Dr. Simon Kuznets, of the National Bureau staff, was in charge of this study of national income which was carried on by the Department of Commerce in cooperation with the National Bureau of Economic Research. The books will be bound and sent to contributing members within a fortnight.

German Business Cycles, 1924-1933

CARL T. SCHMIDT

Research Associate, National Bureau of Economic Research, 1931-1932

TABLE OF CONTENTS

I The Treaty of Versailles, Inflation and Stabilization
- The World War and the Treaty of Versailles
- The Currency Inflation
- The Year 1923: Ruhr Invasion and Currency Stabilization

II Review of Economic Conditions, 1924-1933
- The Course of the Post-Inflation Business Cycles
  - Depression, Halting Revival, Definite Recovery, 1924-1925
  - Recession and Depression, 1925-1926
  - Recovery and Prosperity, 1926-1928
  - Recession and Depression, 1928-1932
  - Hesitant Revival, 1932-1933
- Significant Aspects of German Economy, 1924-1933
  - Capital and Credit
  - Industrial Production
  - Agricultural Production
  - The Price System
  - Employment
  - Foreign Trade and the Balance of International Payments

III Statistical Analysis of Cyclical Fluctuations in Selected Time Series, 1924-1933
- The Technique of Measuring Cyclical Behavior
- Comparison of Cyclical Fluctuations in German Economy During Pre-War and Post-Inflation Periods
- Cyclical Behavior of Significant Groups in German Economy, 1924-1933
- International Relationships of German Business Cycles

IV Conclusions

283 pages, 8 charts, 20 tables **$2.50**

PUBLICATIONS, 1921-1934

*1. INCOME IN THE UNITED STATES
By Wesley C. Mitchell, Willford I. King, Frederick R. Macaulay and Oswald W. Knauth
Vol. I (1921), *Summary* 152 pp.

*2. Vol. II (1922), *Details* 440 pp.

3. DISTRIBUTION OF INCOME BY STATES IN 1919 (1922)
By Oswald W. Knauth 30 pp., $1.30

4. BUSINESS CYCLES AND UNEMPLOYMENT (1923)
By the National Bureau Staff and 16 Collaborators 405 pp., $4.10

*5. EMPLOYMENT, HOURS AND EARNINGS IN PROSPERITY AND DEPRESSION, UNITED STATES, 1920-22 (1923)
By Willford I. King 147 pp.

6. THE GROWTH OF AMERICAN TRADE UNIONS, 1880-1923 (1924)
By Leo Wolman 170 pp., $2.50

7. INCOME IN THE VARIOUS STATES: ITS SOURCES AND DISTRIBUTION, 1919, 1920 and 1921 (1925)
By Maurice Leven 306 pp., $3.50

8. BUSINESS ANNALS (1926)
By Willard L. Thorp, with an introductory chapter, Business Cycles as Revealed by Business Annals, by Wesley C. Mitchell 380 pp., $2.50

9. MIGRATION AND BUSINESS CYCLES (1926)
By Harry Jerome 256 pp., $2.50

10. BUSINESS CYCLES: THE PROBLEM AND ITS SETTING (1927)
By Wesley C. Mitchell 489 pp., $5.00

*11. THE BEHAVIOR OF PRICES (1927)
By Frederick C. Mills 598 pp.

12. TRENDS IN PHILANTHROPY (1928)
By Willford I. King 78 pp., $1.00

13. RECENT ECONOMIC CHANGES (1929)
By the National Bureau Staff and 15 Collaborators 2 vol., 950 pp., per set, $7.50

14. INTERNATIONAL MIGRATIONS
Vol. I (1929), *Statistics*, compiled by Imre Ferenczi of the International Labour Office and edited by Walter F. Willcox 1,112 pp., $7.00

18. Vol. II (1931), *Interpretations*, edited by Walter F. Willcox 715 pp., $5.00

*15. THE NATIONAL INCOME AND ITS PURCHASING POWER (1930)
By Willford I. King 394 pp.

16. CORPORATION CONTRIBUTIONS TO ORGANIZED COMMUNITY WELFARE SERVICES (1930)
By Pierce Williams and Frederick E. Croxton 347 pp., $2.00

17. PLANNING AND CONTROL OF PUBLIC WORKS (1930)
By Leo Wolman 260 pp., $2.50

19. THE SMOOTHING OF TIME SERIES (1931)
By Frederick R. Macaulay 172 pp., $2.00

20. THE PURCHASE OF MEDICAL CARE THROUGH FIXED PERIODIC PAYMENT (1932)
By Pierce Williams 308 pp., $3.00

21. ECONOMIC TENDENCIES IN THE UNITED STATES: ASPECTS OF PRE-WAR AND POST-WAR CHANGES (1932)
By Frederick C. Mills 639 pp., $5.00

22. SEASONAL VARIATIONS IN INDUSTRY AND TRADE (1933)
By Simon Kuznets 455 pp., $4.00

23. PRODUCTION TRENDS IN THE UNITED STATES SINCE 1870 (1934)
By Arthur F. Burns 363 pp., $3.50

24. STRATEGIC FACTORS IN BUSINESS CYCLES (1934)
By John Maurice Clark 238 pp., $1.50

25. GERMAN BUSINESS CYCLES, 1924-1933 (1934)
By Carl T. Schmidt 283 pp., $2.50

*Out of print

National Bureau
of Economic Research

BULLETIN 51

JUNE 28, 1934

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Recent Changes in Production

CHARLES A. BLISS

Copyright 1934, National Bureau of Economic Research, Inc.

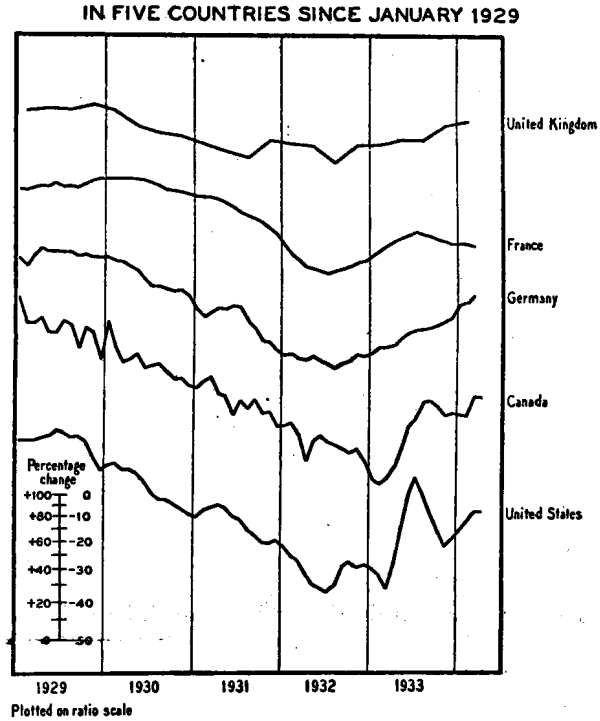
THE real income of a nation is the physical volume of economic goods which it annually produces. The present survey of recent production changes in the United States is concerned with this aggregate. The amount by which the flow of commodities has been curtailed during the depression; the increase during 1933; the new directions that the expenditure of our productive energies has taken; the effect of the depression on standards of living, on our productive equipment; the degree of decline in the productive efficiency of the economy; the change in the productivity of employed labor—these are all matters within the scope of the present inquiry.

WORLD RECOVERY

The recovery from depression lows of industrial output in the United States is one phase of a world movement that began in the summer of 1932. Suggestions of improvement appeared earlier, but in mid-1932 declines in production ceased in the more important industrial countries. The widespread character of the subsequent recovery, which came as a ground-swell of increased productive activity, is revealed in the comparison of index numbers for five countries in Figure 1.

In France and in Germany the trough occurring in mid-summer of 1932 is clearly marked, and while the use of quarterly statistics places the low point for the United Kingdom in the third quarter, supplementary information locates it, more exactly, in August. In the United States the 1932 recovery was short lived. Production rose for three months from a low in July, then leveled off and ultimately dropped to a second low in March 1933. In both the United States and Canada (which is the least industrialized of the countries here represented) the depression decline had started early; it also turned out to be more severe than in Europe.[1] But if decline was more precipitous in this country and recovery longer delayed, the increase in

Figure 1.
CHANGES IN THE VOLUME OF INDUSTRIAL PRODUCTION IN FIVE COUNTRIES SINCE JANUARY 1929



[1] Technical differences in the averages and variations in the character of the several economies affect all international comparisons of production changes. The index numbers here presented are described in the *Note* at the end of this article. Adequate measurements for all countries are not available, and there has been no attempt to make the present list all-inclusive. The use of quarterly averages for the United Kingdom tends to dampen the fluctuation of the given series, in comparison with monthly figures such as are available for the other countries represented.

the rate of production was more striking when it did come. However, the subsequent reaction in the latter part of 1933 was a movement shared only by France and Canada.

The accompanying table summarizes the movements of these index numbers during decline and recovery. The components of the index numbers (with the exception of the quarterly index for the United Kingdom) are corrected in most items for usual seasonal variations.

Country	Decline from peak activity to low point of index[1] (*per cent*)	Increase from low point to level at latest month[2] (*per cent*)	Percentage below peak activity at latest month
United Kingdom*	—22	+19	— 7
France	—36	+14	—27
Germany	—43	+42	—20
Canada	—59	+50	—38
United States	—53	+42	—33

*The measurements for the United Kingdom relate to quarterly rather than to monthly figures.

The recent increases in production in the United States and in Canada seem large at first glance, but the picture is somewhat different when viewed in the light of the preceding declines. In such a comparison, recovery seems most advanced in the United Kingdom where the rate of productive activity, as measured by the quarterly index, had declined but 22 per cent during the depression. Recovery in the United States has still about two-thirds of the previous loss to regain in order to attain the peak levels of 1929. On the other hand, the pre-recession advance was greater in this country. The average rate of growth of industrial production for the period 1922-29 was but 1.8 per cent per year in the United Kingdom, less than half of the 3.7 per cent rate of growth in the United States.

The extent of recovery is revealed when we compare present levels with those of the preceding highs as is done in the last column of the above table. The index of industrial output in the United Kingdom is within 7 per cent of the highest quarter of 1929; the index for the United States is still 33 per cent below its 1929 high. In Germany the current rate of production is 20 per cent below that of peak activity, in France it is 27 per cent below the pre-recession high. In all these countries an increased production is beginning to restore to former levels the flow of economic goods. But even these levels must be exceeded if allowance for additions to population since 1929 is to be made.

[1] For the United States and Canada the measurements relate to movements up to April 1934. For France and Germany the latest month for which figures are available is March; for the United Kingdom the latest figure is for the first quarter of 1934.

March 1933 is taken as the depression low for the United States although the level of July 1932 was one point lower in the index used (Federal Reserve Board). Other indexes of industrial production indicate the low to be March 1933.

The difference in bases makes a given percentage rise from the low point much less considerable, in absolute terms, than the preceding fall.

CHANGES IN THE TOTAL VOLUME OF PRODUCTION IN THE UNITED STATES

The current measurements pictured in Figure 1 reveal the remarkable spurt in production that occurred in the United States in the spring and summer of 1933, the subsequent decline and the recovery in the spring of 1934. But such measurements of monthly changes are restricted to industrial production, that is, to the products of manufacturing and mining. In measuring production as a whole, and in covering each field as completely as possible, the year must be the unit. Moreover, when the results of our productive efforts are assessed in terms of consumer benefits, annual totals are of greater significance than are rates of activity over short periods. It is in these broad changes in total production during recent years that our present interest lies.

Comprehensive measurements of the course of production in the United States from 1927 to 1933 are presented in Table I, together with figures showing the growth of population. The activities represented, agriculture, mining, manufacture and construction, are those which result in a physical product. The index numbers are relative to a 1927 base, so that some notion may be had of the changes prior to the 1929 break.

In the last column of Table I is a striking picture of the losses brought by the depression. It is a picture painted not in the changing colors of price and money, but in terms of constant units of physical quantities. It is a record of a real loss to the country, amounting, in the past year, to well over 25 per cent of the 1927 output and to roughly 35 per cent of the peak production of 1929. Such a decrease has seriously impaired the well-being of the country. Reductions in the wheat crop, in petroleum output, in iron and steel, in automobiles, and in building—these are all losses which are suffered, in the final analysis, by consumers in the aggregate. The loss is not entirely direct, of course, for there is always some portion of current production going to the replacement or increase of productive equipment. But direct or indirect, immediate or postponed, the reduction in output of economic goods since 1929 has left the real income of a more numerous population greatly below what it was in pre-recession years.

The recovery in total production during the last year was not inconsiderable. The average output of agriculture, mining, manufacturing and construction in 1933 was 4 per cent greater than in 1932. Yet this increase offset roughly less than 3 of the 36 per cent decline suffered since

Table I

CHANGES IN POPULATION AND IN THE PHYSICAL VOLUME OF PRODUCTION IN THE UNITED STATES, 1927-1933[1]
(1927: 100)

Year	Population	Agriculture	Mining	Manufacturing	Construction	Total Production
1927	100.0	100	100	100	100	100
1928	101.2	105	100	109	103	106
1929	102.2	103	109	116	97	110
1930	103.1	101	97	98	87	97
1931	103.9	106	82	83	74	86
1932	104.5	98	67	66	47	70
1933	105.2	94	72	74	34	73
Percentage change						
1929-32	+2.3	—5	—38	—43	—51	—36
1929-33	+3.0	—8	—34	—36	—65	—34

[1] These index numbers are described in the *Note* at the end of this article.

1929. Among raw materials, agricultural output was 8 per cent, and mineral production 34 per cent, below the level of 1929. Manufacturing production had increased 12 per cent from 1932 but still remained 36 per cent below the output of 1929; construction in 1933 dropped to still lower levels, some 65 per cent below 1929. The economic system was providing the consumer with the basic products of agriculture (chiefly foodstuffs) but the satisfaction of other wants and investment in equipment were being seriously restricted.

Although these group measurements suggest the character of the nation's loss, the precise relationships indicated do not reflect the varying fortunes of the different producing groups. Changes in the prices at which goods are bought or sold as well as in the quantities produced affect the aggregate purchasing power of every group. Differences in the degree of control over supply and variations in the cyclical stability of demand must be considered. Relative purchasing power depends also upon the changes in the income of every other element in the economic community. As a result, index numbers of the physical volume of production alone tell but part of the story of the changing well-being of particular groups of producers.[3]

When any one producing group maintains its output in the face of a disadvantageous exchange relationship, it continually offers more, in physical quantities, for those goods which it seeks to purchase. This, of course, was the position of the farmer during the greater portion of this period. The developments of the past year, which have brought diminished output from the farms and relatively higher prices of agricultural staples, have tended to correct this situation.[4]

[3] Variations in the aggregate purchasing power of the different income groups of the population were described in National Income, 1929-1932, *Bulletin No. 49* of this series.

The recent course of agricultural production is marked by diverse movements. The index numbers of farm production presented in Table I are the estimates of net agricultural production of the United States Department of Agriculture; they cover all products from which farmers derive income. The production of grains, which make up about 15 per cent of the total, declined slowly during the first part of the depression but fell sharply during 1933, owing to crop restriction and bad weather. Cotton farmers, on the other hand, had a most favorable 1933 season with unusually high yields. In spite of a smaller acreage there was little or no reduction in output. Production of dairy and poultry products, of vegetables and fruits and nuts remained high. Governmental action led to an increased slaughter of meat animals in 1933. The net result of these various changes is summarized in the average given in Table I.

The high level at which agricultural production was maintained during this period does not indicate any superior position on the part of the farmer. Rather, the large output helped to depress the prices for which the products were sold. The recently-compiled estimates of national income reveal that agricultural income fell proportionately more than did total national income between 1929 and 1932, and was distributed to a group of workers scarcely diminished in size. The decline in per capita income was considerably more than that for any other industrial group represented in Table I. On the other hand, the burden of many of those counted as detached from other industries

[4] A similar situation develops when there are changes in the relationships among the monetary units of the nations entering into world trade. The action of the United States in leaving the gold standard and the resulting cheapening of the dollar in world markets made it necessary to increase the physical amount of exports required for the purchase of a fixed quantity of foreign goods.

in the computation of per capita income was assumed by relatives and others more fortunate in retaining employment.[5]

In contrast to the active part it played in the recovery of 1921-22, the construction industry contributed but little to the general improvement in 1933. In spite of the inclusion in the averages presented in Table I of expenditures on public works, total construction declined.[6] This is true even when the dollar totals, which are the only complete measures of construction volume, are corrected for changing prices, as has been done here.[7]

In mining and manufacturing the changes in physical output have been quite similar. In both, the peak of activity occurred in 1929 (a year later than the date of the maximum output in agriculture and in construction) and, in the declines that followed, each dropped steadily and by about the same amount. Recovery in 1933 left them still at approximately the same levels, about 35 per cent below those of 1929.[8]

Recent changes in production in the United States are thus characterized by a wide variety of movements. Agricultural output fell but slightly, construction volume fell by two-thirds, and industrial production (manufacture and minerals) fell by more than a third. These are wide differences in the incidence of the depression on the activity of different producing groups. Taken together, and considered in relation to a steadily increasing population, these measurements tell the story of a sharp drop in the real income of the nation.

[5] The increase of more than two million in farm population between 1929 and 1933 indicates that a portion of this burden was carried by farmers. But the number is small compared with the total of the industrial unemployed and their dependents.

[6] The estimates of public works included in the compilations underlying these index numbers would be much larger if we were to include expenditures the first purpose of which was relief rather than public improvement.

[7] See the *Note* at the end of this article for a description of these measurements. The index here given is substantially confirmed by estimates of the volume of shipments of thirty construction materials compiled by the Federal Employment Stabilization Board. Recomputed on 1927 as base these index numbers are as follows:

1927 — 100	*1930* — 77
1928 — 102	*1931* — 61
1929 — 94	*1932* — 41

On a monthly basis available data for construction contracts indicate a low point in the spring of 1933. The average for the year, however, is below that of 1932.

[8] It is perhaps surprising that the production of basic mineral products should have declined no more than did the volume of manufacture. The reason lies in the presence in the mineral group of certain products subject to a rather stable consumption demand, chiefly crude petroleum and natural gas. The movements of these and other individual series are summarized in Table V.

CHANGES IN THE PHYSICAL VOLUME OF FOREIGN TRADE

Two factors qualify the use of changes in physical output as a measure of a country's well-being. One is foreign trade; the other is inventories. The amount of current production going to consumers is reduced by a physical volume of exports greater than that of imports or by general addition to inventories. Likewise, a reduction in stocks or relatively heavier imports increases this flow. The index numbers of changes in the physical volume of our foreign commerce given in Table II are therefore pertinent to the present inquiry.

Table II

CHANGES IN THE PHYSICAL VOLUME OF FOREIGN TRADE OF THE UNITED STATES, 1927-1933

(1927: 100)

Year	*Exports*	*Imports*
1927	100	100
1928	103	102
1929	106	116
1930	88	98
1931	72	87
1932	56	70
1933	56	76
Percentage change		
1929-32	—47	—40
1929-33	—47	—34

Between 1929 and 1932 the physical volume of exports dropped 47 per cent. For the same period the drop in the output of domestic production (excluding construction) was considerably less: 36 per cent. This difference means that the foreign market absorbed less and less of domestic output, the proportion of domestic production shipped out of the country having declined from about 10 per cent in the period before 1929 to about 7 per cent in 1932.[9]

In 1933 there was a further decline, for although domestic production increased, there was no rise in the volume of exports. Because of the different magnitudes involved, this relation of the volume of foreign trade to the total volume of domestic production must be kept in mind when comparing the index numbers of exports and imports with the averages of total production in Table I.

During the period since 1929, the flow of physical commodities favored the United States. Since the average unit-value of imports declined more than the unit-value of exports, there was a tendency for a relatively greater volume of goods to be imported than exported.[10] Whereas in 1929 a physical unit of exports would have bought only one unit

[9] Estimated by the United States Department of Commerce.

[10] This was partly due to a greater decline in the prices of raw materials than of manufactured goods, since the former have bulked larger in our imports than in our exports. But most important was the rising value of the dollar in terms of other national currencies prior to 1933.

of imports, in 1932 one and one-fifth units of imports were purchased. In terms of potential consumer satisfactions, this shift was highly desirable. Yet the advantage was unreal for those consumers who were at the same time producers deprived of foreign markets or harassed by a greater foreign competition at home. The departure of the United States from the gold standard in 1933 and subsequent events have tended to reverse the situation. As yet, however, the full effects of the change in monetary policy have not been felt. Partly because of general uncertainty and partly because of a possibility of devaluation, foreign purchases of American goods in 1933 were delayed until late in the year. But if present exchange relationships continue, we should expect a more rapidly increasing physical volume of exports than of imports.[11]

CHANGES IN THE VOLUME OF INVENTORIES

Much of the sharp increase in production that marked the second and third quarters of 1933 was in anticipation both of expected monetary inflation and of higher production costs under the proposed industrial codes. The immediate result was probably an increase in the physical amount of goods held in stock. Yet it is difficult to measure the extent of these inventories and to determine their location in the hands of the various producing agents—manufacturers, wholesalers, retailers. Utilizing such quantity statistics as are available (chiefly relating to raw and semi-finished goods) the Department of Commerce currently compiles a series of measurements of stocks of selected commodities held in various industries. Separate totals are given for raw and manufactured products. The index numbers of stocks at the end of each year since 1927 are shown below.

	Raw materials	*Manufactured goods*
December 1927	100	100
1928	104	108
1929	124	105
1930	130	106
1931	139	96
1932	129	85
1933	142	96
Percentage increase, December 1932 to December 1933	+10	+13

These measurements indicate that the stocks of manufactured goods in recent years were never large in relation to the holdings at the end of 1927. However, stocks of raw materials (chiefly agricultural staples) rose with the drop in demand, though they were reduced in 1932. The 1933 increase in stocks was greater for manufactured goods although the significance of the figures is limited by the paucity of available information on stocks at this stage in production. The index of stocks of raw materials rose 10 per cent between December 1932 and December 1933, stocks of manufactured and semi-processed goods rose by 13 per cent.[12]

A study of the balance sheets of over 150 industrial companies gives us additional evidence on changes in stocks of goods during 1933. For these corporations the reported inventories aggregated 2,441 millions of dollars on December 31, 1932. A year later inventories for these same corporations totaled 2,830 millions, an increase of 16 per cent.[13]

In view of an increased rate of business activity over that of the previous year, these figures do not indicate any excessive increase of stocks in the hands of producers. Increased turnover of itself demands an increased inventory. Moreover, these inventory figures are in dollars and therefore reflect the pleasantly buoyant effect of a rise in prices. If we correct for changes in the level of wholesale prices during 1933, this 16 per cent increase in dollar inventory is reduced to 4 per cent.[14] To the extent that the goods

[11] Adjustment of tariff barriers would, of course, have its effect on these relationships. So also would a resumption of international capital movements, since these and other 'invisible' items of foreign exchange also enter into the balance of international payments.

[12] These index numbers are currently published in the *Survey of Current Business*. Items are weighted by the value of total production in the base years 1923-25, lumber being the most heavily weighted commodity in the manufacturing group. The index numbers have been shifted to a December 1927 base for the purpose of this *Bulletin*.

Normal seasonal variation prevents a direct comparison of stock holdings between December and the mid-year. But a rough adjustment may be made in the Department of Commerce figures for this seasonal factor. The following figures are for manufacturing only.

	1932 December	*1933 March*	*1933 June*	*1933 September*	*1933 December*
Seasonally adjusted (December, 1927: 100)	88	86	90	104	99

[13] The companies selected were those for which published balance sheets are available; consequently the sample is dominated by large concerns.

To avoid excessive weighting of particular industrial groups, efforts were made to approximate the distribution of inventories of all manufacturing corporations as reported in *Statistics of Income for 1931*. The present sample represents approximately 30 per cent of total inventories of manufacturing corporations. Companies specializing in wholesale or retail trade have not been included.

The change in inventories for the various industrial groups ranged from —8 per cent (paper) to +68 per cent (textiles and textile products). A compilation of the Standard Statistics Company from reports of 400 companies shows a 13.3 per cent increase in the value of inventories during the year.

[14] Wholesale prices of manufactured goods (as measured by the index numbers of the National Bureau of Economic Research) rose 11 per cent between the level of December 1932 and the average for the last six months of 1933.

Table III

ESTIMATES OF CHANGES IN LABOR PRODUCTIVITY
MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1929-1933[1]

(1) Year	(2) Index of physical output of manufactures	(3) Factory employment	(4) Output per wage earner employed (2) ÷ (3)	(5) Index of hours per week actually worked	(6) Man-hours (3) × (4)	(7) Output per man-hour (2) ÷ (6)
1929	100	100	100	100	100	100
1930	85	87	97	93	81	104
1931	72	74	97	87	64	112
1932	57	61	93	77	47	121
1933	64	66	97	76	50	127

[1] See the *Note* at end of this article for a description of these index numbers.

held in inventory at the end of 1933 had been produced prior to the price rise this may be an over-correction. But the margin of error cannot be large, and the conclusion remains that inventories in the hands of manufacturers were little, if any, larger at the end of 1933 than they were at the beginning.[15]

CHANGES IN PRODUCTIVE EFFICIENCY, 1929-1933

That the efficiency of the economic system has declined since 1929 is evidenced by the curtailed volume of employment and the reduced output of goods. In terms of 1929 output, 1933 operations were but 65 per cent of normal. There can be no talk of general productive efficiency with men idle and factories half empty. Yet in a special sense increases in efficiency may occur in the output which continues to be produced. While efficiency may be considered relatively to any of the various factors of production, it is efficiency in the use of labor effort which is here in mind. Changes in such efficiency are measured by the ratio of changes in output to changes in number of workers or man-hours.

A period of depression is conducive to improvement in labor productivity. Faced with narrowing profit margins, business men strive for cheaper, more direct, more efficient methods of production. With overhead costs per unit increasing, special effort is made to reduce direct costs per unit, largely by laying off the less efficient workers and by improving management. When aggregate man-hours are reduced by more than the decline in output, there is evidence that the productivity of the employed labor has increased. In some respects the gains are potential, for the necessity of curtailing production schedules prevents the full enjoyment of the improvement. On the other hand, this reduction in output is itself a source of increased efficiency, for it makes possible the concentration of the more skilled workmen on the better machines and leads to the shutting down of the least efficient plants.

The record of economic progress has been characterized by repeated increases in labor productivity. Particularly was this so during the post-War decade. Since there was no great alteration, prior to 1929, in the length of the work-week, changes in output per worker are acceptable measures of this pre-recession advance. Such measurements indicate an increase of some 22 per cent in the output per employed factory worker between 1923 and 1929. During the full decade, 1919-29, the increase in productivity was over 40 per cent.[16]

An attempt to estimate the extent of the increase in the productivity of employed factory labor since 1929 is made in the successive columns of Table III. Unlike the pre-recession advance in productivity, which coincided with increases in total output, the recent gain is the net resultant of factors shrinking at varying rates. Employment in manufacturing industries has dropped 34 per cent since 1929. A work-week averaging just short of 50 hours in 1929 has been reduced to about 38 hours in 1932 and 1933[17]—a drop of almost 25 per cent. Total man-hours have thus

[15] Little information is available on stocks in the hands of wholesalers and retailers. The compilations of the Federal Reserve Board for department stores indicate an 8 per cent increase in stocks between December 31, 1932 and December 31, 1933; a 14 per cent increase from June 30, 1933, after adjustment had been made for normal seasonal movements. Sales in December 1933 were 15 per cent larger than in the preceding year; but were approximately the same, after correction for the seasonal factor, as in the previous June.

Stocks held by wholesale grocery firms reporting to the New York Federal Reserve Bank increased 57 per cent during 1933 (net sales for the one month of December were 43 per cent greater than December 1932). Wholesale hardware stocks were reported 12 per cent higher.

Since these various measurements relate to dollar inventories, they reflect the effect of higher prices.

[16] Cf. *Economic Tendencies in the United States*, by F. C. Mills (National Bureau of Economic Research, 1932), pp. 289-99.

These increases in productivity, as well as those for recent years described in the present survey, relate to manufacturing only. Similar gains were not experienced in all fields of employment.

[17] The average of hours per week for 1933 is but fractionally below that of 1932 because in many industries the depressed rate of activity has kept the weekly hours well below the maximum imposed by the N.R.A. codes.

declined 50 per cent since 1929. Physical output has declined 36 per cent. Taken together, these estimates indicate an increase in output per man-hour of approximately 25 per cent in four years, an amazing advance indeed.

Striking as is this change in productivity, we must realize that it is not directly comparable with the increases recorded for the post-War years. As has been suggested, the recent improvement may be in large part the result of temporary organizational changes, of greater labor effort on the part of the more skilled workers remaining in employment, and the use of the best of the existing equipment—all changes contingent in large degree upon a reduced rate of production. These are factors probably far more important than the introduction of revolutionary mechanical innovations. To the extent that this explanation is true, it indicates that in the heyday of 1929 our productive system was inefficiently organized, that much labor effort was wasted or that much of our productive equipment was of second order. The interruption to the improvement in output per man-hour caused by the effort to increase production in 1929 accords with this suggestion (there was an 8 per cent advance in 1928, none in 1929). So does the notable inactivity in the capital goods industries during the depression. Little of the increased productivity since 1929 can be credited to the introduction of new machinery. Such improvements still lie before us.[18]

Although much of the increase in productivity during the depression would appear to be dependent on a rate of productive activity considerably less than that of 1929, it is by no means correct to assume that the improvement will entirely disappear with the resumption of more normal production schedules. The depression years have taught many lessons not likely to be soon forgotten, and have forced plant reorganizations that will result in permanent gain. The general adoption of a shorter work-week will bring, of itself, a sustained improvement in efficiency. In addition, a considerable amount of new machinery will probably be installed in order to avoid placing workmen receiving higher hourly wages at long-idle and probably obsolete machinery. Consequently there is strong likelihood that much of the recent gain in labor productivity will be retained.

[18] Little information is available on the physical output of machinery industries. Employment in foundry and machine shops is estimated to have declined 55 per cent from 1929 to 1932; in the machine tool industry, employment dropped over 75 per cent, orders by 88 per cent.

The wide margin between the poorest and the best of existing equipment is indicated by the replies to the series of questions addressed to prominent engineers and business executives by a special sub-committee of the Columbia University Commission on Economic Reconstruction. As recorded in the report of this investigation (*Economic Reconstruction*, Columbia University Press, 1934, p. 91) replies indicated a possible improvement of about 75 per cent in physical output if existing equipment and management were brought up to the level of the most efficient.

An increase of more than 25 per cent in the physical product resulting from a given amount of labor effort is a remarkable advance for such a short period. But in terms of national well-being, full enjoyment of this increased productivity will not be had until the rate of manufacturing operations is again on a level commensurate with normal needs. If, under such circumstances, the ratio of output to labor hours remains high, the gain will be positive and the benefits real. The shorter working week under the codes may in part be continued, and the desired increase in the volume of output brought about at the same time; the new leisure and the increased output should both contribute to an improved standard of living. Yet with the constantly changing direction of productive activity the task of adjustment for an enlarged working population is not easy. Increases in labor productivity do not simplify the problem.[19]

THE CHANGING DIRECTION OF PRODUCTIVE ACTIVITY IN DEPRESSION AND RECOVERY

One of the striking features of the period of pre-recession expansion was the increasingly larger portion of our productive efforts being devoted to the output of durable goods, particularly those for use in further production. Doubtless a similar emphasis upon such goods characterizes most periods of industrial growth but the extent to which this was true in the post-War decade was remarkable. Consumers were turning to the more durable of consumption goods and producers were taking advantage of circumstances favorable to the increase of equipment.[20] With the break in 1929 this tendency was reversed, and as the depression continued the output of such goods decreased even more sharply. The extent of these declines is indicated by the index numbers given in Table IV, and is shown graphically in Figure 2.

It is evident that the full force of the depression has exerted itself on those products for which demand may be postponed. The output of foods, the most imperatively needed of all consumption goods, declined least; they likewise gained least in 1933. Similar in behavior was the output of perishable goods, of which about seventy per cent are foods. Durable goods, on the other hand, bore the full

[19] The figures in Table III provoke speculation on the capacity of industry to reabsorb those workers displaced since 1929. Assuming that the volume of output be returned to the level of 1929, that output per man-hour remain at the present selective rate, and that hours per week rise to the maximum permitted under the codes (an average but slightly below 40 hours per week, 18 per cent below 1929) we have an estimate of employment increased to 97 per cent of the 1929 total. Because of population growth the volume of employment should be larger than in 1929, though a physical output greater than the 1929 average used in the above calculation is also necessary if we are to return to the former per capita rate.

[20] See *Economic Tendencies in the United States* for a description of the period.

Table IV

CHANGES IN THE PHYSICAL VOLUME OF MANUFACTURING PRODUCTION ANALYZED ACCORDING TO THREE CLASSIFICATIONS OF COMMODITIES

(1927: 100)

	1927	1928	1929	1930	1931	1932*	1933*	Percentage Change[1] 1929-32	1929-33
All Industries	100	109	116	98	83	66	74	—43	—36
Foods	100	104	110	108	101	95	96	—13	—12
Non-foods	100	110	117	96	79	59	69	—49	—41
Perishable commodities	100	105	112	109	101	94	97	—16	—13
Semi-durable goods	100	102	107	91	90	80	91	—25	—15
Durable goods	100	115	122	96	67	38	48	—69	—61
Goods for human consumption	100	107	114	101	92	79	86	—31	—24
Goods for use in capital equipment	100	117	126	98	69	42	52	—66	—59
Construction materials	100	106	107	82	60	36	43	—66	—60

*Preliminary.
[1] Shown graphically in Figure 2.

brunt of the depression. In 1932 the output of all durable goods was only one-third that of 1929. Curiously, the production of goods for use in capital equipment and the output of construction materials were reduced by the same amount, although the latter did not rise to as great a peak as the former in 1929. The percentage increases in 1933 over 1932 in these durable goods industries were considerable, but being percentages they reflect in part the extremely low levels to which output had fallen the preceding year. Production in 1933 was still about 60 per cent below 1929 levels.

Since all production is for the ultimate purpose of human consumption, the measurements discussed above may be interpreted in the light of general consumer interest. The output of consumption goods is directly to the benefit of all consumers collectively, the output of goods for use as capital equipment only indirectly so. The sharpest drop, as we have seen, occurred in investment goods—in productive equipment and construction. Here the loss to the consuming public is indirect and the need postponable. Indeed, if during the period prior to 1929 the production of these types of goods had utilized a greater portion of our productive energies than was proper to the maintenance of economic balance, the extent of the loss is more apparent than real.

Consumers, in general, also suffered directly through the reduced output of consumption goods. Between 1929 and 1932 the production of such goods, both durable and non-durable, was reduced approximately 30 per cent. In view of an increase in population of about two and one-half per cent during the same interval, this means an average decrease in actual standards of living of roughly 33 per cent. Per capita of population, the flow of consumers' goods had been reduced by one-third.[a]

[a] Total national income paid out declined from 1929 to 1932 by roughly 40 per cent. The cost of living of industrial workers as measured by the Bureau of Labor Statistics fell 20 per cent. The indicated drop in real income of the nation, estimated in this fashion, is about 25 per cent.

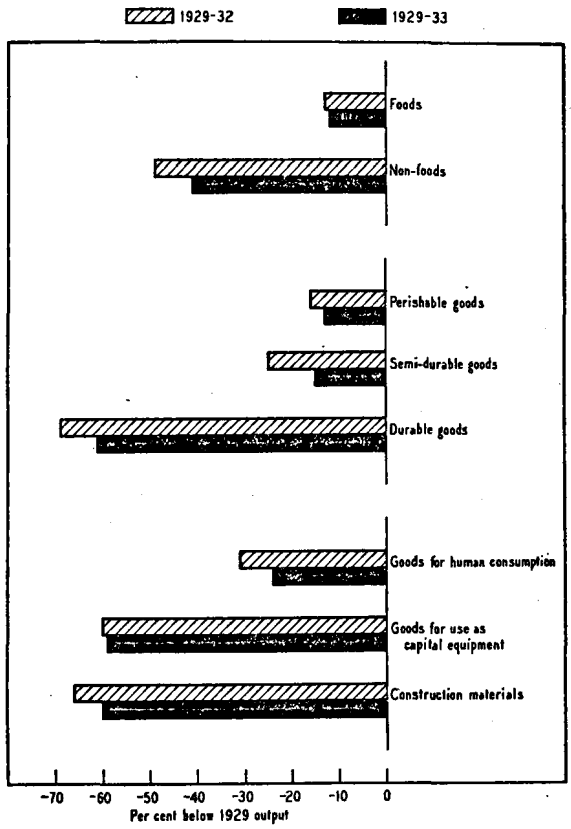
The index numbers presented in Table IV relate only to manufactured goods, and to these products in all stages of fabrication. Weights are based on value added by manufacture. Consequently, the present averages are measures of the volume of fabrication only; they do not relate to total production as do the index numbers in Table I.

Account should be taken of those products which go directly to the ultimate consumers with little or no fabrication. Among these are fresh fruits and vegetables, and certain dairy and poultry products, which, being foodstuffs, showed scarcely any decline in production during the depression. Coal and natural gas, and such building materials as sand and gravel which are processed directly at the quarry are also not included in the measurements of manufacturing output.

As a result of variations in the impact of the depression upon different types of goods, the direction in which the productive energies of the country are expended has been considerably altered in the past four years. A greatly-lessened share of our productive effort has been devoted to the production of investment goods. On the other hand the pressure of consumer demand has maintained, to a fair degree, those processes leading to the output of the necessities of life. The greatest recovery in 1933 for the groups given in Table IV was that of semi-durable goods, which is composed chiefly of textiles and textile products. During a period of reduced output one would expect a relatively greater emphasis on the production of consumption goods. Deliberate efforts to foster increased consumer purchasing power have had the same immediate result, though the secondary effect of such changes is ordinarily to create a demand for investment goods. The restrictive influence of relatively rigid prices for equipment goods and the existence of a limited capital market have kept activity in these industries low.

The present apportionment of total productive energies, distorted by the depression, will undoubtedly revert in due course to something closer to the pre-recession relationships. The extent of this reversion will, however, depend on many factors. Among these will be the extent to which consumer purchasing power is spent for present goods or for future

Figure 2
ILLUSTRATING THE EXTENT OF DECLINE IN MANUFACTURING OUTPUT SINCE 1929



incomes, as well as the extent to which investment funds are diminished by the drain of the depression years and higher tax levies. The flow of such funds may be restricted by new circumstances. On the other hand, relatively higher wages for industrial labor will encourage a demand for new capital equipment. There is also a probable reservoir of an as-yet-ineffective demand for durable goods accumulated during the years of reduced consumption.[22] Perhaps the greatest possible improvement in living standards would be through the provision of better housing, which would entail, both directly and indirectly, a larger production of durable goods. Whether or not the pre-depression share in total productive energies will again be devoted to the output of equipment goods is uncertain. But it is certain there will again be an increase in the production of durable goods in general, if the upward march in the standard of living is to be resumed.[23]

[22] The deficit in all consumption goods over the depression years must be considered in large measure to have been written off with the passage of time. There is no accumulated need for food which might have been eaten or for fuel which ordinarily would have been burned. Even in the case of semi-durable goods, the depression may have lasted longer than the ordinary life of these products, but for most durable goods this is not so likely to be true.

SUMMARY

The almost universal halt to world decline in productive activity that occurred in the summer of 1932 was experienced also in the United States. But here the subsequent recovery, as indicated by measures of the output of mining and manufacture, followed a distinctive pattern. Delayed by a collapse to a second low in early 1933, recovery came with a rush during the spring and summer months, was temporarily halted in the last quarter of the year and then resumed its advance in 1934. The present rate of industrial activity finds us, however, still one-third below the highest levels in 1929.

A broader view of production movements may be had through the average of annual changes in agriculture, mining, manufacturing and construction. A wide diversity of movement is involved, but the aggregate indicates a loss of 35 per cent in the output of the commodities that contribute to the nation's well-being. The net improvement during 1933 brought an increase of 4 per cent over 1932. Examination of statistics of foreign trade and of inventories shows that the flow of commodities was not diminished by a net diversion to stocks or to consumers in other countries, but rather was increased by such changes.

During the depression the increase in labor productivity that had characterized the pre-recession years continued. An hour of labor effort in 1933 yielded an output over 25 per cent greater than in 1929. While this increased productivity probably resulted in large part from the concentration of the best workers on the best equipment, there is reason to expect that much of the improvement will be retained when the labor force is again increased and a more normal rate of productive activity resumed. For part of the gain is due to improvements in organization that will be maintained, and further improvements may be expected when business enterprises are ready to buy new equipment again on a considerable scale.

Meanwhile, an increase in population of three per cent since 1929 requires that aggregate production surpass the level of that year if former standards are to be restored. Even greater efforts are necessary if the real income of the nation is to be materially advanced.

[23] The effect of a rise in income upon any standard of living is to decrease the relative expenditure on foods and other necessities. Applied to the national standard of living this would suggest the very tendencies observed in the pre-recession decade: an increased output of durable goods and an increased importance of the service industries. Such changes go hand in hand with the attainment of a higher standard of living.

It is unfortunate that the necessary accompaniment of this advance is an increased susceptibility to extreme fluctuations in demand as the area of essential needs diminishes in relative importance in the consumer budget.

APPENDIX

A. CHANGES IN THE OUTPUT OF INDIVIDUAL COMMODITIES

In all the general measurements presented in the foregoing discussion recourse has been had to averages of what are, in many instances, divergent movements. The following table presents data relating to changes in 80 production series during the three periods 1922-29, 1929-32 and 1932-33.

Table V

CHANGES IN 80 PRODUCTION SERIES, 1922-1929, 1929-1932 AND 1932-1933

(1) Commodity	(2) Average annual rate of change 1922-29[1] (per cent)	(3) Percentage change 1929-32	(4) Change, 1932-33, as percentage of 1929[2]
Agricultural products			
Barley	+11.7	+7.8	−52.1
Wool	+5.6	+7.7	−27.8
Cotton	+5.1	−12.3	+1.2
Cottonseed	+5.1	−12.3	+1.2
Truck crops	+4.8	−2.8	−2.1
Milk	+3.2	+2.5	+0.8
Sugar, domestic	+2.9	+29.7	+20.6
Rice	+2.8	−0.5	−11.8
Poultry products	+2.3	0	+1.7
Wheat	+1.3	−8.5	−26.7
Tobacco	+0.9	−33.4	+24.3
Meat animals	+0.4	−1.0	+4.8
Fruits and vegetables	+0.4	+3.9	0
Corn	−0.4	+14.7	−22.8
Hay	−0.6	−7.8	−5.7
Oats	−1.0	+11.5	−47.0
Potatoes	−1.2	+8.8	−12.4
Minerals			
Natural gas	+11.8	−18.9	+1.4
Crushed stone	+8.6	−49.7	+3.7
Copper	+7.3	−72.8	+7.2
Petroleum	+7.1	−22.0	+11.3
Zinc, slab	+5.4	−66.7	+18.4
Cement	+5.2	−55.3	−7.9
Lead	+4.5	−60.2	+3.5
Iron ore	+3.4	−86.5	+68.3
Gypsum	+2.7	−72.8	−2.3
Bituminous coal	+1.7	−42.2	+3.9
Anthracite coal	+0.9	−31.9	−1.1
Silver	−1.1	−60.9	−2.7
Gold	−1.8	+10.9	−0.6
Series relating to manufacture			
Aircraft[3]	+73.1	−77.5	−1.2
Mechanical refrigerators[3]	+34.9	+22.2	+44.4
Rayon	+25.2	+11.2	+60.0
Gasoline	+15.9	−10.0	+2.5
Cigarettes	+11.2	−13.3	+7.2
Trucks	+11.2	−69.5	+15.2
Electricity	+10.3	−14.6	+2.2
Tires	+9.0	−41.7	+7.9
Plate glass	+8.9	−65.4	+22.6
Silk deliveries	+8.8	−11.2	−13.2
Cottonseed oil	+8.5	−4.6	−10.4
Fuel oil	+7.8	−34.1	+4.3
Copper consumption	+7.1	−70.8	+8.2
Newsprint consumption	+6.8	−23.4	−3.6
Series relating to manufacture (cont.)			
Book paper	+6.4	−33.3	+6.7
Passenger cars	+5.7	−75.2	+10.2
Lubricating oil	+5.4	−35.2	+4.1
Steel ingots	+5.3	−75.6	+17.6
Cement	+5.2	−55.3	−7.9
Tin deliveries	+4.9	−59.1	+23.6
Canned milk	+4.5	−18.2	+3.1
Cheese	+4.4	+1.5	−17.0
Inner tubes	+4.3	−46.6	+8.7
Butter	+4.2	+6.1	+2.6
Woodpulp, chemical	+4.0	−28.4	+26.7
Sulphuric acid	+4.0	−49.0	+8.8
Fertilizers	+4.0	−40.6	+2.4
Coke	+3.9	−63.6	+9.6
Pig iron	+3.8	−79.7	+11.0
Sheep, inspected slaughter	+3.4	+28.0	−3.4
Flooring	+2.5	−73.3	+1.5
Cotton consumption	+2.5	−29.6	+18.3
Explosives	+2.4	−53.0	+4.5
Lime	+2.1	−54.1	+6.2
Boots and shoes	+1.2	−13.6	+10.0
Calves, inspected slaughter	+0.7	0	+9.9
Kerosene	+0.5	−21.9	+9.4
Woodpulp, mechanical	+0.4	−29.2	−4.2
Sugar meltings	+0.4	−22.1	−1.9
Flour, wheat	0	−15.8	+1.0
Hogs, inspected slaughter	−0.3	−6.2	+7.2
Newsprint production	−0.5	−26.9	−5.4
Cattle, inspected slaughter	−0.7	−8.0	+12.6
Cigars	−1.2	−33.0	−2.1
Wool consumption	−2.0	−34.0	+22.3
Lumber	−2.2	−72.1	+11.2
Wool carpet and rug loom activity	−2.9	−62.2	+17.8
Leather	−3.4	−23.2	+12.2
Railroad cars	−9.2	−95.3	−1.6
Locomotives	−14.6	−87.8	−9.8

[1] Most of the measurements in column 2 are from *Economic Tendencies*, pp. 253-6. The method used in calculating average annual rates of change is described in that volume.

[2] The use of the same base (1929) for the entries in columns 3 and 4 makes possible their direct comparison. The extent of the decline (or rise) through 1933 may be determined by adding, algebraically, each pair of entries.

[3] The rates of growth in column 2 for aircraft and mechanical refrigerators are for the period 1926-29.

B. NOTES ON SOURCES OF DATA AND CONSTRUCTION OF INDEXES

Figure 1. The index numbers of industrial production for the United States are those of the Federal Reserve Board. For the United Kingdom the quarterly index of the Board of Trade has been used; for France the index of the Statistique Général; for Germany that of the Institut für Konjunkturforschung; for Canada that of the Dominion Bureau of Statistics. The following tabulation, which is based upon materials from the Statistical Yearbooks of the League of Nations and original sources, summarizes the general character of the averages.

	United States	Canada	United Kingdom	France	Germany
Base year	*1923-25*	*1926*	*1924*	*1913*	*1928*
Distribution of weights					
Total	100	100	100	100	100
Mining	14	11	20	8	11
'Investment' goods[1]	39	34	29	57	40
Foodstuffs (including tobacco)	10	26	14	0	15
Textiles and textile products	18	2	19	24	18
Leather and leather products	4	3	3	8	3
Paper and printing	10	9	[2]	2	7
Other	5	15	15	1	6
Estimated percentage of industrial activity represented in index	80	80	65+	50	60
Percentage of total gainfully employed[3] engaged in					
Manufacturing	28.9	26.9	39.7	31.2	38.1
Mining	2.0	1.6	7.5	2.0	3.2

[1] Iron and steel, engineering, motor vehicles, building, building materials.
[2] Included in 'other'.
[3] The figures are from censuses taken in different years: United States, 1930; Canada and United Kingdom, 1921; France, 1926; Germany, 1925.

Table I. The population index is for continental United States. Prior to 1930, it is based on estimates of P. K. Whelpton of Miami University; since then on official estimates of the Bureau of the Census. Account is taken in the construction of these estimates of changes in births, deaths and migration. The series in column 2 is the index of net volume of agricultural production of the United States Department of Agriculture. The index numbers of mineral output in column 3 have been computed from statistics for 18 minerals compiled by the Bureau of Mines.

The index of manufacturing production in column 4 has been constructed by the National Bureau of Economic Research. The figures for 1927, 1929 and 1931 are based upon data for 145 industries reported in the *Census of Manufactures* and are similar in character to indexes of manufacturing output described in *Economic Tendencies*. Imputed weights have not been used. However, imputed weights based on arbitrary groupings of the Bureau of the Census give an index not substantially different: 1927, 100; 1929, 113; 1931, 80. (An index secured by deflating total value of product of census groups by derived index numbers of selling price is also close to those presented in Table I: 100, 115 and 84.) The figures for other than census years have been estimated on the basis of available materials. The index numbers for 1932 and 1933 are subject to revision.

The index of construction volume in column 5 covers private (residential, industrial, farm), public utility, and public (city, county, state and federal) construction. The series has been secured by roughly correcting the estimates of total value of construction for changes in construction costs. An average of the indexes of construction costs of the *Engineering News-Record* and of the Federal Reserve Bank of New York has been used for this purpose.

The index of total production is the average of the four series described above. Weights are based on gross farm income, on total value of mineral production and on total value added by manufacture and construction (the latter estimated at 50 per cent of total dollar volume) in the two years 1927 and 1931.

Table II. The index numbers of the physical volume of exports and imports in Table II are the recently revised averages of the United States Department of Commerce.

Table III. The measurements of physical volume of manufacturing used in the computation of output per man-hour are those presented in Table I and described in a previous section of this *Note*. The series on manufacturing employment is the revised index of the Bureau of Labor Statistics, which is adjusted to the total number of wage earners reported in the biennial *Census of Manufactures*. The index of hours per week shown in column 5 has been prepared as follows: (1) a weighted average of hours worked in 1932 and 1933 was calculated from the monthly reports of the Bureau of Labor Statistics. Employment figures were used as weights in securing annual averages for these two years; (2) an estimate of 49.4 hours per week actually worked in 1929 was secured by applying the relation in 1929 between actual and nominal hours for the industries in the sample of the National Industrial Conference Board to the average nominal week for all manufacturing as computed from the frequency distributions published in the *Census of Manufactures* for that year; (3) the National Industrial Conference Board sample was used to interpolate between the 1929 and 1932-33 estimates and to carry the series back to 1927.

Results obtained from the use of the Conference Board sample alone agree substantially with these more or less independently derived estimates of output per man-hour. So also does an average of a series of estimates prepared for those industries for which the necessary data are available.

Charles A. Bliss is secretary of the National Bureau and is associated with Frederick C. Mills in the National Bureau's studies of production and prices. Most of the measurements presented in this BULLETIN *are results derived in the course of this major project and extend certain of the figures given in* ECONOMIC TENDENCIES IN THE UNITED STATES, *published by the National Bureau in* 1932.

PLANNING CONFERENCE, MAY 30, 1934

To assist the National Bureau in formulating its future program, several Directors and staff members conferred with a few representatives of other research agencies, economists and business men on May 30. Those present were: Wesley C. Mitchell, presiding; James W. Angell, Henry S. Dennison, David Friday, Meredith B. Givens, Alvin H. Hansen, Charles O. Hardy, Robert M. MacIver, Sydnor Walker, David L. Wickens, Oswald W. Knauth, Shepard Morgan, M. C. Rorty, N. I. Stone, Joseph H. Willits, Martha Anderson, Charles A. Bliss, Arthur F. Burns, Simon Kuznets, Frederick C. Mills.

Dr. Mitchell opened the meeting by saying that because of the limited character of the National Bureau's dealings with monetary economics he had invited Professor Angell of Columbia University, one of the most active workers in this field, to discuss the problems encountered.

Dr. Angell contrasted purely theoretical studies and descriptive studies, primarily statistical, and asserted that in the combination of the two—skilled statistical work with the formulation of intelligent working hypotheses—lies the way of progress and the contribution of an organization like the National Bureau of Economic Research. He then described in some detail projects for the determination of the exchange velocity of money, banking adjustments between districts and the money volumes of new savings and new investment.

Dr. Mitchell then called upon Mr. Henry S. Dennison of the Dennison Manufacturing Company, a member of the advisory Council on Economic Planning appointed by the Department of Commerce. Mr. Dennison emphasized the need for planning alike in private business and in public administration. He heartily endorsed any research work that would help to make practical planning possible. In particular, methods of control must be developed to promote economic stability. As specific studies he suggested the relation of taxation to cyclical fluctuations in economic activity, the distribution of income, migration and decentralization of industries, economic nationalism and the tariff, public works, the debt structure, differences between large and small businesses as revealed by statistics being collected under the N. R. A. codes.

Dr. Friday, one of the Directors of the National Bureau, outlined the inception and purpose of the Committee on Credit and Banking of the Social Science Research Council. As elements of a study of the relation of banking policy and credit control to economic stability the Committee has set itself to investigate:

I The Growth of Capital during the Post-War Period

II The Financing of Capital Expansion and Contraction in Relation to Economic Stability

III The Role of Credit and Banking Policy in Social Control

At the request of Dr. Friday's committee, a study of the volume of durable goods produced in the United States, 1919-33, as a measure of capital formation, was undertaken by the National Bureau of Economic Research under the direction of Simon Kuznets and supported by a grant from the Social Science Research Council. An interim report of this investigation of capital formation in its physical aspects has already been circulated privately, and the next National Bureau *Bulletin* will contain a resumé of some of the preliminary estimates.

Now that the project under the first part of their program, the Measurement of the Growth of Capital during the Post-War Period, is nearing completion, the Committee has requested the National Bureau to undertake a study of Real Estate Finance and Economic Stability. Real estate mortgage financing, both agricultural and urban, will be included in the survey.

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

OSWALD W. KNAUTH, *Chairman* — GEORGE SOULE, *Vice-President*
JOSEPH H. WILLITS, *President* — SHEPARD MORGAN, *Treasurer*
CHARLES A. BLISS, *Executive Secretary*

Research Staff

WESLEY C. MITCHELL, *Director*
ARTHUR F. BURNS — F. R. MACAULAY
SIMON KUZNETS — FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, *Associate*

Directors at large

OSWALD W. KNAUTH — ELWOOD MEAD
H. W. LAIDLER — SHEPARD MORGAN
L. C. MARSHALL — GEORGE SOULE
GEORGE O. MAY — N. I. STONE

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

HUGH FRAYNE, *American Federation of Labor*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
ARCH W. SHAW, *National Publishers Association*
ROBERT B. WOLF, *American Engineering Council*

National Bureau
of Economic Research

BULLETIN 52

NOVEMBER 15, 1934

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Gross Capital Formation, 1919-1933

SIMON KUZNETS

Copyright 1934, National Bureau of Economic Research, Inc.

This *Bulletin* presents preliminary results of the study of Gross Capital Formation in the United States, begun by the National Bureau of Economic Research in the spring of 1933. This study was undertaken at the request of a special Committee on Credit and Banking of the division of Industry and Trade of the Social Science Research Council, as an initial inquiry in a program of research focussed on problems of banking policy and credit control in relation to economic stability. A mimeographed set of preliminary results of the study was released for confidential circulation in March 1934.

Throughout the study Dr. Kuznets was assisted by Mr. William H. Shaw; during part of the investigation by Miss Edith Handler, and in the early phases by Mrs. Grace W. Knott.

I. VIEWPOINT AND SCOPE OF THE STUDY

CAPITAL FORMATION comprises the production, transportation and distribution of that portion of the nation's output of goods and services which is not consumed immediately, but is retained and added to the nation's stock of wealth. If, in measuring this retained portion of current output, allowance is made for the current consumption of the already existing finished capital goods, the results show the volume of *net* capital formation. If such an allowance is not made, the volume measured is that of *gross* capital formation.

The quantitative measurement of capital formation may be undertaken from either of two essentially different viewpoints. From one viewpoint, capital formation is treated as contributing to the accumulated wealth of the nation and as augmenting the material foundation upon which its economic progress rests. Net capital formation is the concept most appropriate for such treatment. From the other viewpoint, capital formation is treated as a process which exhibits significant peculiarities in the business cycle. The total flow of commodities which, because of their durable nature represent largely investment, and which account for the bulk of gross capital formation, has been observed to show cyclical fluctuations strikingly different from those in the flow of commodities that are fully consumable within short periods. The inference is natural that in measuring separately these two parts of the nation's output some light may be thrown on factors of importance in determining the business cycle. In a study guided by such a viewpoint, the concept of gross capital formation appears more useful than that of net capital formation, certainly in the first phases of the analysis. This is especially true when such an investigation is followed by a study of the parallel flow of money and credit: there is considerable fluidity between funds set aside to cover the consumption of already existing finished capital goods (for example, reserves for depreciation) and funds for the financing of additional capital goods. Since the study, of which the preliminary results are presented in this *Bulletin,* treats capital formation as a process which exhibits significant peculiarities in the business cycle; and since it is expected that this study will be followed by a parallel study of the flow of funds, the concept of gross capital formation was adopted as the basic one. This, of course, does not preclude the possibility of measuring net capital formation, and it is hoped that such measures will be given in the final report.

Gross capital formation, as estimated in this study, is composed of the following elements:

1. The flow of finished durable commodities to the nation's households and enterprises. Households comprise families and individual final consumers, while enterprises cover not only business establishments but also public and semi-public agencies. By durable commodities are meant those with an average period of useful life in excess of three years, whether used primarily by households (consumers' durable) or by enterprises (producers' durable). Notable examples are industrial and household machinery,

passenger cars and trucks, boats, railroad equipment, tools, furniture. This group, naturally, includes construction, which in the tables below is segregated for separate measurement. The distinction between durable and non-durable commodities, and especially between consumers' and producers' commodities, is necessarily approximate, but the line can be drawn clearly in the majority of cases.

2. Net change in the stocks of all commodities in the hands of their producers and distributors; of unfinished commodities in the hands of their industrial consumers; and of finished, but fully consumable commodities in the hands of ultimate consumers. However, for lack of data, net changes in stocks in the hands of public agencies and of ultimate consumers had to be omitted in our estimates, which thus cover changes in business inventories only.

3. Net change in claims against foreign countries. In so far as we deal with a single nation in the family of nations, its exports are part of its gross capital formation, and its imports are to be subtracted from the latter.

The estimates presented below attempt to measure the volume of gross capital formation, thus defined, in the United States from 1919 through 1933. The elements just listed are evaluated in terms of both current and 1929 prices; and the valuation is in terms of the cost of each element to the ultimate agency reached during the given year. Thus, the flow of finished durable commodities to households and enterprises is measured at cost to these ultimate users, and the amounts include not only the cost of production but also of transportation and distribution of the finished durable commodities purchased by their ultimate users. Net change in business inventories is evaluated, as far as possible, at cost to the agency which holds the inventories. Only in the case of new construction, the largest part of the total in the general category of construction, was it impossible to evaluate the total at cost to the ultimate user; instead, the value of new construction is measured at the point where the process is completed by the construction enterprise.

Inclusive as this concept of gross capital formation and the estimates based upon it are, they omit almost completely two types of capital formation. One is capital formation that finds its embodiment not in commodities but in the less tangible properties of human beings themselves. Such capital formation is obviously of considerable magnitude, the volume of economic resources devoted to and embodied in the state of the arts and the training of the people forming an appreciable part of the nation's wealth. But it is difficult in this field to disentangle purely economic factors from the totality of factors that determine individual or social life as a whole; and it is next to impossible to attain a tolerable degree of precision in estimating the volume of capital formation involved. The second type of capital formation, also largely omitted, is that confined within the limits of single enterprises. It is exemplified by labor invested by a farmer in improving the quality of his land, or by wages paid by a manufacturer to his own workers for the improvement of his machinery and buildings. Some part of this activity is reflected in our inclusive estimates of the volume of construction, which cover a large part of construction done on their own account by non-construction enterprises. But the other types of capital formation in this group do not appear on the surface of the available statistical data; hence it is impossible to measure their volume.

In spite of these omissions, the concept of gross capital formation employed in this study may appear to be too wide. It may be argued that the flow of consumers' durable commodities does not constitute an element in capital formation; and, that net capital formation should have been measured rather than gross. However, neither of these restrictions of the concept is acceptable in a study of variations in the volume of capital formation in their relation to the business cycle. The flow of consumers' durable commodities is almost as variable in time as that of the producers' durable group, differing greatly in this respect from the flow of non-durable finished commodities. Also, gross rather than net capital formation, as suggested above, appears to be the appropriate basic concept in a study pointing to the analysis of business-cycle problems, at least as a first step. For these reasons it was decided to include the flow of consumers' durable commodities in capital formation, although our estimates segregate them and allow those who wish to subtract them; and to deal with gross rather than net capital formation, at least at first.[1]

II. THE AVERAGE VOLUME OF GROSS CAPITAL FORMATION AND OF THE FLOW OF NON-DURABLE COMMODITIES

It is here recognized that the average volume of capital formation and of any of its constituent elements for the period 1919-32 conceals significant variations in time, variations which are studied in Section III. The reason for discussing these average volumes for the post-War period as a whole is to show the approximate magnitude of the economic processes in question. Unless one is familiar with the average *weight* of these various elements, he cannot appreciate the significance of their variability in time, or of the differences in this variability.

Table 1 gives the average dollar volume of gross capital formation, most inclusively defined, for the period 1919-1932. The flow of durable commodities shown in this table includes not only the value of finished products, but also of parts, repairs and servicing, in so far as they can be ade-

[1] The results of an attempt to estimate net capital formation destined for use by business enterprises are presented in Table 10.

Table 1

GROSS CAPITAL FORMATION, INCLUSIVELY DEFINED, AVERAGE DOLLAR VOLUME PER YEAR, 1919-1932

	Volume per year (*millions of dollars*)	Per cent of total
1. Flow of consumers' durable commodities to households and enterprises	7,458	27.3
2. Flow of producers' durable commodities to enterprises	6,409	23.5
3. Volume of total construction	11,826	43.3
4. Total flow of finished durable commodities (1+2+3)	25,693	94.0
5. Net change in business inventories	924	3.4
6. Net change in claims against foreign countries	712	2.6
7. Gross capital formation, inclusively defined (4+5+6)	27,329	100.0

Note: Estimates in Tables 1 through 4 are given in current prices only. The correction for price changes, while affecting the annual changes of the quantities, does not alter appreciably the averages for as long a period as is covered in the tables in Section II of this *Bulletin.*

Since the estimates for 1933 are much more tentative than those for other years, it was considered advisable not to use them in computing the averages for the post-War period.

quately gauged. Similarly, construction is measured by a most inclusive estimate, which attempts to cover not only sizable new construction projects, but also maintenance and repair.

It may be seen from Table 1 that the volume of gross capital formation during the post-War period amounted on the average to $27 billion per year; that the largest single item was total construction; that the flow of other durable commodities was divided almost equally between producers and consumers, the flow to the latter slightly larger; that all finished durable commodities together accounted for over 90 per cent of the total; and that, on the average, both net change in business inventories and net change in claims against foreign countries constituted but a minor part of the gross total.

The very size of the average volume of gross capital formation in Table 1 may suggest an element of exaggeration in our estimates; and such may be argued from the inclusive character of the definitions used. It may be contended that a large proportion of repairs and maintenance is consumed within a short period, and that they are thus on a par with the flow of non-durable commodities; and that especially in the case of construction, our estimates, based on the consumption of construction materials, may contain a large volume of such minor repair work. Similar objections may be raised to the inclusion of parts: the mere fact that parts are sold separately indicates that their life is shorter than that of the durable product of which they are a constituent element. Finally, a doubt may be raised concerning the treatment of net change in business inventories. Such changes, when positive, do represent, like the flow of durable commodities, withdrawal of goods from current consumption into capital accumulation. But while a durable commodity, once produced, lasts usually an appreciable period, a change in inventories during a given year can easily be offset during the next year. In so far as the element of technical durability is of significance to the economic implications of capital formation, net change in inventories should be treated as the result of a process quite different from that involved in the flow of durable commodities, and possibly excluded from the total of gross capital formation.

Since it is impossible to segregate parts, repairs and servicing into durable and non-durable categories, the estimates in Table 1 cannot be modified precisely. But we can subtract the aggregate value of all parts and servicing; reduce the volume of total construction to a figure which can be interpreted as representing primarily new construction or very considerable alterations; subtract net change in business inventories—and thus obtain an estimate of the volume of gross capital formation, more narrowly defined. The average volume for the post-War period, which corresponds to this definition, is presented in Table 2.

A comparison of Tables 1 and 2 shows that the narrowing of the concept of gross capital formation results in a drop in the average volume of about 27 per cent. It still leaves, however, a strikingly high average volume of $20 billion, which is apportioned among the various constituent elements of gross capital formation in about the same way

Table 2

GROSS CAPITAL FORMATION, MORE NARROWLY DEFINED, AVERAGE DOLLAR VOLUME PER YEAR, 1919-1932

	Volume per year (*millions of dollars*)	Per cent of total
1. Flow of consumers' durable commodities, exclusive of parts and servicing	6,140	30.7
2. Flow of producers' durable commodities, exclusive of parts and servicing	4,800	24.0
3. Volume of construction, exclusive of maintenance, repairs and the unallocable portion[1]	8,372	41.8
4. Total flow of finished durable commodities, more narrowly defined (1+2+3)	19,312	96.4
5. Net change in claims against foreign countries	712	3.6
6. Gross capital formation, more narrowly defined (4+5)	20,024	100.0

[1]For the explanation of the unallocable part, see Table 11 and comments in Section 2 of the Appendix.

as in Table 1. Total construction still remains the largest single item; the flow of consumers' durable commodities is still somewhat greater than that of producers' durable commodities; and with the omission of net changes in inventories, the importance of elements other than the movement of finished durable products becomes still more insignificant.

Whether the flow of consumers' durable commodities should or should not be included in gross capital formation, it is nevertheless important to ascertain the distribution of the latter total according to the economic characteristics of the ultimate user. The demand for capital goods by business firms is subject to the play of forces distinctly different from, even though related to, those affecting the demand for capital goods by households, or public and semi-public agencies. Table 3 presents an apportionment of gross capital formation in accordance with this principle of distinction. The classification is approximate, and can, at present, be carried back only to 1925. But subject to these limitations, the main results of the distribution are clear and appear reliable.

First, the approximate equality of weight between capital destined for use by business and that destined for use by consumers stands out; second, the relatively limited role played by public and semi-public agencies as the ultimate users of capital goods, accounting for 11 to 15 per cent of the total. It must be noted, however, that this proportion is an underestimate, since consumers' and producers' durable commodities which are eventually used by public agencies could not be segregated here, and line 3 in Table 3 thus covers only construction.

Formation of capital destined for use by final consumers is apportioned, in this table, between the flow of consumers' durable commodities and residential construction, since most students of the problem treat residential construction as *bona fide* capital formation, even though some exclude other consumers' durable products from the group of capital goods. The table indicates that the flow of consumers' durable commodities accounts for about one-third of total gross capital formation, whether the latter is defined inclusively or more narrowly. Residential construction accounts for an additional one-tenth of the total.[3] Even when both are excluded, the average volume of gross capital formation still amounts to $17 billion, when defined inclusively; and to $12 billion, when defined more narrowly. If residential construction is retained as part of capital formation the two average volumes become $19 and $14 billion.

The absolute figures for gross capital formation, striking as they are in their magnitude, do not tell the full story until compared with the volume of the other portion of the nation's output—that flowing into immediate consumption channels. This other portion consists of nondurable commodities and related services; and of services which are rendered directly to final consumers, such as professional and other personal services, transportation and communication services performed for ultimate consumers. Of these two groups of goods in the nation's immediately

[3] The percentage of gross capital formation, inclusively defined, constituted by residential construction is underestimated in Table 3, since the unallocable portion includes some construction that should be classified as residential.

Table 3

Formation of Gross Capital by Type of Ultimate User, Average Dollar Volume per Year, 1925-1932

	Gross Capital Formation, inclusively defined		Gross Capital Formation, more narrowly defined	
	Volume per year (*millions of dollars*)	Per cent of total	Volume per year (*millions of dollars*)	Per cent of total
1. Destined for use by consumers				
a. Flow of consumers' durable commodities	7,987[1]	29.3	6,450[2]	31.5
b. Residential construction	2,066	7.6	2,066	10.1
c. Total	10,053	36.9	8,516	41.6
2. Destined for use by business	11,348[3]	41.7	8,541[4]	41.8
3. Destined for use by public and semi-public agencies (construction only)	3,067[5]	11.3	3,005[6]	14.7
4. Unallocable	2,768[7]	10.2	386[8]	1.9
5. Total gross capital formation (1c+2+3+4)	27,236	100.0	20,448	100.0

[1] Includes parts, repairs and servicing.
[2] Excludes parts, repairs and servicing.
[3] Includes flow of producers' durable commodities, volume of business construction and net change in business inventories.
[4] Same as 3 excluding parts, repairs and servicing of producers' durable commodities, maintenance and repair in business construction, and net change in business inventories.
[5] Includes public works and construction of theaters, lodges, clubs, religious and memorial structures.
[6] Same as 5 excluding repairs and maintenance in Federal construction.
[7] Includes net change in claims against foreign countries and unallocable construction.
[8] Includes net change in claims against foreign countries.

consumed output, i.e., of the output *not* entering gross capital formation, only the first—the flow of non-durable commodities and related services—has been measured adequately in the present investigation. The average volume of this flow is given in line 1 of Table 4.

The flow of non-durable commodities to households and enterprises comprises the volume of finished commodities whose period of average useful life is less than three years, estimated in terms of the cost of these commodities to their ultimate users. Adding to this flow of non-durable products the flow of durable commodities and the volume of construction, both inclusively defined, we therefore obtain, in line 2 of Table 4, the total flow of all finished commodities and related services. Of this total flow of finished commodities and related services to the nation's households and enterprises, finished durable goods and construction, defined inclusively, account, on the average, for 45 per cent. When parts, repairs, servicing and unallocable construction are treated as non-durable, the percentage of finished durable to the total of finished commodities declines to about 34. Thus, those goods whose useful life extends beyond three years are still of considerable weight in the nation's output of finished commodities.

If to the flow of non-durable commodities and related services we add the full volume of gross capital formation, inclusively defined, the resulting total measures gross domestic production of commodities and related services (line 4, Table 4). This total is gross in the sense that no adjustment is made for the consumption of finished capital goods incurred in producing the volume in question; but it is adjusted for any duplication between raw materials, semi-finished products, and finished goods. Of this gross output of commodities and related services, corrected for duplications but unadjusted for consumption of finished capital goods, gross capital formation, when inclusively defined, accounts for 46 per cent; when more narrowly defined, for 34 per cent; and with further exclusion of consumers' durable commodities, for about 24 per cent. Thus, according to the most restricted definition, gross capital formation still constitutes a substantial portion of the nation's gross output of commodities and related services.

Finally, we may attempt to indicate, even though tentatively, the importance of gross capital formation when compared with the most inclusive total, viz., the nation's gross domestic output of commodities and *all* services, corrected for duplications but not for business consumption of existing, finished durable goods. A study of the industrial allocation of national income produced suggests that in 1929 the volume of services not directly related to the production, transportation and distribution of commodities was about $17.5 billion. In the same year gross domestic output of commodities and *related* services amounted to $71.3 billion, and gross capital formation, most inclusively defined, to $34.5 billion (see Table 5).

Table 4

GROSS CAPITAL FORMATION AND THE FLOW OF NON-DURABLE COMMODITIES, AVERAGE DOLLAR VOLUME PER YEAR, 1919-1932 AND 1925-1932

	Average for 1919-32	Average for 1925-32
1. Flow of non-durable commodities to households and enterprises (*millions of dollars*)	32,030	31,869
2. Total flow of all finished commodities and related services (1+flow of durable commodities and volume of construction, inclusively defined) (*millions of dollars*)	57,724	58,618
3. Percentage of (2) constituted by all finished durable commodities (including construction)		
a. Inclusively defined	44.5	45.6
b. Excluding parts, repairs and servicing and unallocable construction	33.5	34.1
4. Gross domestic production of commodities and related services (1+ gross capital formation, inclusively defined) (*millions of dollars*)	59,360	59,106
5. Percentage of (4) constituted by gross capital formation		
a. Inclusively defined	46.0	46.1
b. Excluding parts, repairs and servicing, unallocable construction, and changes in business inventories	33.7	34.4
c. Total under b, excluding consumers' durable commodities	23.4	23.5
d. Total under c, excluding residential construction	(not available)	20.0

Thus in 1929, gross capital formation, inclusively defined, accounted for about 48 per cent of the gross domestic output of commodities and *related* services, and for about 39 per cent of the gross domestic output of commodities and *all* services. It may be suggested in the light of these figures for 1929 and the percentages shown in Table 4, that of the inclusive total of gross domestic output of commodities and all services, gross capital formation, inclusively defined, constituted on the average about one-third; gross capital formation, with the exclusion of parts, repairs, servicing and unallocable construction, about one-quarter; and with the still further exclusion of consumers' durable goods (but not of residential construction), slightly more than one-sixth.

III. FLUCTUATIONS IN GROSS CAPITAL FORMATION AND IN THE FLOW OF NON-DURABLE COMMODITIES

Having established the substantial proportion that gross capital formation constitutes of the nation's total output of commodities and services, we may study the fluctuations in

Table 6

RISE AND DECLINE IN THE MAJOR MOVEMENT OF 1921-33 IN THE VARIOUS ELEMENTS OF GROSS CAPITAL FORMATION, INCLUSIVELY DEFINED, AND IN THE FLOW OF NON-DURABLE COMMODITIES

	Rise, decline and total swing as percentages of the values in 1929					
	A. *Current Prices*			B. *1929 Prices*		
	Rise from 1921 to 1929	*Decline from 1929 to 1933*	*Total swing*	*Rise from 1921 to 1929*	*Decline from 1929 to 1933*	*Total swing*
1. Flow of consumers' durable commodities	44.7	62.8	107.5	56.0	55.1	111.1
2. Flow of producers' durable commodities	40.2[2]	68.6	108.8	42.8	61.5	104.3
3. Volume of total construction	42.1[2]	67.0[3]	109.1	47.8[5]	58.3[3]	106.1
4. All durable commodities	39.3	64.6	103.9	43.6	56.4	100.0
5. Gross capital formation	44.4	77.4[4]	121.8	49.4	74.1[4]	123.5
6. Flow of consumers' perishable commodities	25.9	43.2	69.1	25.7[6]	13.4[4]	39.1
7. Flow of consumers' semi-durable commodities	18.3[1]	47.3[4]	65.6	45.1[6]	24.5	69.6
8. Flow of non-durable finished commodities	23.6	44.3[4]	67.9	31.5[6]	15.2	46.7

[1]1922-1929. [3]1928-1933. [5]1920-1928.
[2]1921-1928. [4]1929-1932. [6]1920-1929.

29.2 in 1920, 11.6 in 1923, 8.0 in 1926 and 4.9 in 1929; for volumes in 1929 prices, the corresponding percentages were 23.4, 11.6, 7.2 and 4.9. One may conclude, therefore, that while the net change in business inventories and net change in claims against foreign countries are of minor importance in the *average* volume of gross capital formation over a considerable period, these two elements, especially the former, affect the annual fluctuations in the volume of gross capital formation significantly. A second conclusion is that the downward trend of these two elements, especially of net change in business inventories, offsets to some extent the consistent rise in the volume of finished durable commodities during the period 1921-29, thus suggesting a shift from capital formation in the form of inventories to that in the form of finished durable commodities.

In analyzing the timing and amplitude of variations shown by gross capital formation and most of its constituent elements, as well as by the flow of non-durable commodities, the comparisons and measurement could be advantageously subdivided into two groups: those for the major movement from 1921 to 1933, and those for the years of recession and depression in business at large, not included under the major movement, viz., 1924 and 1927. The evidence in respect of the timing and amplitude of the changes in the major movement from 1921 to 1933 is presented in Table 6. The conclusions may be summarized as follows:

1. In so far as timing can be judged from annual data, most of the elements of capital formation and of the flow of non-durable commodities show in the major movement a trough in 1921, a peak in 1929, and a trough in 1933. But in a few of the elements there is some departure from these dates. The flow of producers' durable and of consumers' semi-durable commodities, when measured in current prices, shows the first trough in 1922 instead of 1921; while in the estimates in 1929 prices the first trough in the flow of both consumers' perishable and semi-durable commodities occurs in 1920. The volume of construction, both in current and 1929 prices, reaches its peak in 1928 rather than in 1929. Finally, a number of the elements reach their trough in 1932 rather than in 1933: gross capital formation in both current and 1929 prices, flow of consumers' semi-durable commodities in current prices, of perishable commodities in 1929 prices, and the total flow of non-durable, finished commodities in current prices. But by and large, the similarity of the timing of the various processes listed in Table 6 in the major movement from a trough in 1921 to a peak in 1928 or 1929 to a trough in 1932 or 1933, is sufficiently great to allow comparisons of the amplitudes of their fluctuations.

2. In respect of amplitude, the movement in the flow of consumers' durable commodities, producers' durable commodities, and the volume of construction is much the same, whether the volumes are measured in current or 1929 prices. Similarly, the percentage rise to 1928 or 1929 and the percentage decline thereafter is fairly similar for these three elements, with the following interesting exceptions: (a) the flow of consumers' durable commodities shows a greater rise to 1929 than the other two elements, both in current and in 1929 prices; (b) the flow of producers' durable commodities, while showing the smallest rise to 1929 of the three elements, shows the greatest decline from 1929 to 1933. This result may be somewhat affected, in the case of the volumes measured in 1929 prices, by the inadequacy of price indexes for producers' durable commodities; and in the case of construction, whether in current or 1929 prices, by possible errors in our estimate. For this reason the difference just noted in the amplitude of rise and decline in the three parts of the total of finished durable commodities should be treated as highly tentative.

Chart II

PERCENTAGE DISTRIBUTION OF THE TOTAL FLOW OF FINISHED COMMODITIES

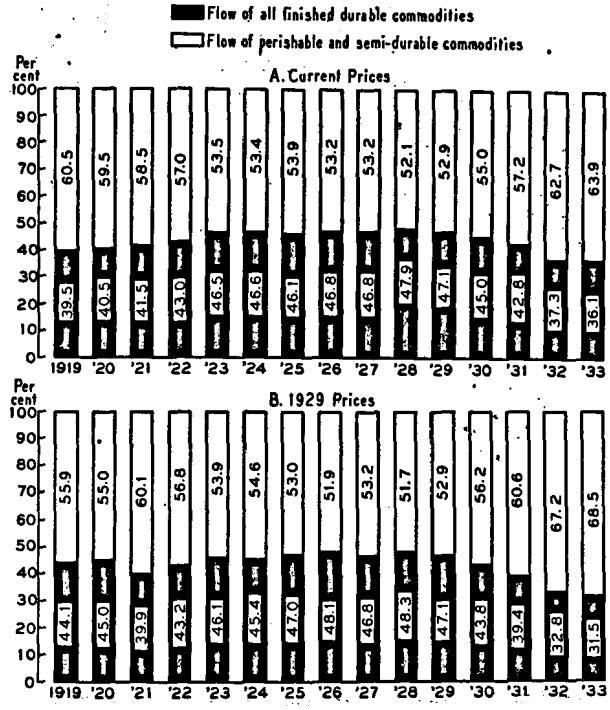
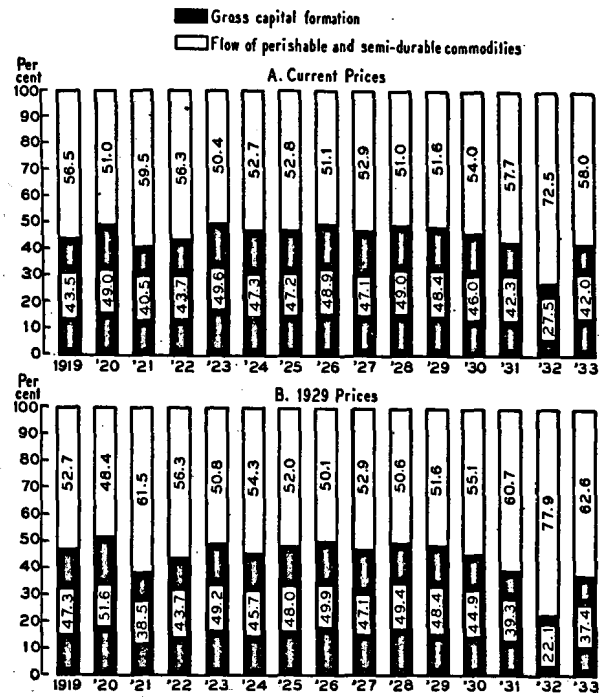


Chart III

PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC COMMODITY OUTPUT



3. Gross capital formation, both in current and in 1929 prices, shows a rise to 1929 and a decline to 1932 significantly larger than that in the total of all durable commodities. This difference is obviously due to the inclusion in gross capital formation, widely defined, of net change in business inventories, which is negative in 1921 and 1932 and positive in 1929. We can thus estimate the amplitude of gross capital formation, were it defined more narrowly. The exclusion of parts, repairs, servicing and unallocable construction would increase the amplitude over that shown in Table 6, because it would reduce the total to which negative change in business inventories in 1929 and 1932, and positive change in 1929, would be added. The further exclusion of net change in business inventories would, however, reduce the amplitude of the movement of gross capital formation below that shown in Table 6, bringing it down to that indicated for the total of all durable commodities. The further exclusion of consumers' durable commodities would leave the amplitude at about the same level as is shown in line 4 of Table 6.

4. The most significant result of the comparison is the appreciably greater amplitude of the movement in gross capital formation and in the total of all finished durable commodities compared with that of the flow in the non-durable groups. This difference is true of the total swing in the volumes, in both current and 1929 prices; of the rise to 1929 in both current and 1929 prices, with the single exception of the flow of semi-durable commodities in 1929 prices; and of the decline after 1929, in volumes both adjusted and unadjusted for price changes.

5. The difference in the magnitude of the decline after 1928 or 1929 between gross capital formation and finished durable commodities on the one hand, and the non-durable group on the other hand, is so appreciable and developed over so brief a period, that there is little doubt as to its significance or its persistence from year to year. But it may be contended that the disparity in the magnitude of the rise to 1929, shown in Table 6, is due only to the greater severity of the depression of 1921 in gross capital formation and in the flow of commodities in the durable groups; and that were we to observe the movement say from 1923 to 1929 (instead of from 1921 to 1929), such a disparity would not be found in the magnitude of the rise of the different groups in the nation's total output.

Some light on this contention is cast by Charts II and III which show the percentages formed by all durable commodities of all finished commodities, and by gross capital formation of the gross domestic output of all commodities. Chart II indicates that in current prices the percentage of finished durable in the total of all finished commodities rose steadily from 1919 to 1924, and then, after a slight decline in 1925, rose further to a peak in 1928.

In estimates in 1929 prices the movement of the same percentage is somewhat less sustained, showing a decline in every year of recession in business at large (1921, 1924 and 1927). But if we observe the peak years of business at large, we find the percentage increasing from 1920 to 1923, from 1923 to 1926, and from 1926 to 1928.

Since gross capital formation is more susceptible to variations at frequent intervals than the total of durable commodities, its percentage to gross domestic output of all commodities and services manifests less of a sustained movement than the percentages in Chart II (see Chart III). Nevertheless, the existence of an upward movement in these percentages from 1921 to 1928 is indicated with considerable consistency. Also, in both charts, the decline in the relative importance of finished durable commodities or of gross capital formation after 1928 is shown to be consistently sustained from year to year, until the trough is reached. The charts thus confirm the conclusion that the disparity in the amplitude of movement between gross capital formation and the volume of all durable commodities on the one hand, and the flow of non-durable commodities on the other, was a fairly sustained difference, both in the rise to 1928 or 1929, and in the decline thereafter to 1932 or 1933.

We may now consider the fluctuations in the various elements of gross capital formation and of the gross domestic output during those years of contraction in business at large, 1924 and 1927, which were not treated in connection with the major movement from 1921 to 1933. Annual data are, of course, a fallible guide in the study of cyclical contractions of that order, especially if we consider that the peak in general business activity in 1923 was reached about May, and in 1926 about October; and that the trough in general business activity in 1924 occurred about July and in 1927 about December. The annual averages are thus bound to distort the comparative magnitude of decline in these two contractions, and no attention should be paid in Table 7 to the difference in the magnitude or direction of change between the two periods covered. It is believed, however, that the general differences in the changes among the various groups of finished commodities and gross capital formation are sufficiently reliable to merit attention. The evidence of Table 7 may be summarized as follows:

1. Gross capital formation, whether measured in current or 1929 prices, shows the greatest susceptibility to the recessions of 1924 and 1927. The total volume of durable commodities reflects these depressions in a much milder fashion, especially when the volume is measured in 1929 prices. We can infer, therefore, that the susceptibility to these recessions of gross capital formation is due primarily to net change in business inventories.

2. Of the three component elements of the total of durable commodities, only the producers' durable group shows consistently a significant decline during these years of contraction in business at large. This is true for volumes measured both in current and 1929 prices.

3. The flow of non-durable commodities does reveal some susceptibility to the contractions in question, when the volume is measured in current prices. When correction for price changes is introduced, however, such susceptibility is not manifested. Neither perishable nor semi-durable commodities, taken singly, reveal a consistent response to these contractions in business at large.

4. Gross capital formation as a whole, and the flow of producers' durable commodities, show a greater decline from 1923 to 1924, and from 1926 to 1927, than does the flow of non-durable commodities.

It might be expected that the fluctuations in the various categories of gross capital formation, when the latter is

Table 7

Change from 1923 to 1924, and from 1926 to 1927, in the Various Elements of Gross Capital Formation, inclusively defined, and in the Flow of Non-durable Commodities

	Change in percentages of the value in 1923 and 1926, respectively					
	A. *Current Prices*			B. *1929 Prices*		
	Change from 1923 to 1924	1926 to 1927	*Average change*	*Change from* 1923 to 1924	1926 to 1927	*Average change*
1. Flow of consumers' durable commodities	5.5	—4.6	.45	8.0	—5.6	1.20
2. Flow of producers' durable commodities	—6.4	—3.3	—4.85	—9.9	—3.2	—6.55
3. Volume of total construction	—0.1	3.7	1.80	1.0	4.2	2.60
4. All durable commodities	—0.1	—0.4	— .25	0.1	—0.6	— .25
5. Gross capital formation	—9.3	—7.2	—8.25	—10.2	—6.6	—8.40
6. Flow of consumers' perishable commodities	4.3	—1.9	1.20	7.7	2.4	5.05
7. Flow of consumers' semi-durable commodities	—10.1	3.8	—3.15	—7.9	10.1	1.10
8. Flow of non-durable commodities	—0.6	—0.2	— .40	3.0	—0.5[1]	1.25

[1]Trough in 1928.

Table 8

FORMATION OF GROSS CAPITAL, INCLUSIVELY DEFINED, BY TYPE OF ULTIMATE USER, 1925-1933

Current and 1929 Prices
(*millions of dollars*)

A. *Current Prices*

Destined for use by	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*[2]
1. Consumers									
a. Consumers' durable commodities	8,664	9,316	8,887	9,175	10,058	7,892	5,885	4,022	3,737
b. Residential construction	3,050	2,965	2,856	3,095	2,127	1,222	900	311	276
c. Total	11,714	12,281	11,743	12,270	12,185	9,114	6,785	4,333	4,013
2. Business									
a. Total of producers' durable commodities, business construction and net change in business inventories	12,998	15,605	12,433	13,570	15,980	12,752	7,245	204	7,262
b. Total, exclusive of net change in business inventories	12,082	12,941	12,609	13,059	14,606	12,036	7,970	4,664	4,292
3. Public and semi-public agencies Total of public work construction and theatres, clubs, lodges, religious and memorial construction	3,103	2,997	3,438	3,334	3,000	3,488	3,035	2,144	3,604
4. Unallocable Total of net change in claims against foreign countries and unallocable construction	2,891	2,688	3,543	4,760	3,326	2,184	1,656	1,099	
5. Gross capital formation									
a. 1c+2a+3+4	30,706	33,571	31,157	33,934	34,491	27,538	18,721	7,780	14,879
b. 1c+2b+3+4	29,790	30,907	31,333	33,423	33,117	26,822	19,446	12,240	11,909

B. *1929 Prices*

Destined for use by									
1. Consumers									
a. Consumers' durable commodities	8,733	9,734	9,189	9,343	10,058	8,223	6,544	4,690	4,513
b. Residential construction	3,059	2,965	2,862	3,104	2,127	1,262	1,077	420	387
c. Total	11,792	12,699	12,051	12,447	12,185	9,485	7,621	5,110	4,900
2. Business									
a. Total of producers' durable commodities, business construction and net change in business inventories	12,944	15,273	12,470	13,530	15,980	13,303	8,289	—843	9,281
b. Total, exclusive of net change in business inventories	12,139	12,901	12,662	13,051	14,606	12,470	8,801	5,641	5,359
3. Public and semi-public agencies Total of public work construction and theatres, clubs, lodges, religious and memorial construction	2,664	2,669	3,108	3,221	3,000	3,747	3,639	3,239	4,483
4. Unallocable Total of net change in claims against foreign countries and unallocable construction	2,785	2,599	3,459	4,718	3,326	2,295	1,952	1,498	
5. Gross capital formation[1]									
a. 1c+2a+3+4	30,185	33,240	31,088	33,916	34,491	28,830	21,501	9,004	18,664
b. 1c+2b+3+4	29,380	30,868	31,280	33,437	33,117	27,997	22,013	15,488	14,742

[1]The more inclusive estimates of gross capital formation (line 5a) differ slightly from the equivalent figures presented in Table 5 (part B, line 7) since, in the above table, the values in current prices of the various types of construction were deflated separately, whereas in Table 5, the total volume of construction was estimated in 1929 prices by use of a single composite index of cost of construction.

[2]Preliminary.

Table 9

PERCENTAGE DECLINE IN THE FORMATION OF GROSS CAPITAL, BY TYPE OF ULTIMATE USER, 1928-1933

Destined for use by	Terminal years between which change is computed	Current prices	1929 prices
1. Consumers			
a. Consumers' durable commodities	1929-33	62.8	55.1
b. Residential construction	1928-33	91.1	87.5
c. Total	1928-33	67.3	60.6
2. Business			
a. Total	1929-32	98.7	[1]
b. Total, exclusive of net change in business inventories	1929-33	70.6	63.3
3. Public and semi-public agencies	1930-32	38.5	13.6
4. Unallocable	1928-32	76.9	68.2
5. Gross capital formation			
a. 1c+2a+3+4	1929-32	77.4	73.9
b. 1c+2b+3+4	1928-33	64.4	55.9

[1]The entry for 1932 is a negative value.

classified by type of ultimate user (business, consumers, etc.) would show significant differences in amplitude, and possibly in timing; and this surmise is supported by the results of the comparison made above between the flow of consumers' durable and that of producers' durable commodities. Unfortunately, annual data on gross capital formation by type of ultimate user extend only to 1925, and allow us to study the differences in the magnitude of the decline after 1929 alone.

The annual estimates are given in Table 8, while Table 9 shows the relative decline of the various groups of gross capital formation during the recent business depression. The conclusions which the tables suggest may be summarized as follows:

1. Of the four groups, formation of gross capital destined for business use shows the most drastic decline whether the measurement is in current or 1929 prices. This is especially true when net change in business inventories is included, but holds also when this element is excluded.

2. Construction for public and semi-public agencies, the only element which could be segregated under formation of gross capital destined for use by public and semi-public enterprises, shows the mildest decline of all. This is true of the comparison both in current and in 1929 prices.

3. Formation of gross capital destined for use by consumers did not decline as drastically as that destined for business use. But the difference in the magnitude of the decline in these two groups is not appreciable, when net change in business inventories is omitted from gross capital destined for business use.

4. In so far as the estimates for 1933 can be relied upon,

Table 10

FORMATION OF NET CAPITAL, DESTINED FOR BUSINESS USE, 1925-1933

Current Prices
(*millions of dollars*)

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*[1]
1. Formation of gross capital, destined for business use									
a. Exclusive of parts, repairs and servicing and repairs and maintenance of business construction	9,986	12,479	9,379	10,530	12,770	10,052	5,208	—1,255	5,864
b. Same as (a) excluding changes in business inventories	9,070	9,815	9,555	10,019	11,396	9,336	5,933	3,205	2,894
2. Depreciation and depletion	4,673	5,162	5,169	5,439	5,800	5,800	5,586	5,084	4,922
3. Various estimates of the formation of net capital destined for business use									
a. 1a—2	5,313	7,317	4,210	5,091	6,970	4,252	—378	—6,339	942
b. 1b—2	4,397	4,653	4,386	4,580	5,596	3,536	347	—1,879	—2,028

[1]Preliminary.

and in so far as annual averages can be used to reveal properly the timing of cyclical processes, recovery from 1932 to 1933 has occurred in the formation of gross capital destined for business use, inclusive of net change in business inventories, and in construction for public and semi-public agencies. Thus, the rise from 1932 to 1933 in gross capital formation was due to an increase in inventories and to a rise in public construction.

In concluding this discussion, it may be of interest to present a tentative estimate of formation of net capital destined for business use. The difficulty of passing from gross to net capital formation, that is, the difficulty of correcting for the consumption of existing durable commodities, is not only in the lack of data. The very concept of annual consumption of commodities that last over a number of years suffers from ambiguity.

The estimate presented below of formation of net capital destined for business use is based on the assumption that the allowance for depreciation and depletion on the books of business firms describes correctly the volume of consumption of already existing, finished durable goods used by business firms. But we cannot assume with equal validity that this figure covers the consumption of parts, servicing, repairs and maintenance, a large portion of which is treated on the books of the business firms under maintenance charges. It is therefore best to subtract depreciation and depletion from gross capital (destined for business use), not inclusively defined, but exclusive of parts, repairs, and servicing. This still leaves two variants of formation of net capital destined for business use: one in which net change in business inventories is taken into account, the other in which it is excluded (see Table 10).

The striking decline in formation of net capital destined for business use is shown quite clearly in Table 10. In the first variant, inclusive of net change in business inventories, the peak is somewhat higher in 1926 than in 1929, and the negative figure for 1932 is truly striking. In the second variant, exclusive of net change in business inventories, the peak is markedly in 1929, and the trough is reached not in 1932 but in 1933.

Of course, these estimates have to be treated with considerable caution. Obviously, in periods of such rapid change in economic conditions as that since 1925, the disparity between actual annual consumption of durable business capital and the depreciation and depletion allowance may be both large and variable. But the conclusions that the formation of net capital destined for business has declined much more drastically than gross capital formation of the same type, and that the former quantity was negative over a considerable period of the recent depression, appear to be warranted by the evidence.

IV. SUMMARY

Subject to the limitations imposed by the tentative character of our estimates, and by the annual character of the data, our main conclusions may be stated as follows:

1. Gross capital formation constituted during the post-War period a considerable portion of the nation's total production. Of the total output of commodities and services, corrected for duplications but not for the consumption of already existing finished durable commodities, gross capital formation, inclusively defined, accounted for about one-third. When parts, servicing, repairs and unallocable construction were classified in the non-durable group, the proportion fell to about one-quarter; and when a further reduction in gross capital formation was made by the exclusion of consumers' durable commodities, the weight in the total was reduced to slightly more than one-sixth. In view of the extreme variability of the flow of consumers' durable goods, its inclusion in gross capital formation, from the viewpoint of this study, was necessary. We may say, then, that under the narrowest definition of the concept of gross capital formation appropriate to the study, the proportion of gross capital formation in a corresponding total of the nation's output of commodities and services was about one-quarter.

2. Both in the major swing from 1921 to 1933, and in the years marking general business contractions, other than that which formed a phase of the major swing, 1924 and 1927, the fluctuations in the volume of gross capital formation were of an appreciably greater amplitude than those in the flow of non-durable commodities.

3. The greater amplitude of variations in gross capital formation in the major swing from 1921 to 1932 was due largely to the fact that the flow of consumers' durable commodities, of producers' durable commodities and the volume of total construction, each showed a greater rise to 1928 or 1929, and a greater decline to 1932 or 1933, than those observed in the flow of non-durable commodities.

4. The greater susceptibility of gross capital formation to the contractions of 1924 and 1927 was due to the fluctuations in business inventories and in the flow of producers' durable commodities. These two elements of gross capital formation, especially the former, appear much more sensitive to the cyclical fluctuations in business at large than the other elements of gross capital formation or than the flow of non-durable commodities.

5. Formation of net capital destined for business use declined during the recent depression much more drastically than did formation of gross capital destined for business use. During a considerable period of the recent depression, the value of net capital destined for business use was negative.

6. In so far as the preliminary estimates for 1933 can be trusted, and the timing of cyclical processes can be judged from annual data, the recovery in gross capital formation from 1932 to 1933 was due primarily to the increase of business inventories and the rise in public construction. When measured in current prices, the flow to households and enterprises of durable and of non-durable commodities has shown little change from 1932 to 1933. In terms of 1929 prices this total flow has shown a slight decline from 1932 to 1933.

In conclusion, a note of caution must be sounded with respect to the interpretation of the differences in movement between gross capital formation and the flow of non-durable commodities. Estimates such as are presented in this *Bulletin* are easily assumed to warrant the judgment that the disparities in the movements of the various economic elements during the period 1921-1929 represented a disturbance of the general economic equilibrium, and that both the absolute decline after 1929 and the disparities in the severity of this decline offer an example of the compensatory action of our economic mechanism. In view of this tendency to identify quantitative disparities with indications of abnormality, and quantitative similarities with indications of the existence of an equilibrium, it is important to point out that such disparities or similarities *in themselves* are not a sufficient basis for such a judgment. Gross capital formation may increase more rapidly, less rapidly or *pari passu* with the flow of non-durable commodities. This by itself indicates no over-investment, under-investment or the proper rate of investment of the national product in capital goods. Before judgment can be rendered, the disparity or similarity of the rates of change of these two streams in the total product must be related to parallel phenomena in the allocation of purchasing power, and interpreted in terms of long- and short-term aspects of supply and demand for the various groups of commodities subsumed under the broad divisions. The measurements offered in this *Bulletin* constitute only one among several sets of data needed to judge the economic implications of the changes which have occurred during the last fifteen years in the country's economic system.

APPENDIX

STEPS IN THE DERIVATION OF THE ESTIMATES AND SOME FURTHER DETAILS ON THE VOLUME OF PRODUCTION, CONSTRUCTION AND INVENTORIES

This Appendix describes briefly the data and our methods of estimating the formation of gross capital. It also supplies a few further details relating to the volume of production, construction and inventories. Both should provide a better foundation for understanding and interpreting the basic estimates discussed in the text.

1. *Output and Flow of Finished Commodities*

The essential steps in estimating the flow of finished commodities to households and enterprises may be outlined as follows:

(a) From the biennial *Census of Manufactures,* by a careful study of the value of products, the output of finished manufactured goods—inclusive and exclusive of parts—was estimated, in current prices at the factory door. For intercensal years these values were approximated with the help of various interpolating indexes, formed from data for Pennsylvania, from figures of *Statistics of Income* on corporate sales, and from other data available on the annual volume of manufacturing production. To the resulting value of manufactured goods was added—on a basis of data from the Bureau of Mines, the Department of Agriculture, and the Bureau of Fisheries—the value of output of finished, non-manufactured commodities, such as coal (used by final consumers), and some of the finished products of agriculture (milk, vegetables, fruits, fish, etc.). The final results were estimates of annual output of finished products, inclusive and exclusive of parts in so far as they are segregable, in current prices. The wholesale prices, as published by the Bureau of Labor Statistics, were used, group by group, to correct these totals for price changes. Thus we obtained the estimates of total output of finished products (inclusive of parts), in current and in 1929 prices.

(b) In passing from these estimates of the output of finished goods to the estimates of the flow of finished goods to households and enterprises, two adjustments were made: (i) for imports and exports; (ii) for changes in stocks in the hands of distributors. The former adjustment was based on the data on foreign trade of the Bureau of Foreign and Domestic Commerce, while the latter was based on our indexes of stocks of finished goods in the hands of distributors. The derivation of these indexes is discussed in Section 3 of the Appendix. Step (b) resulted in estimates of flow to domestic households and enterprises of the various groups of finished products, in current and in 1929 prices at the factory door.

(c) The addition for transportation charges and for distributive margins was made with the help of a rather detailed study of the *Census of Agriculture, of Mines and Quarries, of Manufactures* and *of Distribution* for 1929. For this year, for most of the commodity groups, we were able to estimate the flow of finished products at manufacturers' prices, and the total cost of this flow to ultimate users. (For most of the perishable commodities, the Census of Distribution was found deficient, and a somewhat different procedure—that of adding successive distributive margins to the value at manufacturers' or producers' prices was used.) The comparison of the two yielded th

approximate total spread between the value of finished commodities at the factory door and their value as they reached the households and enterprises. A study of the materials available on distributive margins and transportation charges indicated that the relative spread had undergone relatively little change during the post-War period, with the possible exception of 1919-21; and the evidence on the whole, justified the application of the total relative spread as ascertained in 1929 to all the other years in the period. This total relative spread, applied as a percentage to the flow of the goods, in current and in 1929 prices, yielded the estimates of the flow of the various groups of finished commodities to households and enterprises, at cost to the latter.

(d) Finally, the estimates of the cost of servicing and repairs were derived from the *Census of Manufactures* for the odd years 1919, 1921, etc.; and from the *Census of Distribution* for 1929. From the latter the charges for servicing of automobiles only were taken and extrapolated for other years by an index representing the number of passenger cars registered and an index of prices of consumers' durable commodities. The addition of the resulting estimates of the cost of repairs and servicing to the estimates arrived at as a result of step (c) provided the most inclusive figures of the flow of finished commodities to households and enterprises. Even these estimates fall short, since they do not include servicing provided by establishments other than retail or manufacturing firms, and omit servicing by retail firms in connection with consumers' durable commodities other than passenger cars.

The analysis of the various estimates used in the procedure just described reveals some interesting results, a few of which may be mentioned here. For example, the total spread between the value at the manufacturers' and producers' door and the cost to ultimate users of finished perishable commodities is 33 per cent of the latter figure, or 49 per cent of the former. Similar percentages for the other groups of finished commodities are: for semi-durable commodities, 30 and 43; for consumers' durable, 31 and 45; and for producers' durable, 15 and 17. The difference in the size of the total spread between producers' durable and all other finished commodities is quite striking. It is obviously due to the fact that a large proportion of producers' durable commodities is manufactured on an order basis and flows directly from the manufacturer to the ultimate user; and that the distributive services needed for a proper satisfaction of the demand for producers' goods, a large proportion of which comes from a few large business units, are much more limited than the services needed to distribute the other groups of goods to the vast number of households which demand them.

As a consequence of this difference in spread, the importance of perishable, semi-durable and consumers' durable commodities (exclusive of servicing) in the total of all finished commodities increases, and that of producers' durable commodities declines, as we pass from the measurement of output to that of the flow to households and enterprises. When, however, the allowance for servicing is added, it is found that the largest part is in connection with producers' durable goods. Consequently, the inclusion of servicing serves to raise the percentage accounted for by producers' durable in the total flow of finished commodities and related services back to the approximate level at which they stand in the total output of finished commodities.

Another significant result of the comparison between output and flow of finished commodities is the difference in the variability of these two sets of quantities in time. Output shows almost uniformly a greater amplitude of variations. In current prices, this is true of each of the four groups of finished commodities distinguished; it is just as true of the rise from 1921 or 1922 to 1929 as of the decline from 1929 to 1932 or 1933; and it is also characteristic of the recessions of 1924 and 1927. The same difference, with one or two exceptions, holds for the comparison in terms of 1929 prices. The statistical source of the difference is obviously in the changes in inventories of producers and distributors; and the economic rationale is the difference in response to changing market conditions among producers, distributors and ultimate users.

2. *The Volume of Total Construction*

The basic data employed in arriving at the volume of total construction were those on the output and flow of construction materials. From these data we arrived, by successive steps, at the estimates of the volume of construction materials consumed, and on the basis of the latter, at the estimates of the volume of construction. The steps may be outlined as follows:

(a) Total output of construction materials, at producers' current values, was estimated from the data in the biennial *Census of Manufactures,* data of the Bureau of Mines on non-manufactured construction materials, and state and other data for intercensal years. This annual volume of output of construction materials was corrected for price changes with the help of the Bureau of Labor Statistics index of wholesale prices of building materials, thus providing an estimate of output in 1929 prices.

(b) To pass from the output of construction materials to actual consumption in the process of construction, adjustments were needed for exports and imports; for changes in stocks held by the various agencies in the field, beginning with the producers and ending with the construction enterprises themselves; and for successive additions for transportation charges and distributive margins. The first cor-

rection was based, as usual, on the data on exports and imports published by the Bureau of Foreign and Domestic Commerce. The corrections for distributive and transportation charges were again made on the basis of a comparison of the *Census of Manufactures* and *Mines and Quarries* in 1929 with the *Census of Distribution*; while the adjustments for changes in stocks were based on a specially compiled stock index. The adjustments were made from stage to stage: from manufacturers to wholesalers; from wholesalers to retailers; from retailers to construction units. While the detailed figures at these successive stages are possibly subject to an appreciable error, it was felt that only such a successive correction would yield the best estimate of the volume of construction materials actually consumed in the process of construction.

(c) To pass from the value of construction materials consumed to the value of total construction, we needed an estimate of the ratio of the cost of construction materials to the value of the final product. Such a ratio is provided for various types of construction by the *Census of Construction* for 1929. The available evidence, scanty as it is, indicates that within each type of construction work, and in terms of constant prices, the ratio of cost of construction materials to the final value of the product tends to vary but little. Therefore, the ratio was allowed to vary only with the shift in importance of various types of construction work, shifts which may be gathered approximately from other available estimates of the volume of construction. These estimates are restricted in area of coverage but show construction by type. The application of the resulting ratio yielded the estimate of the total volume of construction in 1929 prices.

(d) A composite construction cost index was prepared from various indexes of cost of construction, such as the Bureau of Public Roads index of highway construction costs, the Richey electric light and power index, the American Appraisal Co. index of cost of construction, the Tuttle factory construction cost index, and others. The indexes were weighted by the approximate weights of the corresponding types of construction, as revealed by the currently available indexes of volume of construction by type. The application of this composite cost index to the volume of construction in 1929 prices yielded the final estimate of the volume of total construction in current prices.

It is obvious from this brief description of our procedure that the resulting estimates of total volume of construction may be subject to error. The critical steps in the estimates are the evaluation of the volume of construction materials and the establishment of the ratio of the cost of construction materials to the total volume of construction. An error in either will be reflected in the final totals. That such a procedure was adopted may be explained by the lack of inclusive estimates in this field, especially prior to 1925.

It is therefore highly important to compare our global estimates with the most inclusive estimates of the total volume of construction, based upon direct information on various types of construction activity. Table 11 presents the detailed estimates of the Federal Employment Stabilization Board for the period 1925-32,[1] and compares the totals derived from these estimates with our totals based upon the consumption of construction materials.

From the totals derived from the figures of the Federal Employment Stabilization Board, converted into indexes, with the value for 1929 as 100, and compared with the indexes of our estimates, we obtain:

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*
F.E.S.B.	101.8	102.9	105.0	106.6	100.0	88.9	66.8	38.7
N.B.E.R.	97.6	99.7	103.4	110.7	100.0	82.9	62.0	38.0

On the whole, our estimates show a somewhat more rapid rise from 1925 to 1928 and decline to 1930, the movement after 1930 being about the same in both indexes.

Our estimates indicate a volume of total construction larger than the sum obtained by adding the diverse types as measured by the Federal Employment Stabilization Board, the excess varying from a peak of about $4 billion in 1928 to a trough of about $1 billion in 1932. The reasons for this difference appear to be:

(1) The Board's estimates of private construction, based on the Dodge figures with the addition of farm construction, do not allow for the fact that the Dodge reports in the past failed to cover contracts under $5,000, or alterations and remodelling. The total estimate for this item by the Dodge Company amounted to $1.5 billion in each of the two years 1928 and 1929 (see Leo Wolman, *Planning and Control of Public Works,* National Bureau of Economic Research, 1930, p. 107). While some portion of this allowance is covered by the estimates of farm construction and by the Board's inclusive totals for public utilities, a considerable residue probably still does not appear in the Board's estimates.

(2) A small amount of private educational construction is omitted; and there appears to be some shortage in the figures on public construction in 1927 and 1928, when these are compared with the Dr. Wolman's estimates (see p. 126).

(3) The estimates for construction work by public utilities may be somewhat short, in so far as the accounting of the public utilities may fail to impute to cost of construction the full share of overhead expenses incurred.

[1] The Board's preliminary figures for 1932 were revised by us in the light of recent data, in accordance with the procedure of the Board.

Table 11

Allocation of Total Construction by Type, 1925-1932
Current Prices
(*millions of dollars*)

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*
1. Residential	3,050	2,965	2,856	3,095	2,127	1,222	900	311
2. Commercial	968	1,022	1,036	982	1,031	684	345	136
3. Factories	363	523	417	565	606	285	129	48
4. Theatres, clubs, lodges, religious and memorial	386	385	393	311	224	188	129	47
5. Farms	470	470	473	463	463	367	258	125
6. Total private	5,237	5,365	5,175	5,416	4,451	2,746	1,761	667
7. Railroads	1,223	1,371	1,339	1,280	1,370	1,230	812	479
8. Electric power companies	884	823	844	813	906	968	654	322
9. Telephone companies	502	534	545	613	795	817	604	439
10. Electric railways	242	207	205	194	194	189	155	98
11. Sub-total	2,851	2,935	2,933	2,900	3,265	3,204	2,225	1,338
12. Pipe-line companies						515	469	165
13. Gas companies						226	167	96
14. Telegraph companies						73	37	21
15. Waterworks companies						44	25	15
16. Total railroads and public utilities						4,062	2,923	1,635
17. Estimated total railroads and public utilities[1]	3,615	3,722	3,719	3,677	4,140	4,062	2,923	1,635
18. Cities	1,283	1,302	1,482	1,422	1,339	1,495	1,271	872
19. Counties	778	676	885	829	556	709	355	35
20. States (excl. Federal aid)	411	404	438	502	576	706	770	610
21. Federal (incl. Federal aid, excl. D. C.)	245	230	240	270	305	390	510	580
22. Total public works	2,717	2,612	3,045	3,023	2,776	3,300	2,906	2,097
23. Total derived from above (6+17+22)	11,569	11,699	11,939	12,116	11,367	10,108	7,590	4,399
24. Volume of total construction based on consumption of construction materials	14,032	14,343	14,876	15,919	14,381	11,921	8,920	5,458
25. Unallocable construction not covered under line 23 (24—23)	2,463	2,644	2,937	3,803	3,014	1,813	1,330	1,059

[1]For the years 1925 through 1929 this line was estimated on the basis of the 1930 relationship of line 16 to line 11.

(4) Finally, our estimates cover minor repairs and alterations, and construction work by non-construction enterprises other than public utilities and public agencies. It is interesting to observe that in the four constructional occupations listed in the *Census of Occupations* for 1930, painters, carpenters, plumbers, and brick and stone masons, a considerable number for each occupation appear as attached to industries that are neither in the construction nor in the public utility or public service groups.

Nevertheless, our estimates may still exaggerate the volume of total construction; and it is quite obvious that further, thorough analysis and reconciliation of the two types of construction estimates is necessary. This is especially important, since our estimates of total construction show a rise from 1921 to 1929 that is considerably milder than that indicated in such less inclusive estimates as the Federal Reserve Board's index of construction contracts awarded (based on Dodge data). Our estimates of the volume of construction are presented as first approximations, to be used jointly with other data in the field, and subject to possible revision in the final report of the study.

3. *Business Inventories*

Business inventories comprise the stocks of all finished commodities in the hands of their producers and distributors, and of unfinished commodities in the hands of their producers, distributors and industrial consumers. They do not include the stocks of finished durable commodities in the hands of their consumers, whether these be households or enterprises; nor do they include stocks of non-durable finished commodities, such as foods and clothing, in the hands of ultimate consumers, with the exception of farmers' holdings of their own products for eventual consumption.

The essential data relating to inventories are those on corporate inventories, reported by all corporations (with the exception of a small number, whose business constitutes about three per cent of the total corporate business of the country) to the Income Tax Bureau; and data on farmers'

harvestings and marketings, and occasionally stocks, which make it possible to measure the approximate volume of stocks of commodities held by farmers. The basic steps in arriving at the estimates of business inventories were:

(a) For all branches of business dominated by corporations, i.e., mining, manufacturing and public utilities, the annual data of *Statistics of Income* were used, and raised to cover the total by the ratio of the total value of product to the corporate value. For the service group, only corporate inventories were estimated, taken directly from *Statistics of Income.* For recent years not yet reported by *Statistics of Income,* extrapolating indexes were used, based on samples of large corporations. The ratio of the inventories to gross income in these samples was used to extrapolate a similar ratio for the corresponding industries. For years prior to 1923, inventories were estimated from a regression line of inventories on gross income, fitted to the data for the years covered by *Statistics of Income.*

(b) For branches of business not dominated by corporations, such as retail and wholesale trade, farming, and construction, other methods were employed. For farming, as indicated above, series on harvestings, monthly marketings, and the Census data on stocks in the hands of farmers were used. For retail and wholesale trade, inventories at the end of the year 1929 were given in the *Census of Distribution.* The ratio of inventories to sales was extrapolated for other years with the help of various interpolating indexes, such as that provided by the Federal Reserve Board's data on stocks and sales by department stores, data on corporate inventories and sales in the field of trade, similar data, but for more detailed subdivisions, in the corporate sample studied by Dr. Ralph C. Epstein. The volume of sales was itself estimated on the basis of the domestic output of products entering retail and wholesale trade. For construction enterprises, stocks for 1929 were estimated from corporate inventories, on the basis of a special breakdown of the Census data on contract construction into corporate and non-corporate; and for other years these total stocks for 1929 were extrapolated on the basis of a changing ratio of stocks to total cost of construction materials received during the year.

(c) All these operations under (a) and (b) resulted in estimates of the total volume of business inventories, by a number of minor divisions, in terms of current valuations. The correction for changes in these valuations was made with the help of the Bureau of Labor Statistics wholesale price indexes, and with due allowance in each case for the approximate age of the stocks. The assumption throughout was that inventories were being reported at cost or market, whichever lower. The corresponding application of the price indexes yielded the second set of estimates: business inventories in 1929 prices.

(d) Net changes in inventories in 1929 prices were obtained as successive differences of the estimates of inventories at the end of each year, in terms of 1929 prices. To obtain changes in inventories in current prices, the net changes in 1929 prices were multiplied by corresponding price indexes.

(e) The estimation of inventories of finished commodities (as distinct from inventories of all commodities, finished and unfinished) in the hands of distributors followed essentially the same procedure. The basic figures were derived for 1929 from the *Census of Distribution,* and estimated for other years with the help of indexes similar to those mentioned under (b) above. The correction of these inventories for price changes followed lines similar to those described under (c) and (d).

As indicated repeatedly, the final estimates of business inventories do not cover all the commodity stocks that should be taken into consideration in measuring gross capital formation. These estimates exclude stocks of unfinished and finished non-durable commodities in the hands of ultimate consumers and non-business agencies, and omit the business inventories of unincorporated establishments in the field of service. But even these incomplete estimates show a strikingly large figure for the total of business inventories for the country. The average volume for the post-War period as a whole is presented in Table 12. The classification, in this table, of inventories into perishable, semi-durable and durable is clear in the case of inventories of finished commodities. In the case of unfinished commodities, the characteristics of the preponderant eventual destined use form the basis of the classification. For example, stocks of raw cotton are classified under the semi-durable group, since the bulk of cotton is used in the production of clothing and attire.

Table 12

Volume of Business Inventories and Ratio of Business Inventories to Flow of Finished Commodities

1929 Prices

Commodity groups	Business inventories end of year: Average volume for 1918-32 (*millions of dollars*)	Business inventories end of year: Per cent of total	Ratio of business inventories (average for the year) to flow of finished commodities and construction Average for 1919-32
1. Perishable	14,786	47.1	0.656
2. Semi-durable	5,835	18.6	0.658
3. Durable (including construction materials)	10,782	34.3	0.481
4. Total	31,404	100.0	0.580

An interesting comparison can be made between business inventories and the flow of commodities, its rationale being

the fact that business inventories are held largely in order to facilitate the eventual flow of the finished products. We can accordingly compute the ratio of business inventories held during the year (average of end-of-year and beginning-of-year inventories) to the value of the flow of finished commodities which these inventories, together with other factors of production, help to bring about. The averages of these annual ratios for 1919-32 are given in the last column of Table 12.

For the total of finished commodities and related services, business inventories amount to slightly less than six-tenths of the annual flow. But in the case of non-durable commodities the ratio runs at about 0.66, while in the case of durable commodities the ratio is appreciably lower. This difference in the stock burden is a matter of common knowledge, which the estimates above express with greater precision.

Dr. Kuznets is no newcomer to the readers of the National Bureau BULLETIN. *As a member of the staff of the National Bureau he is in charge of its studies of the amount and distribution of national income, and it was under his direction that the recently-issued estimates of national income, 1919-32, were made by the United States Department of Commerce with the cooperation of the National Bureau of Economic Research. The results of that study were presented in convenient summary form in* BULLETIN 49. *Dr. Kuznets is also the author of what is probably the most thorough study of the seasonal factor in business:* SEASONAL VARIATIONS IN INDUSTRY AND TRADE (*National Bureau of Economic Research, 1932*).

As indicated on the title page, the present study of gross capital formation was undertaken by the National Bureau at the request of a special Committee on Credit and Banking of the Division of Industry and Trade of the Social Science Research Council. Dr. David Friday is Chairman of the Committee on Credit and Banking and Dr. Meredith B. Givens is Secretary.

At the second stage of the credit and banking phase of its research in Industry and Trade, the Council proposes further studies of the financing of capital expansion and contraction during this same period. The first project at this second stage, a broad inquiry into the financing of real property, is soon to be undertaken by the National Bureau.

HUGH FRAYNE

The National Bureau regrets sincerely to record the death of Hugh Frayne during the summer. He had been a member of the Board of Directors, representing the American Federation of Labor, since February 1923.

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

OSWALD W. KNAUTH, *Chairman* — GEORGE SOULE, *Vice-President*
JOSEPH H. WILLITS, *President* — SHEPARD MORGAN, *Treasurer*
CHARLES A. BLISS, *Executive Secretary*

Research Staff

WESLEY C. MITCHELL, *Director*
ARTHUR F. BURNS — F. R. MACAULAY
SIMON KUZNETS — FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, *Associate*

Directors at large

OSWALD W. KNAUTH — ELWOOD MEAD
H. W. LAIDLER — SHEPARD MORGAN
L. C. MARSHALL — GEORGE SOULE
GEORGE O. MAY — N. I. STONE

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
ARCH W. SHAW, *National Publishers Association*
ROBERT B. WOLF, *American Engineering Council*

THE BULLETIN

Subscribers receive in *Bulletin 52* preliminary findings of one of the major research projects being conducted at the National Bureau. Although the wealth of material available has resulted in a report considerably larger than that usually published in the *Bulletin,* making necessary an increase in the price of single copies to fifty cents, subscribers may expect another issue before the end of the year. In this last issue of the year, Dr. Mills will discuss price and production changes in American manufacturing industries during depression and recovery. Certain results of the 1933 Census of Manufactures, now being released, will be analyzed for the light they throw on this problem.

REVIEWS

Production Trends in the U. S. since 1870, by Arthur F. Burns ($3.50)

"At a time when the quantitative attack upon economic theory is marked by a bewildering mass of superficial and misleading investigations, it is a refreshing experience to examine a thoroughly workmanlike job such as the book by Professor Arthur F. Burns. Without necessarily endorsing all the methods or accepting all the findings of the book, the reviewer can speak with the highest enthusiasm of the work as a whole; and, without attempting to determine

with finality its place in the literature of economic statistics, one can heartily commend it to all thoughtful students as an outstanding contribution in the field of economic measurement. . . The reviewer closes the book with a feeling of profound satisfaction such as he rarely experiences in reading current contributions to quantitative economics."—W. L. Crum, *Quarterly Journal of Economics,* August 1934

Strategic Factors in Business Cycles, by John Maurice Clark ($1.50)

"Clark's book offers a most important contribution to the analysis and interpretation of cyclical movements. It substantiates once more the contention that no quantitative analysis is possible without a preliminary clarification of the data by the use of theoretical concepts and relationships; on the other hand, it shows that neither the working hypotheses underlying our thought nor its conclusions can be verified by "facts." Empirical evidence may suggest that certain conclusions are plausible or possible while others are inconsistent with reality. More can scarcely be expected from empirical observation in the economic realm where complex and inter-related short and long time fluctuations and secular trends lend the facts a peculiar aura of ambiguity. The serviceability of economic theory is not denied thereby; if it begins with correct assumptions and proceeds logically to conclusions compatible with facts it is just as effective as science is in the study of nature."—Emil Lederer, *Social Research,* May 1934

German Business Cycles, 1924-1933, by Carl T. Schmidt ($2.50)

"The author . . . has rendered an important service to students by providing, within the confines of some 280 pages, a summary of the salient factors which have affected the German economy since the Treaty of Versailles and the currency inflation of 1921-23. The main contributions of the study are an application of the technique of statistical analysis of representative time series as developed at the National Bureau of Economic Research. The evidence presented supports the view that most aspects of German industrial production, prices and finance passed through two cycles during the period 1924-32; the first of these cycles was approximately delimited by the dates December, 1923, and March, 1926, while the second began approximately in April, 1926 and continued until the late summer of 1932—one of the longest German cycles on record."—*Journal of the Royal Statistical Society,* Part IV, 1934

FORTHCOMING VOLUMES

INDUSTRIAL PROFITS in the UNITED STATES

RALPH C. EPSTEIN

Professor of Economics, University of Buffalo

Preliminary Note by Wesley C. Mitchell

A Publication of the
NATIONAL BUREAU OF ECONOMIC RESEARCH
in Cooperation with the
COMMITTEE ON RECENT ECONOMIC CHANGES

672 pp., 123 tables, 69 charts $5.00

MECHANIZATION IN INDUSTRY

by

HARRY JEROME

Professor of Economics, University of Wisconsin

Introduction by F. C. Mills

400 pp., 55 tables, 5 charts $3.50

Industrial Profits will be published December 1, and *Mechanization in Industry* about the first of the year.

Orders for both volumes are now being taken. Contributing members will receive complimentary copies of these volumes before they are placed on public sale.

National Bureau of Economic Research

BULLETIN 53

DECEMBER 22, 1934

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Changes in Prices, Manufacturing Costs and Industrial Productivity, 1929-1934

FREDERICK C. MILLS

Copyright 1934, National Bureau of Economic Research, Inc.

Recession and Recovery in Prices and Earnings

EVERY major business recession disrupts existing ties among the elements of the economic system. This process of disruption, it is true, may be preceded and paralleled by correctional changes—movements tending to lessen strains developing during the phase of business expansion. But in a serious decline the correctional movements pass into a destructive stage that may outlast and outweigh the period of amelioration. In this stage such balance as may have existed between the incomes of consumers and the aggregate values of goods offered for sale is dislocated. Established relations between production costs and final selling prices are radically altered. The host of price relations that condition the movements of goods along the channels of trade are subject to shifting and distortion. Recovery, following such a general tumbling of values, may be effected through adaptation to altered relations, through restoration of earlier relations, or through some combination of these two modes of adjustment.[1]

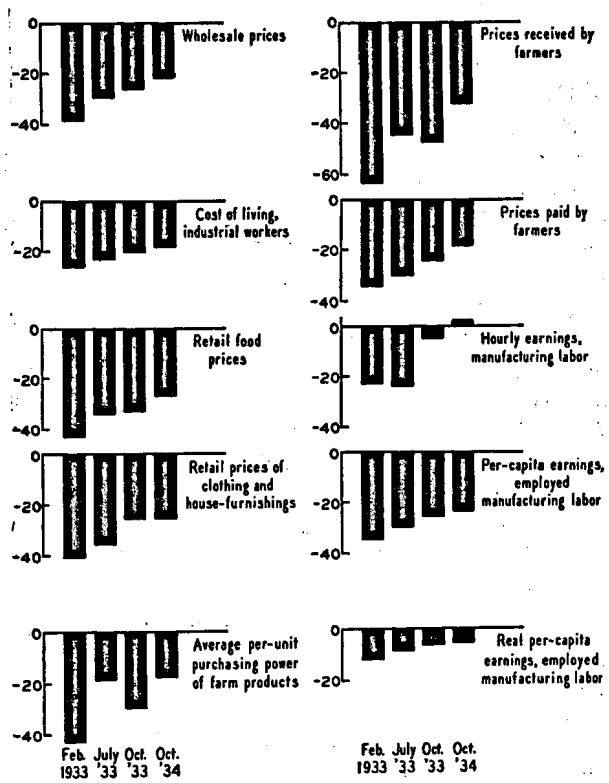
The wide inequalities of price changes occurring during the last five years have been, at once, manifestations of profound disturbances in the physical conditions of production and distribution and obstacles to the resumption of normal activity. The character and significance of these disturbances have been discussed in earlier *Bulletins* of this series.[2] The price scene is a rapidly changing one, however, and current price relations are of continuing in-

Figure 1

GRAPHIC PRESENTATION OF CHANGES IN VARIOUS ELEMENTS OF THE PRICE STRUCTURE OF THE UNITED STATES, AND IN RELATED FACTORS

JULY, 1929, TO OCTOBER, 1934

(Changes are measured as percentage deviations from the level of July, 1929)



[1] Space limitations prevent an adequate statement of the relation of the price and other 'distortions' of recession and depression to the system in existence prior to the recession. This pre-existing system may have been far removed indeed from one of perfect equilibrium. The fact that recession occurred is evidence that correctional changes were required. It is a fair assumption, however, that the distortional effects of the most recent recession were dominant between, let us say, 1930 and the winter of 1932-33, and that the extreme differences between relative prices which prevailed in February, 1933, represented barriers to the movement of goods in customary volume.

[2] *No. 40,* November 22, 1930; *No. 42,* December 23, 1931; *No. 45,* February 20, 1933; *No. 48,* October 31, 1933.

Table 1

INDEX NUMBERS DEFINING CHANGES IN VARIOUS ELEMENTS OF THE PRICE STRUCTURE OF THE UNITED STATES, AND IN RELATED FACTORS, JULY, 1929, TO OCTOBER, 1934

Economic element[1]	*July 1929*	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
Wholesale prices	100	62	71	74	79
Cost of living of industrial workers	100	74	77	80	82
Retail food prices	100	57	66	67	73
Retail prices of clothing and house-furnishings	100*	59	64	74	74
Prices received by farmers	100	37	56	53	68
Prices paid by farmers	100	66	70	76	82
Hourly earnings, manufacturing labor	100	77	76	95	102**
Per capita earnings, employed manufacturing labor	100	65	70	74	76
Average per-unit purchasing power of farm products[2]	100	57	81	70	82
Real per capita earnings, employed manufacturing labor[3]	100	88	91	93	94

*October, 1929
**September, 1934
[1] Sources and descriptions of these index numbers appear in the Appendix Note.
[2] Percentage relation of index of average prices received by farmers to index of average prices paid by farmers for commodities used in production and in family maintenance.
[3] Percentage relation of index of average weekly earnings of manufacturing employees to index of cost of living of industrial workers.

terest. These relations may be viewed against the background of changes which have occurred since July, 1929. Table 1 and Figure I provide materials for such a survey.

Here we have a graphic record of the price aspects of the recession which culminated in the winter of 1932-33, and of the subsequent recovery. The picture is an impressive one. Without exception the series presented were higher in October, 1934, than in October, 1933,[5] and substantially higher than at the low point of February, 1933. The upward climb was not unbroken, but the diagram gives a faithful impression of the cumulative effects of price recovery over this period. All major elements of the price system have felt the lift in values that has occurred during the last twenty months.[6]

The two final entries in the table and the corresponding figures in the chart relate to 'real values', in that account is taken of the effects of changing prices. The per-unit purchasing power of farm products, which had fallen 43 per cent during the recession, recovered the major part of this loss in the succeeding twenty months. In October, 1934, this index was 18 per cent lower than in July, 1929. The real earnings, per capita, of employed manufacturing labor advanced from a level 12 per cent below the 1929 base, in February, 1933, to a level only six per cent below that base, in October, 1934. The gain in the average dollar income of manufacturing workers was more than sufficient to offset rising living costs. The net advance over a period of twenty months amounted to seven per cent, a notable gain in real earnings, achieved in the face of reductions in the hours of labor. Hourly earnings advanced materially, of course, the chief gain being made between July and October, 1933.

Shifts in the Structure of Wholesale Prices

We pass now to certain of the changes occurring within the field of wholesale prices. The entries in Table 2, which are graphically portrayed in Figure II, define the relevant movements.

These measures show changes in the real values, per unit, of the commodities in the groups named. That is, the actual price index numbers of these groups have been divided by a general index of wholesale prices. The measurements thus define deviations from the general price level, with relations prevailing prior to the recession taken as the standard of reference.

The major differences developing between July, 1929, and February, 1933, are clearly revealed in the graphic presentation.[7] The recession brought advances in the real

[5] Retail prices of clothing and house-furnishings were only fractionally higher in October, 1934. The check to the advance of these prices, after the very sharp climb in the summer and fall of 1933, is worthy of note.

[6] We are here concerned with the manifestations and consequences of the price advance that may be dated from February, 1933, rather than with the causal factors in that advance. Escape from some of the fears and uncertainties of the interregnum between administrations, suspension of specie payments, buying and building up of inventories in expectation of inflation and of higher prices under the codes, the quickening influence of reviving domestic trade, and, more recently, crop shortages, all contributed at different times and in varying degree to the upward movement.

[7] These price differences represent, in some degree, adjustments to varying changes in producing costs. Among manufactured

Table 2

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE, IN THE UNITED STATES, JULY, 1929 TO OCTOBER, 1934

A. MAJOR COMMODITY GROUPS[1]

Commodity group	*Index numbers of purchasing power, per unit*				
	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
Raw materials	100	82	91	87	92
Manufactured goods	100	111	106	108	104
Foods	100	81	88	82	92
Non-foods	100	112	108	111	105
Products of American farms, raw	100	64	82	73	85
All other products	100	110	105	108	104
Producers' goods	100	96	100	98	99
Consumers' goods	100	104	100	102	101

B. CLASSES OF PRODUCERS' AND OF CONSUMERS' GOODS[1]

Classes of producers' goods	*Index numbers of purchasing power, per unit*				
	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
All producers' goods	100	96	100	98	99
Raw	100	80	89	87	92
Processed	100	116	111	112	107
Intended for human consumption	100	74	89	85	90
Intended for use in capital equipment	100	118	108	107	104
Intended for use in building materials	100	123	116	118	109
Producers' goods intended for human consumption	100	74	89	85	90
Foods	100	65	82	71	88
Non-foods	100	83	96	97	92

Classes of consumers' goods	*Index numbers of purchasing power, per unit*				
	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
All consumers' goods	100	104	100	102	101
Raw	100	90	96	90	94
Processed	100	108	102	105	103
Consumers' goods, processed	100	108	102	105	103
Foods	100	96	92	90	97
Non-foods	100	119	110	118	109

[1] The price index numbers from which the above measurements of per-unit purchasing power have been derived are given in Appendix Table A. They are described in the Appendix Note.

per-unit worth of manufactured goods, declines in the real per-unit worth of raw materials, advances among non-foods, declines among foods, advances among consumers' goods, and declines among producers' goods.[6] Conspicuous is the difference developing between the average per-unit values of raw farm products and of all other goods. Notable, too, are the differences developing among different classes of producers' and of consumers' goods, and the exceptionally high values of building materials and of goods for use in capital equipment. The strikingly wide price margin prevailing in February, 1933, between processed consumers' goods and producers' goods intended for human consumption is an indication of the relatively high per-unit cost of fabrication at the low point of depression. The significance of such disparities has been suggested above. Each of these major differences represents a host of individual cleavages, breaks in a multitude of producing and trading relations. The net result is to check normal activity until readjustment to new relations can be effected,

goods the reduction of costs is almost inevitably slower than among raw materials, because of the greater importance of fixed charges in the production of fabricated products. Yet with respect to trading relations between major producing groups, such as raw-material producers and manufacturing groups, price differences created over a short period are true disparities, tending to alter the basis of trade and to lessen the volume of inter-group trade.

[6] Producers' goods include capital equipment, building materials and all those raw and partly processed products not ready for use in the satisfaction of ultimate human wants. Consumers' goods include all commodities ready for consumption or use by the final consumers.

or until working approximations to old relations may be established.

If we assume that some degree of return toward pre-recession relations is conducive to a restoration of economic activity, then we must conclude from the record that the price movements of the twenty months from February, 1933, to October, 1934, have been salutary. Price cleavages among the major commodity groups have been reduced. The high real values of building materials and of goods for capital equipment have been somewhat lowered, as a result of the advance in other prices, although they remain out of line with commodities in general. The high fabricational margin between producers' goods intended for ultimate human consumption and finished consumers' goods has been narrowed. The last twelve months, in particular, have brought notable gains in all these cases. This improvement is significantly in contrast to the definitely retrogressive tendencies prevailing from July to October, 1933. The general enforcement of new industrial codes during the third quarter of 1933, combined with a swing back from the sharp advance of the preceding quarter, served to widen relative price differences, raising costs which were already high and depressing prices already low. But recent movements have taken a more favorable turn. Crop shortage, on the one hand, an apparent lessening of the pressure toward higher prices under industrial codes, on the other, have been factors in these changes. Although some important discrepancies persist, definite progress has been made toward the establishment of price relations closer to those prevailing prior to the economic blizzard of 1929. These price movements do not, of course, constitute recovery, but it is fair to assume that they clear the ground for renewed physical activity.

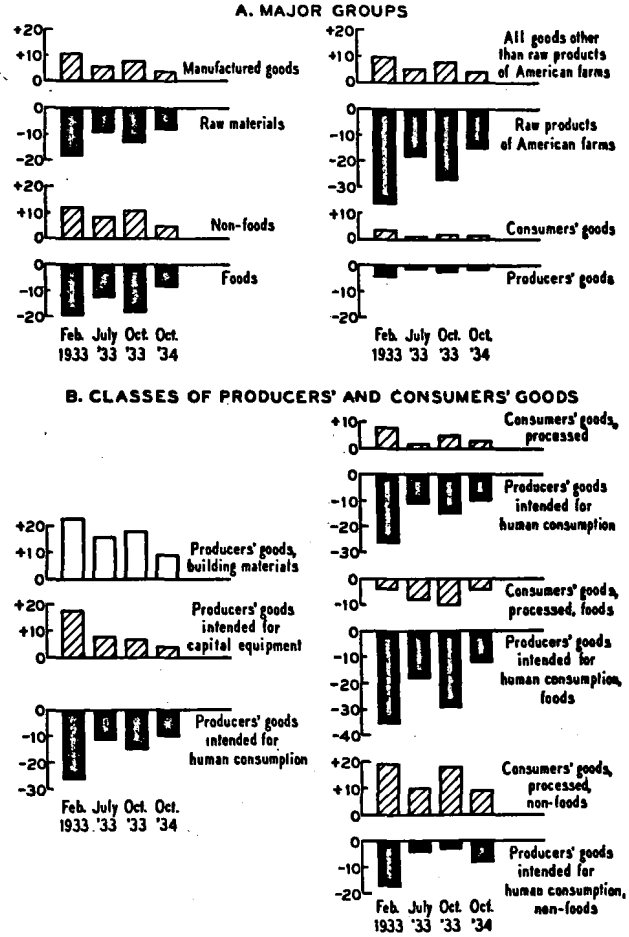
In using July, 1929, as the standard of comparison in this survey, we should not assume that the relations then prevailing constituted a 'normal' condition. That month is a convenient base of reference. It provides a standard against which the magnitude of later changes may be measured, but it does not provide a criterion of what is economically or socially desirable. The reader may find it of interest to compare the shifts in price relations defined in Table 2 with changes measured against a broader base. Table B, in the Appendix, contains measurements corresponding to those in Table 2, in the text, but on a base secured by averaging measurements for the years 1927, 1928 and 1929.

Figure II

GRAPHIC PRESENTATION OF CHANGES IN THE REAL VALUES, PER UNIT, OF COMMODITIES IN SELECTED GROUPS

JULY, 1929, TO OCTOBER, 1934

(Changes are measured as percentage deviations from July, 1929, parity with general wholesale prices)



Production and Price Movements and the Aggregate Purchasing Power of Producing Groups

This conspectus of recent price history has shown how serious were the breaks resulting from the first impact of the recession, and has revealed the extent of the readjustment already effected. To secure a general picture of the economic shifts of recession and recovery, we must supplement this account with a brief survey of changes occurring in the volume of production, the average price of products or services and the gross income of certain major producing groups in the United States.

The income estimates given below for producers of farm products, raw mineral products and manufactured products, and for industries engaged in railroad transportation and in construction, relate to gross income, without any reduction for cost of materials or for other production costs. They are highly significant, however, in defining changes in the aggregate purchasing power of producing groups in each of these five fields. Perhaps the most effective comparison among these industrial groups is that which may be made with reference to Figure III. Here are shown production changes, price changes and changes in gross income between

Table 3

INDEX NUMBERS OF PRODUCTION, PRICES AND GROSS INCOME, 1929-1934

SELECTED INDUSTRIES OF THE UNITED STATES[1]

(*1929=100*)

Year	Farm	Raw mineral	Manufacturing	Construction	Railroad freight transportation
			Production		
1929	100	100	100	100	100
1930	98	89	87	90	86
1931	103	75	75	76	69
1932	95	62	60	49	52
1933	92	66	67	36	56
*1934**	87	71	70	38	60
			Average Prices		
1929	100	100	100	100	100
1930	86	93	91	96	99
1931	60	81	78	85	98
1932	45	78	70	75	97
1933	48	78	72	82	93
*1934**	61	88	80	87	92
			Gross Income		
1929	100	100	100	100	100
1930	81	81	79	87	85
1931	60	53	58	65	67
1932	42	42	42	37	51
1933	44[2]	43	48	29	52
*1934**	53[2]	52	58	33	55

*Based on first ten months of 1934, except as stated in the Appendix Note.

[1] This classification refers to individual products. The indexes derived, therefore, may differ somewhat from groupings in which an entire enterprise is treated as a whole, without regard to the fact that it may be engaged in several diverse fields of production.

Index numbers measuring changes in production, average price and gross income in a given industrial group should be self-consistent, in that the gross income index for a given year should be capable of derivation, by multiplication, from the two other measurements. For certain of the groups named above these three sets of index numbers have been independently derived, and are somewhat inconsistent. Reasons for this are found in differences of weighting, coverage, and procedures used in averaging the basic measurements. As they stand, however, the measurements portray with reasonable accuracy the major changes occurring over the period covered. Detailed descriptions of the several index numbers are given in the Appendix.

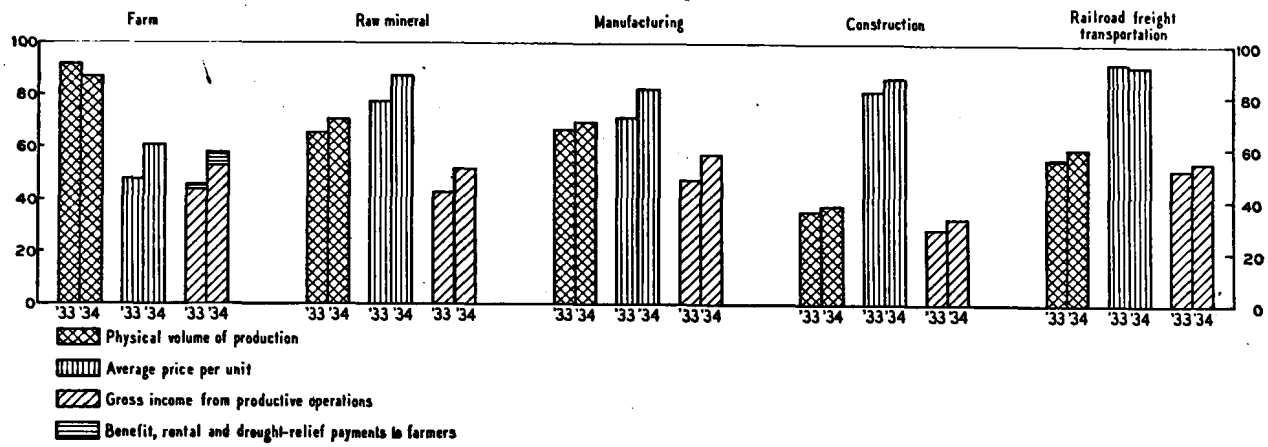
[2] These index numbers would be 46, for 1933, and 58, for 1934, if in the gross income of farmers we include benefit, rental and drought-relief payments.

1929 and 1933, between 1929 and 1934, and between 1933 and 1934. (It should be noted that the 1934 entries are estimates based upon the latest available records, which cover, in most instances, the first ten months of the year.)

Measurements of production changes from 1929 to 1933 reveal wide differences among these groups. The output of farm products remained high, being, in 1933, only eight per cent below the 1929 average. At the other extreme we find a drop of 64 per cent in the volume of construction and a decline of 44 per cent in the volume of railroad freight transportation. In the field of prices the story is different. As compared with farm prices 52 per cent below the 1929 level, the average per-unit cost in construction industries in 1933 stood only 18 per cent below the same standard, and the average per-unit cost of railroad transportation services was only seven per cent below the 1929 level. The 1933 gross income figures for the five groups show no such wide variation. With the exception of construction industries, for which income was 71 per cent below the 1929 level, the industrial groups represented are fairly close together. Gross income was reduced for these other groups by amounts ranging from 48 to 57 per cent. This result was brought about in agricultural industries through the reduction of prices and the maintenance of production, in railroad transportation (as in construction) through the maintenance of prices and the reduction of production. Raw mineral producers and manufacturing producers suffered declines in both production and prices, but production decreases exceeded price declines.

From 1933 to 1934 production increased for all groups except farmers; for all groups except railroads prices increased; for all groups without exception gross income ad-

Figure III
INDEX NUMBERS OF PRODUCTION, AVERAGE PRICES AND GROSS INCOME
SELECTED INDUSTRIES OF THE UNITED STATES
(1933 and 1934 as percentages of 1929)



vanced. These advances, as estimated from data now available, ranged from six per cent for railroads to 26 per cent for agricultural industries (the latter including benefit, rental and drought-relief payments).

The month-by-month record of changes in the volume of production and in the average prices prevailing over broad industrial areas is sometimes less revealing than are the annual figures. The annual aggregates of production and gross income, and the annual averages of prices for the five major groups here represented give unmistakable evidence of substantial progress from 1933 to 1934.

Production and Price Changes in Manufacturing Industries

From these general records of industrial changes we proceed to a more detailed consideration of the fortunes of manufacturing industries during depression and recovery. Some of the sharpest economic issues of the crisis and depression have centered about production and price policies in manufacturing industries. Here the difficulties due to the interaction of diverse forces have been as tough and as complex as any raised by the depression. Problems of production control, of price making, of readjusting capital values to changed standards have complicated the special difficulties of code making and code application that arose under the National Recovery Act. The trading relations of manufacturing industries with other major producing groups have been demoralized by the price inequalities developing during the recession, and persisting thereafter. In following the fortunes of these industries during depression and recovery we shall be dealing with matters lying near the heart of our current troubles.

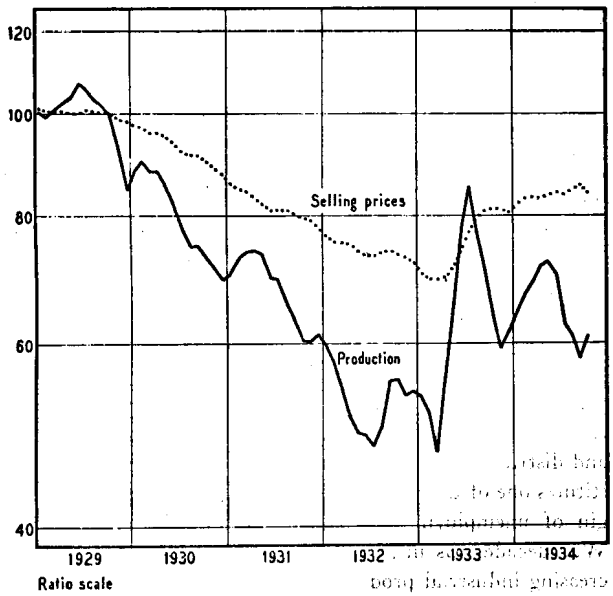
This survey of production and cost changes in manufacturing industries is the more interesting because of the special character of the industrial structure of the United States. This structure represents a unique combination of raw-material producing and manufacturing industries. During the strains of cyclical fluctuations these two important elements of the economy react in distinctive ways to the forces of recession and recovery. Where one type of industry predominates some homogeneity of response to the forces of business cycles is to be expected. But in an economy which combines two major elements, with distinctive modes of behavior, special strains may be expected during a cycle, particularly during those phases which involve substantial readjustment over fairly short periods. Internal schisms leading to both economic and political friction are more likely to develop under these conditions, and the economic situation is likely to be more confused and uncertain than where the impact of economic forces is more uniform.

Precisely such a situation developed in the United States during the most recent recession. Indeed, the fortunes of raw-material producers and of manufacturing producers had followed notably divergent courses during earlier periods, including many years when the dominant tone of American economic life was one of prosperity. But during the years following the initiation of the 1929 recession major disparities appeared among the records which define the price, production and employment changes in the various elements of the national economy. These elements, never in perfect step even during eras of general prosperity, became badly tangled during the violent disturbances of the most recent recession. Elements of varying flexibility and of varying sensitivity, exposed to major shocks, respond in diverse ways. The national economy of the United States, containing more heterogeneous elements, perhaps, than any other major national economic system, has suffered especially severe internal distortion under the strains of readjustment.

Some indication of the magnitude of those strains has been given in preceding tables and charts, depicting the divergent movements of various economic elements under the impact of recession. One major element is composed of the group of manufacturing industries. Behaving in distinctive ways during recession and depression, facing particularly difficult obstacles in the task of readjustment, containing within itself subordinate groups of widely different character, this element of the national economy is worthy of somewhat more detailed study.

Evidence of the strains of readjustment in this group is afforded by the records of month-to-month changes in the volume of manufacturing production and in the average selling prices of manufactured products. These changes, for manufacturing industries in the aggregate, are shown

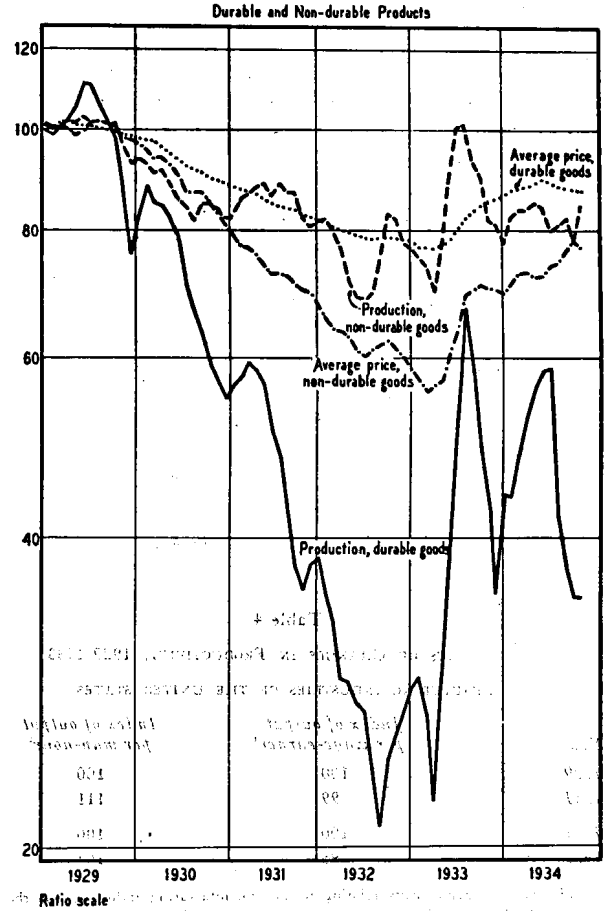
Figure IV
CHANGES IN PRICES AND PRODUCTION
MANUFACTURING INDUSTRIES OF THE UNITED STATES
1929 - 1934



graphically in Figure IV. The volume of production, it will be noted, dropped from 1929 to 1932 in a series of precipitous declines interrupted by sporadic recoveries. The net decline from the high point in June, 1929, to the low point in July, 1932, amounted to 55 per cent. After the attainment of this low and the erratic swings of the eight months following came the upward surge of the spring recovery in 1933, followed by a sharp decline in the fall, an upswing in the spring of 1934, a subsequent decline in the summer months, and the recent advance. In contrast to these sporadic and violent changes is the steady although relatively severe decline in selling prices from July, 1929, to February, 1933, and the fairly steady advance since then. As we have already noted, the net decline in volume of manufacturing production was considerably greater than the net decline in average selling prices. Declining sales and reduced production were necessary accompaniments of the retarded drop in the selling prices of manufactured goods.

These aggregate and average figures for manufacturing industries conceal many divergent movements. Striking examples are afforded by the series plotted in Figure V. Here are depicted the changes occurring in the aggregate output

Figure V
CHANGES IN PRICES AND PRODUCTION
MANUFACTURING INDUSTRIES OF THE UNITED STATES
1929 - 1934
Durable and Non-durable Products



and in the average prices of durable and of non-durable products of manufacture. The most severe decline in production occurred among industries producing durable goods. Here we have a drop to a level 76 per cent below the 1929 average, as contrasted with a decline of only 31 per cent in the production of non-durable manufactured goods. Just the reverse of these relations is found among the corresponding price series. Durable goods remained relatively high in price, while non-durable goods, for which produc-

tion was relatively well sustained, suffered a much more severe price decline. These relationships are, of course, to be expected. When production is maintained during a period of recession, prices necessarily suffer. On the other hand the maintenance of prices when demand is declining usually entails a sharp reduction of output.

CHANGES IN INDUSTRIAL PRODUCTIVITY

For a better understanding of the currents of change affecting manufacturing industries during this period of drastic recession and of recovery, we should trace alterations in manufacturing productivity and in production costs. Available records permit these movements to be followed only through 1933, for most manufacturing industries. We shall concern ourselves first with changes in industrial productivity in manufacturing industries. For convenience, productivity changes may be measured in terms of output per wage-earner or of output per man-hour. Actually, of course, the factors affecting productivity are many, including equipment, elements of organization and administrative efficiency, as well as the industrial skill and constancy of application of members of the working force.

The decade 1919-1929 witnessed one of the greatest advances ever recorded in industrial productivity in American manufacturing industries. Output per worker employed increased no less than 41 per cent. The significance of this figure may be brought home more vividly if we realize that it means that in 1929, 71 men, working with the improved equipment then available, could produce the volume of goods for which 100 men were required in 1919. What have the depression years added to this striking advance? The answer to this question is suggested by the figures in Table 4.

Table 4

MEASUREMENTS OF CHANGES IN PRODUCTIVITY, 1929-1933

MANUFACTURING INDUSTRIES OF THE UNITED STATES

Year	*Index of output per wage-earner*[1]	*Index of output per man-hour*[2]
1929	100	100
1931	99	111
1931	100	100
1933	95	104

[1] Median of measurements relating to 112 manufacturing industries for the years 1929-31, and to 60 manufacturing industries for the years 1931-33 (based upon data compiled by the United States Bureau of the Census).

[2] Median of measurements relating to 33 manufacturing industries for the years 1929-31, and to 25 manufacturing industries for the years 1931-33 (based upon data compiled by the United States Bureau of the Census, United States Bureau of Labor Statistics, and the National Industrial Conference Board). These indexes differ somewhat from those appearing in *Bulletin No. 51* of this series because, for the present purpose, use was made of unweighted medians rather than of weighted averages, and because more recent data have been used in deriving the present measurements.

From 1929 to 1931 output per wage-earner employed remained practically constant; from 1931 to 1933 it declined by about five per cent. Here is a notable change from the steady advance recorded during the pre-recession decade. However, in interpreting these figures we must note one important industrial change in recent years. During this recession, particularly in its later stages, the practice of reducing hours in order to retain men in employment was widely adopted. This would, of course, involve a reduction in output per wage-earner employed, even though no change had occurred in the actual productivity of labor.

More significant conclusions concerning recent changes in productivity may be drawn if we measure change in output with reference to a man-hour unit. Distortion due to changing hours of work may be thus avoided. On this basis we find an advance of about 11 per cent in industrial productivity between 1929 and 1931, and a gain of four per cent between 1931 and 1933. These figures are in accordance with our expectations. Depression brings a tightening up of efficiency and a systematic attempt to eliminate sources of waste. Industrial productivity almost invariably increases during such a period of economic strain.

Other records, relating to a smaller sample of manufacturing industries, indicate that this movement toward higher productivity has continued during the present year, after a drop during the business decline of last fall. It is clear that the advances in productivity during the decade 1919-1929 did not exhaust the potentialities of improvement in our industrial system. Whether we experience prosperity or depression we may expect a continued gain in industrial productivity. In prosperity the chief facilitating agency is probably improved equipment. In depression, this factor is supplemented by the pressure to eliminate waste and to increase efficiency. How to adapt productive practices and distributive procedures to this steady improvement constitutes one of the major problems today. The growing margin of unemployment which characterized the first post-War decade was in some degree a resultant of rapidly-increasing industrial productivity. Recent advances intensify this problem. Until we solve it, we shall not enjoy a standard of living equal to the promise of our productive resources.

SELLING PRICES AND PRODUCTION COSTS IN MANUFACTURING INDUSTRIES

We should expect notable changes in production costs to have accompanied these variations in industrial productivity. The actual course of events, however, has been clouded by the many complications introduced by the enforcement of the National Recovery Act. Working conditions have been modified, wage rates have been altered, and pricing policies have been substantially changed. All of these factors find expression in the records of changing pro-

Table 5

CHANGES IN SELLING PRICES AND IN PRODUCTION COSTS, 1927-1933

MANUFACTURING INDUSTRIES OF THE UNITED STATES

(All price and cost index numbers define changes per unit of manufactured product.)[1]

Year	*Average selling price*	*Average cost of materials*	*Average cost of fabrication*	*Average labor cost*	*Average overhead costs plus profits*
1927	100	100	100	100	100
1929	98	96	101	93	107
1931	76	71	85	81	88
1931	100	100	100	100	100
1933	88	88	90	85	94

[1] Relating to 112 manufacturing industries for the years 1927-31, and to 60 manufacturing industries for the years 1931-33. For the earlier period, the indexes are derived from weighted averages; for 1931-33, the figures shown are unweighted medians. Both indexes are based upon data originally compiled by the United States Bureau of the Census.

duction costs and of changing selling prices for the products of manufacturing industries.

Table 5 presents measurements relating to these movements.

The bundle of materials and services represented by the final product of manufacture sold in 1931 at an average price 24 per lower than in 1927 and 22 per cent lower than in 1929.[7] The two major components of this price differed markedly in degree of decline. Material costs per unit of manufactured goods were 29 per cent lower in 1931 than in 1927, while fabrication costs were but 15 per cent lower. If we measure changes with reference to 1929 as base, we find declines of 26 and of 16 per cent, respectively, in these two series. The two elements of fabrication costs, in their turn, differed substantially. In 1931 labor costs per unit of manufactured product were some 19 per cent lower than in 1927, while the composite of overhead costs and profits, per unit of product, was but 12 per cent less. The changes from 1929 to 1931 were more nearly equal, however, being approximately 13 per cent for labor costs and 18 per cent for overhead plus profits. The shift of base makes a noticeable difference, for 1929 was marked by relatively low labor costs and by high charges in the form of overhead costs and profits, per unit of product.

[7] These index numbers of average selling price, derived from Census data of quantities produced and of aggregate values, show general agreement with index numbers derived directly from price quotations. A comparison follows:

INDEX NUMBERS OF SELLING PRICES OF MANUFACTURED GOODS

Year	*National Bureau of Economic Research (derived from Census data)*	*United States Bureau of Labor Statistics (average of prices of semi-manufactured and manufactured goods)*	*National Bureau of Economic Research (derived from price quotations)*
1927	100	100	100
1929	98	99	99
1931	76	80	80

From 1931 to 1933 there was little difference of movement among the two major divisions of cost. Material costs per unit of product dropped 12 per cent, while fabrication costs declined 10 per cent. During this period, however, a notable difference developed between the two components of fabrication costs. Labor costs per unit of manufactured product dropped 15 per cent, while overhead costs plus profits declined only six per cent.[8]

DIVERSITY OF THE FORTUNES OF MANUFACTURING INDUSTRIES IN RECESSION AND DEPRESSION

The figures we have been discussing are averages, relating to manufacturing industries in general. All such averages suffer from the fact that the measurements for the hundreds of individual industries entering into the total differ among themselves. These differences may, under certain circumstances, be very wide indeed. It is of interest to know just how divergent the fortunes of different manufacturing industries have been during the four years of recession and depression extending from 1929 to 1933. We shall not truly grasp the nature of the economic storm to which the country has been exposed unless we have some conception of the degree to which individual manufacturing industries differed among themselves with respect to changes in output, productivity, selling prices of their products, and elements of manufacturing cost.

A striking portrayal of the divergence of fortunes among different manufacturing industries in these respects is afforded by the series of graphs in Figure VI. In each of these graphs the measurement relating to a change in a single industry over a two-year period is represented by a single line. Since the records available for the period

[8] It is unfortunate that the available data provide us only with composite figures relating to the movements of overhead costs and profits. The two elements of the composite are affected by quite different influences during periods of business expansion and recession, and are related in quite different ways to the movements of final selling prices.

1929-31 are more complete than are those available for 1931-33,* the number of industries represented in the first of each pair of graphs is larger than the number in the second.

To facilitate the interpretation of these graphs, arrows have been placed along the scales to indicate the locations of the median values and of the first and third quartiles. The median (second quartile) is, of course, that point on the scale which halves the total number of observations. The quartiles, similarly, are points so located on the scale of values as to divide the entries for all the industries recorded into quarters. Thus the middle half of all the industries represented in each diagram falls within the upper and lower arrows placed on the right-hand scale.

The diagrams in Figure VI relate to changes in the physical volume of production and in the average selling prices of the products of different manufacturing industries. The nature of these movements is described, in summary form, by the entries in Table 6. This table also includes figures defining the average (median) change and the degree of 'scattering' among measurements relating to productivity and to various elements of manufacturing cost. Limitations of space prevent the graphic portrayal of the separate measurements, in all these cases, but the summary figures are significant.

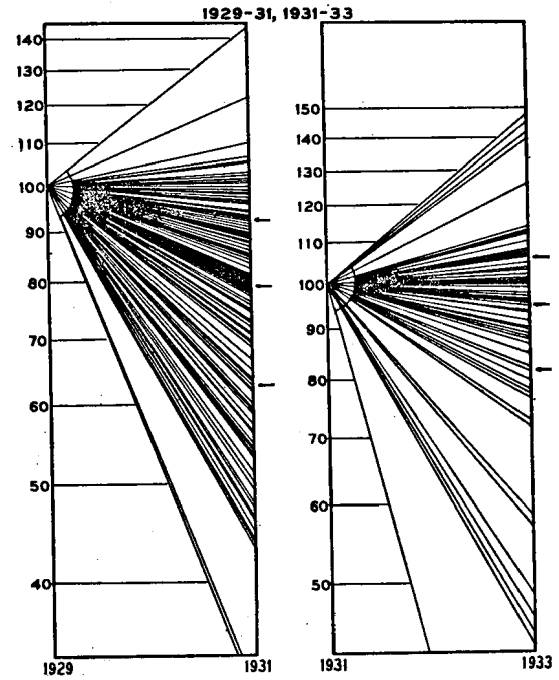
The output of manufacturing industries as a whole declined sharply, of course, between 1929 and 1931. But there was wide variation in degree of decline, as is shown by the scattering of the radial lines representing individual industries. That the impact of recession falls with uneven force upon different industrial groups is clearly revealed in this extraordinary divergence. Much less pronounced was the variation among industries in respect of changes in productivity. Changes in factors of organization, of technical equipment, of skill in the working force appear to affect different industries in a much more uniform manner than do the shifts in market conditions which are reflected in the volume of physical output.

Manufacturing industries are marked by greater coherence in respect of price and cost changes than in the changes in volume of output. The measure of variation in selling price changes from 1929 to 1931 is just half that found among measurements of changes in volume of production. This is probably to be expected. The market impresses uniformities of behavior upon industry through the price ties which bind economic elements together. Manufacturing industries, moreover, are in a better position to enforce policies of price maintenance than are most industries producing raw materials. This uniformity is especially marked among measurements of changing labor costs, and is most conspicuously absent among the indexes of change in the composite, overhead costs and profits. Here differences in the relative importance of capital equipment and in the notoriously variable factor of profits introduce wide divergencies in the movements of the measurements relating to different manufacturing industries.

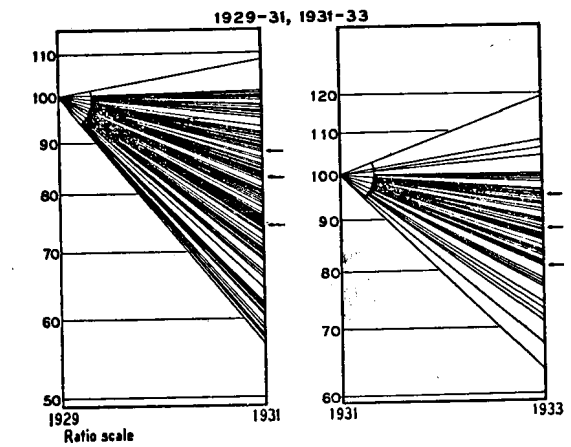
*Census records for 1933 have not as yet been released for all manufacturing industries.

Figure VI

A. INDEXES OF PHYSICAL VOLUME OF PRODUCTION, INDIVIDUAL MANUFACTURING INDUSTRIES OF THE UNITED STATES



B. SELLING PRICES OF PRODUCTS OF INDIVIDUAL MANUFACTURING INDUSTRIES OF THE UNITED STATES



SUMMARY

Our first concern in this *Bulletin* has been to summarize recent price movements, viewing them with reference to the relations prevailing among major elements of the price

Table 6

CHANGES IN VOLUME OF PRODUCTION, IN PRODUCTIVITY, IN AVERAGE SELLING PRICE AND IN ELEMENTS OF PRODUCTION COST, 1929-1933

MANUFACTURING INDUSTRIES OF THE UNITED STATES

The measurements presented define the average (median) change and the degree of dispersion among individual manufacturing industries[1]

	1929-1931			*1931-1933*		
	Median		*Degree of dispersion (per cent)*	*Median*		*Degree of dispersion (per cent)*
	1929	*1931*	*1931*	*1931*	*1933*	*1931*
Physical volume of production	100	79	18	100	95	13
Average selling price, per unit	100	83	9	100	88	8
Average cost of materials, per unit	100	78	10	100	88	9
Average cost of fabrication, per unit	100	88	10	100	90	9
Average labor costs, per unit	100	88	8	100	85	7
Average overhead costs plus profits, per unit	100	86	15	100	94	14
Output per wage-earner	100	99	9	100	95	8
Output per man-hour	100	111	9	100	104	5

[1] The measure of dispersion is secured by expressing one-half the range between the first and third quartiles as a percentage of the median value. The median values given are derived from unweighted measurements. All the indexes relate to changes per unit of manufactured product.

system prior to the recession of 1929. For an understanding of the importance of recent changes we should recall the characteristics of the price situation at the beginning of 1933, and the nature of the problems presented by the conditions then prevailing. Prices to consumers of finished goods were high, with reference to the prevailing price level; the prices of raw materials, on which the incomes of important consuming groups depend, were very low. The prices received by producers of agricultural products, in particular, were seriously depressed, while the prices paid by farmers for goods needed for production and for family maintenance were high. Low prices of the raw materials of industry, coupled with relatively high prices for finished goods, put manufacturers in an advantageous trading position. This price advantage, of course, was largely fictitious, because the volume of goods produced and sold was so abnormally low. On the investment side, however, there prevailed relatively high prices for goods entering into capital equipment and for building materials, a condition which (with other circumstances) tended to restrict activity in industries producing capital goods. A factor which has in the past served to stimulate revival from depression was thus reduced materially in potency.

These conditions presented certain definite problems. One was how the flow of goods to consumers was to be stimulated when the real value of raw materials was so low, in comparison with earlier standards, and the real value of consumers' goods so high.[10] The restoration of activity in industries producing capital goods, when production and sales were low in volume and the costs of new equipment excessively high, constituted a second major problem.[11]

The first push of the price recovery that was initiated in March of 1933, tended to restore earlier relations through a rapid advance of the more seriously depressed prices. The effects of this movement are clear in Figure II, which shows the sharp reduction of major disparities between February, 1933, and July, 1933. The reaction of the fall months reversed this tendency. It appeared that new forces had been released, following the summer advance, which threatened to increase prices already relatively high, and thus perpetuate the difficulties created during the recession. The price movements of the last twelve months, however, have definitely operated, in every major category, to lessen the disparities in the price system. Advancing raw material prices have enhanced the purchasing power of raw material producers. The margin representing costs of fabrication has been reduced. The obstacles to activity in the capital goods industries created by the persistence of exceptionally high prices among building materials and articles of capital equipment have been partially overcome. A situation that looked black twelve months ago, because of the apparent check suffered by forces of readjustment, bears a brighter aspect now. Physical activity still lags, it

[10] For the effect of low prices of materials was to reduce the aggregate purchasing power of an important group of consumers. Impaired volume of activity stemming from this condition served, in turn, to reduce incomes of other consuming groups. Behind these difficulties, of course, lay more profound problems of impaired balance, but the price conditions we have emphasized were at least the proximate causes of reduced trading activity.

[11] Each of these problems involves factors beyond the field of prices, but it is the price phase which now concerns us.

For a fuller discussion of the significance of the price disparities opened during the depression, see earlier *Bulletins* of this series, especially *Bulletin 48* (October 31, 1933).

is true, and such activity is the final index of economic health. But some important obstacles to the renewal of physical activity in the production and distribution of goods have been removed and others have been reduced. Ameliorative tendencies have been at work in the complicated structure of prices. In this there is ground for hope.

Other evidence of substantial gains in the purchasing power of important economic elements is found in the records for important producing groups. Estimates for 1934, based upon such data as are now available, indicate that price and production factors have combined to increase gross income for producers of raw minerals, for manufacturing producers, and for construction industries. Among farm producers price gains have offset production losses, and in the railroad transportation industry a modest production gain has been more than enough to offset a slight decline in average price per unit of service rendered. Without exception, among these five groups, 1934 gross incomes promise to exceed those for 1933.

In tracing the recent experience of manufacturing industries emphasis has been placed upon the notable gains in productivity which have persisted throughout the depression. From 1929 to 1933 there appears to have been an advance of approximately 15 per cent in output per man-hour, this on top of a gain of 41 per cent in output per capita during the preceding ten years. This increase in productivity and a parallel reduction in hourly wage rates during the stage of business recession have made possible a steady reduction in labor cost per unit of manufactured product. The decline in labor cost per unit of product probably exceeded 25 per cent from 1929 to 1933. Material costs per unit have declined by a greater percentage, and the decline of overhead costs plus profits approximates that of labor costs. The 1929 standard of reference is not altogether satisfactory, since labor costs and material costs were relatively low in that year, while overhead costs, in combination with profits, were high. On an earlier base, the latter element still appears to have been disproportionately high in 1933. Reduction of the fixed elements of manufacturing costs is always a slow and painful process in periods of slack business, and this depression has been no exception to the rule. Notably heavy investment in capital equipment during the preceding period of expansion has added to the current difficulties of readjustment.[13]

This survey has dealt with recent changes in certain elements of the price system, and related factors of cost and productivity. The elements studied are, in some degree, of strategic importance in the recovery situation.

[13] This investment, it is proper to say, was the chief means through which industrial productivity was increased and labor cost reduced during this period of expansion.

Appendix Table A

INDEX NUMBERS OF WHOLESALE PRICES

Commodity group	*July 1929*	*Feb. 1933*	*Oct. 1933*	*Nov. 1933*	*Dec. 1933*	*Jan. 1934*	*Feb. 1934*	*Mar. 1934*	*Apr. 1934*	*May 1934*	*June 1934*	*July 1934*	*Aug. 1934*	*Sept. 1934*	*Oct. 1934*
All commodities	100.0	61.7	74.5	74.6	74.3	75.7	76.9	77.0	76.6	77.1	78.2	78.4	80.0	80.9	80.0
Raw materials	100.0	50.6	65.2	66.0	65.9	67.1	68.7	68.4	68.0	68.1	70.3	71.2	73.8	75.3	73.9
Manufactured goods	100.0	68.7	80.3	80.1	79.7	81.0	82.0	82.3	82.0	82.6	83.0	82.8	83.7	84.4	83.1
Foods	100.0	50.0	61.1	60.9	59.6	61.7	64.1	64.5	63.5	64.3	67.4	68.6	72.8	75.5	73.6
Non-foods	100.0	69.1	83.0	83.3	83.6	84.4	84.9	84.8	84.8	85.0	84.8	84.5	84.3	84.3	84.0
Products of American farms, raw	100.0	39.5	54.6	55.1	54.6	57.2	59.4	59.1	57.9	57.8	62.0	63.1	67.5	70.0	67.7
All other products	100.0	68.2	80.3	80.3	80.1	81.0	82.0	82.2	82.1	82.7	82.9	82.9	83.5	84.1	83.5
Producers' goods	100.0	59.4	73.4	73.6	73.6	74.8	76.3	76.3	76.3	76.8	77.6	78.0	79.5	80.4	79.1
Consumers' goods	100.0	64.4	75.7	75.7	75.2	76.7	77.7	77.9	77.1	77.4	78.8	79.0	80.2	81.5	81.0
Producers' goods	100.0	59.4	73.4	73.6	73.6	74.8	76.3	76.3	76.3	76.8	77.6	78.0	79.5	80.4	79.1
Raw	100.0	49.1	64.6	64.9	64.8	65.9	67.9	68.0	68.0	68.3	69.8	70.9	73.8	75.7	73.5
Processed	100.0	71.4	83.4	83.4	83.6	84.9	85.6	85.6	85.5	86.3	86.4	85.9	86.0	85.9	85.5
For human consumption	100.0	45.8	63.0	62.9	62.5	64.6	67.0	67.0	66.3	66.2	67.8	68.8	72.2	73.9	71.7
For capital equipment	100.0	73.1	80.0	80.3	80.9	81.9	83.1	83.4	84.5	86.1	85.2	84.2	84.0	83.8	83.4
For building materials	100.0	75.8	87.6	88.4	88.7	87.7	87.9	87.9	88.2	89.1	89.3	88.5	87.7	87.2	86.9
Consumers' goods	100.0	64.4	75.7	75.7	75.2	76.7	77.7	77.9	77.1	77.4	78.8	79.0	80.2	81.5	81.0
Raw	100.0	55.8	67.3	68.9	69.4	71.1	71.1	70.2	67.7	67.0	71.9	72.6	73.4	74.0	75.3
Processed	100.0	66.5	78.0	77.5	76.7	78.1	79.3	79.8	79.4	80.0	80.4	80.5	81.9	83.3	82.4
Producers' goods intended for human consumption															
Foods	100.0	40.2	53.2	52.6	51.1	54.0	57.0	57.1	56.2	57.0	60.7	62.4	69.8	73.7	70.0
Non-foods	100.0	51.1	72.3	72.8	73.4	74.8	76.4	76.4	75.9	74.7	74.8	74.8	74.4	74.1	73.3
Consumers' goods, processed															
Foods	100.0	59.1	67.0	66.1	64.3	65.9	68.9	70.2	69.7	70.8	72.6	73.4	76.4	79.1	77.3
Non-foods	100.0	73.2	88.0	87.8	87.8	89.0	88.8	88.6	88.2	88.2	87.5	86.9	86.9	87.1	86.9

The records define a condition marked by badly tangled price relations at the end of 1932 and in early 1933. Subsequent movements, to October, 1934, have been irregular, but the net changes have worked toward higher real purchasing power of consumer groups, and lower real costs of fabrication and of capital construction. Definite progress has been made toward a readjustment of values and the creation of relations favorable to an increase in the movement of goods from producers to consumers.

Note on Sources of Data and Construction of Indexes

TABLE 1—The index numbers of wholesale prices and retail food prices are those of the United States Bureau of Labor Statistics. The indexes of cost of living and hourly earnings compiled by the National Industrial Conference Board have been combined with those of the Bureau of Labor Statistics to obtain the measurements here given. The indexes of retail prices of clothing and house-furnishings are those computed by Fairchild Publications from prices reported by leading retail organizations. The index numbers of farm prices and of prices paid by farmers are compiled by the United States Department of Agriculture from prices received by farmers for their crops and animal products and from prices paid for commodities used in production and family maintenance. The index of per capita earnings for manufacturing labor has been secured by dividing the index of factory payrolls of the Bureau of Labor Statistics by an index measuring changes in the number of persons on these payrolls.

TABLE 3—*Agriculture:* The production index consists of the index of net agricultural production of the Department of Agriculture for 1929-33; the 1934 figure is based on the Department of Agriculture crop estimates as of November 1, and the Department of Commerce index of marketings of animal products for the first ten months of the year. The price index is that of prices received by farmers (Department of Agriculture). The index

Appendix Table B

INDEX NUMBERS OF AVERAGE PURCHASING POWER, PER UNIT, OF COMMODITIES AT WHOLESALE IN THE UNITED STATES, 1927-1934

A. MAJOR COMMODITY GROUPS

Commodity group	*Index numbers of purchasing power, per unit*					
	1927-29 average	*July 1929*	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
Raw materials	100	101	83	91	88	93
Processed goods	100	100	111	105	107	103
Foods	100	102	82	90	84	94
Non-foods	100	99	111	106	110	104
Products of American farms, raw	100	102	65	84	75	86
All other products	100	99	110	105	107	104
Producers' goods	100	100	96	100	99	99
Consumers' goods	100	100	104	100	102	101

B. CLASSES OF PRODUCERS' AND OF CONSUMERS' GOODS

Classes of producers' goods	*Index numbers of purchasing power, per unit*					
	1927-29 average	*July 1929*	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
All producers' goods	100	100	96	100	99	99
Raw	100	101	81	90	88	93
Processed	100	99	115	110	111	106
Intended for human consumption	100	100	75	90	85	90
Intended for use in capital equipment	100	101	120	109	109	105
Intended for use in building materials	100	101	124	117	118	110
Producers' goods intended for human consumption	100	100	75	90	85	90
Foods	100	104	68	85	74	91
Non-foods	100	98	81	94	95	90

Classes of consumers' goods	*Index numbers of purchasing power, per unit*					
	1927-29 average	*July 1929*	*Feb. 1933*	*July 1933*	*Oct. 1933*	*Oct. 1934*
All consumers' goods	100	100	104	100	102	101
Raw	100	100	90	95	90	94
Processed	100	100	108	102	104	103
Consumers' goods, processed	100	100	108	102	104	103
Foods	100	101	97	93	91	98
Non-foods	100	99	117	109	117	107

of gross income of farmers is derived from the product of the price and production indexes.

Mining: The production index is that of the United States Bureau of Mines for 1930-33, extended by the National Bureau to cover the period 1929-33; the 1934 figure is based on the index of the Federal Reserve Board for the first ten months of the year. The price index has been computed by the National Bureau from wholesale prices of raw or slightly processed mineral products. The gross income index for 1929-33 is based on the value of mineral production (Bureau of Mines); for 1934 it is derived from the price and production indexes.

Manufacturing: The production index is that of the National Bureau for 1929-33, with the 1934 figure based on the index of the Federal Reserve Board for the first ten months of the year. The price index has been computed by the National Bureau from reports of the Census of Manufactures, interpolated and extrapolated on the basis of wholesale price data. The gross income figure is derived.

Construction: The index of gross income is based on estimates of the total value of private, public utility and public construction. The original data include compilations of the F. W. Dodge Corporation for private construction, records of expenditures on new construction and for maintenance of railroads and other public utilities, and construction outlays by federal, state and local governments. The 1934 figure is a very rough estimate.

The scope of the estimates is much greater than that of the contract figures for 37 states currently published by the Dodge Corporation, figures which indicate a much greater drop in 1932 and 1933, and a sharper rise in 1934. The price index is based upon currently published index numbers of construction costs. The production figure is obtained by dividing the index of gross income by the index of construction costs (see *Bulletin No. 51*, June 28, 1934, p. 3).

Railroad freight transportation: The index of gross income is based on the freight revenues of Class I railways (Interstate Commerce Commission). The production index is estimated from ton-miles of freight, and the price figure corresponds to freight revenue per ton-mile. The figures for 1934 are based on the first nine months of the year.

APPENDIX TABLES A AND B—These index numbers have been constructed by the National Bureau of Economic Research from price quotations compiled by the United States Bureau of Labor Statistics. They are derived from weighted aggregates of actual prices, with weights based on average quantities produced in 1927 and 1931. The index numbers for March to October, 1933, appear in *Bulletin No. 48* (October 31, 1933), p. 14.

FIGURES IV AND V—The production indexes are those of the Federal Reserve Board, adjusted for seasonal changes. The price indexes have been computed by the National Bureau of Economic Research (see note to Appendix Table A).

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

Oswald W. Knauth, *Chairman* — George Soule, *Vice-President*
Joseph H. Willits, *President* — Shepard Morgan, *Treasurer*
Charles A. Bliss, *Executive Secretary*

Research Staff

Wesley C. Mitchell, *Director*
Arthur F. Burns — F. R. Macaulay
Simon Kuznets — Frederick C. Mills
Leo Wolman
Eugen Altschul, *Associate*

Directors at large

Oswald W. Knauth — Elwood Mead
H. W. Laidler — Shepard Morgan
L. C. Marshall — George Soule
George O. May — N. I. Stone

Directors by University appointment

Edwin F. Gay, *Harvard*
Walton H. Hamilton, *Yale*
Harry Jerome, *Wisconsin*
Harry Alvin Millis, *Chicago*
Wesley C. Mitchell, *Columbia*
Joseph H. Willits, *Pennsylvania*

Directors appointed by other organizations

David Friday, *American Economic Association*
Lee Galloway, *American Management Association*
George E. Roberts, *American Bankers Association*
M. C. Rorty, *American Statistical Association*
Arch W. Shaw, *National Publishers Association*
Robert B. Wolf, *American Engineering Council*

The article that Dr. Mills contributes to this issue of the National Bureau BULLETIN *is the fifth of a series of annual reports on aspects of the current price situation with particular reference to the inter-group disparities found beneath the surface of general price averages. These price* BULLETINS *serve both as appraisals of current developments and as a convenient medium for the release of some of the price measurements the National Bureau has been developing. These first appeared in various volumes published by the National Bureau. Results of the initial study appeared in* THE BEHAVIOR OF PRICES *(1925), which is now out of print. Continuing his investigation of price movements Dr. Mills contributed a chapter to* RECENT ECONOMIC CHANGES *(1929), in which changes in the related factors of production volume and elements of cost were also considered. A survey of the divergent rates of growth n the various elements of the pre-War and post-War economy,* ECONOMIC TENDENCIES IN THE UNITED STATES *(1932), also devoted considerable space to the price aspects of modern economic development. As a further step in his research Dr. Mills is preparing a volume on recent changes in the structure of prices and a discussion of the significance of the developments that have characterized the recession and the recovery efforts of the past five years. It is expected that during the coming year a manuscript will be submitted for review to the Board of Directors.*

THE MITCHELL JUBILEE VOLUME

Readers of the *Bulletin* will be interested in the fact that, on the day when this issue went to press, a signal honor was paid to one of the founders of the National Bureau, one who ever since its inauguration has given direction and inspiration to its activities. On the evening of December 17, at a dinner in celebration of his sixtieth birthday, Professor Wesley C. Mitchell was presented with a volume of economic essays written in his honor by a group of former students. The range of the economic topics with which they deal as well as the variety of approach represented in the authorship testify to the catholicity and breadth of interest of the leader and teacher to whom they join in tribute. Of the essays contained in the volume five are by present or former members of the staff or Board of the National Bureau. The volume, entitled *Essays in Economics,* is published by the Columbia University Press.

A portrait of Dr. Mitchell, painted by Winifred Rieber, was presented on the same occasion, and tributes to him were paid by Dr. Edwin R. A. Seligman, Dr. Edwin F. Gay, Dr. Joseph H. Willits and Dr. Willard L. Thorp.

THE BULLETIN

With this issue the series of five *Bulletins* planned for 1934 is completed. For the convenience of our subscribers we print herewith a table of contents of the preceding four issues.

NATIONAL INCOME, 1929-1932
by Simon Kuznets

(No. 49, issued January 26, 1934; revised and extended, June 7, 1934; 12 pp., 10 tables, 2 charts, 25 cents)

Introduction ____ 1
Income Paid Out and Income Produced ____ 1
The Classification of National Income ____ 2
National Income, 1929-1932 ____ 3
Distribution by Types of Payment ____ 5
Distribution by Industrial Sources ____ 8
Summary. Reliability of Estimates ____ 10

RECENT CORPORATE PROFITS IN THE UNITED STATES
by Solomon Fabricant

(No. 50, issued April 18, 1934; 12 pp., 7 tables, 3 charts, 25 cents)

Profits of All Corporations in the United States ____ 1
Profits by Industrial Divisions ____ 3
Profits by Size of Corporation ____ 5
The Aggregate Income Account of All Corporations ____ 7
Dividend Policy and Corporate Savings ____ 10
Summary ____ 10

RECENT CHANGES IN PRODUCTION
by Charles A. Bliss

(No 51, issued June 28, 1934; 12 pp., 5 tables, 2 charts, 25 cents)

World Recovery ____ 1
Changes in the Total Volume of Production in the United States ____ 2
Changes in the Physical Volume of Foreign Trade 4
Changes in the Volume of Inventories ____ 5
Changes in Productive Efficiency, 1929-1933 ____ 6
The Changing Direction of Productive Activity in Depression and Recovery ____ 7
Summary ____ 9

Appendix

A. Changes in the Output of Individual Commodities 10
B. Notes on Sources of Data and Construction of Indexes ____ 11

GROSS CAPITAL FORMATION, 1919-1933
by Simon Kuznets

(No. 52, issued November 15, 1934; 20 pp., 12 tables, 3 charts, 50 cents)

I. Viewpoint and Scope of the Study ____ 1
II. The Average Volume of Gross Capital Formation and of the Flow of Non-Durable Commodities ____ 2
III. Fluctuations in Gross Capital Formation and in the Flow of Non-Durable Commodities ____ 5
IV. Summary ____ 13

Appendix

Steps in the Derivation of the Estimates and Some Further Details on the Volume of Production, Construction and Inventories ____ 14
1. Output and Flow of Finished Commodities ____ 14
2. The Volume of Total Construction ____ 15
3. Business Inventories ____ 17

Plans for the 1935 series of *Bulletins* are now announced by the editor, Dr. Mills. Subscribers may expect to receive during the course of the year five issues, three in the spring and two in the autumn. The topics will be selected from the tentative list of seven following:

Wage Changes during Depression and Recovery, by Leo Wolman

Business Profits, by Solomon Fabricant

Changes in the Volume and Character of Production during Depression and Recovery, by Charles A. Bliss

The National Bureau Technique for Measuring Cyclical Movements, by Wesley C. Mitchell and his associates

Recent Employment Changes in the United States, by Meredith B. Givens

Aspects of Recent Price Changes, by Frederick C. Mills

Changes in the Size and Industrial Distribution of the National Income during a Quarter of a Century, by Simon Kuznets

The *Bulletin* by Dr. Mitchell and his associates will describe the technique which the National Bureau has developed for measuring cyclical fluctuations of time series. The results obtained by applying this technique to some 600 time series will serve as the foundation of the National Bureau's forthcoming volume entitled, *Business Cycles: Analysis of Cyclical Behavior.* Although this *Bulletin* will be somewhat technical in character, it will introduce the presentation in later issues of certain results possessing special interest.

Mechanization in Industry

HARRY JEROME

Professor of Economics, University of Wisconsin

From the Preface by Frederick C. Mills:

"In the face of the vague conceptions current regarding mechanization we have had sore need of an account in realistic detail, but presenting these details in a broad economic setting, and interpreting them with reference to the mechanization process as a whole, and to related processes of economic life. For in dealing with the characteristics and consequences of mechanization, as in many other economic fields, a part, to be truly appraised, must be seen in its place in the whole working of the economic system.

It is a great virtue of Dr. Jerome's study that he has tried to do this difficult job and has, indeed, done it better than it has ever been done before. We find here a wealth of detail as to the actual changes which mechanization has involved over a wide area of industrial activity. Conveyors, electric hoists, mechanical stokers, concrete mixers, steam ditchers, steam-jet weed destroyers, rotary ballast sweepers, power tie tampers, portable escalators, trench excavators—these are the stuff of modern industry. Here is realism about the industrial process. But Dr. Jerome sees beyond his details. He has emphasized the wide range of consequences which must be traced if one is accurately to measure the effects of a mechanical change. In doing so he provides an effective corrective alike for the visions of doom and for the prophecies of a mechanical millennium."

478 pp., 55 tables, 5 charts $3.50

Condensed Table of Contents

I Origin and Scope of Survey

II Types of Labor-Saving Changes

III Changes in Mechanization in Selected Manufacturing Industries
- Iron and Steel (Blast Furnaces and Steel Works)
- The Manufacture of Brick
- Cotton Yarn and Cloth
- Garment Industries
- Pulp and Paper
- Commercial Printing
- The Glass Industry
- Lumber Manufacture and Wood-Working Industries
- Motor-Vehicle Industry
- Leather
- Shoes
- Beet Sugar
- Slaughtering and Meat Packing
- Tobacco Manufacture

IV Changes in Mechanization: Non-Manufacturing Industries
- Agriculture
- Mining
- Building Construction
- Stevedoring
- Communication
- Retail Coal Handling
- Production of Power
- Street Cleaning and Maintenance
- Technological Changes in the Amusement Industry
- Office Equipment
- Mechanization of Household Tasks
- Commercial Preparation of Food and Drink

V Changes in Mechanization: Handling of Materials

VI Measures of Change in Mechanization

VII Differences in Degree of Mechanization

VIII Characteristics of the Machine-Producing Industries

IX Factors Determining the Rapidity of Mechanization

X The Effects of Mechanization

(ready December 29)

National Bureau
of Economic Research

BULLETIN 54

MARCH 15, 1935

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Wages and Hours under the Codes of Fair Competition

Copyright 1935, National Bureau of Economic Research, Inc.

LEO WOLMAN

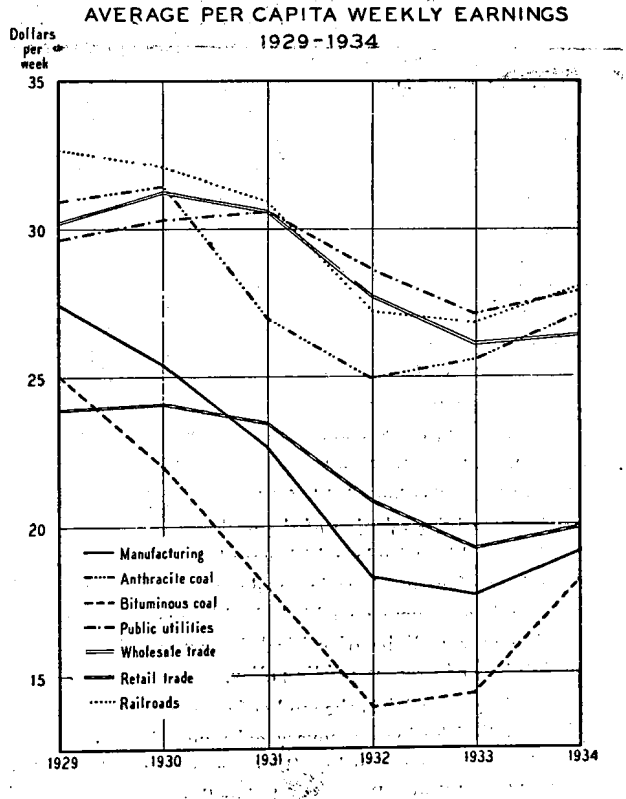
MORE than ordinary interest attaches to the movement of wages and hours in the United States during the past several years. In any analysis of the contemporary business situation, the degree to which wages have recovered from the prolonged decline beginning in 1930 is of fundamental importance. In addition, the entire range of new problems related to the effects of widespread government control over both wages and hours must now be taken into consideration. The nature and magnitude of the recovery reflect not only the customary forces of the market but also the influence of schedules of wages and hours fixed by public regulatory agencies.

Control over wages and hours began with the passage of the National Industrial Recovery Act on June 16, 1933. By means of the Codes of Fair Competition, negotiated by the National Recovery Administration with each industry, and the President's Reemployment Agreement (a temporary measure designed to raise wages and to lower hours in classes of employment not yet brought under codes) wages and hours in most of the major categories of employment were subject to some degree of regulation before the spring of 1934. At this writing wage and hour regulations apply to all manufacturing industries, to the extractive industries, to a large proportion of employment in wholesale and retail trade, to the public utilities, to transportation other than rail, and in lesser degree, to a variety of service occupations in many diverse fields of employment. In their totality these regulations over working conditions in American industry constitute an unprecedented phenomenon in this country, and they surpass in their scope similar legislative experiments in England, which only recently was far ahead of us in this area of social legislation.

The method of wage and hour regulation commonly used in the codes is to establish minimum rates of wages for unskilled and common labor, or for employees receiving the lowest rates of pay, and schedules of maximum hours for various classes of employees in each industry or category of employment. In a very few instances, scales of wages are fixed for all classes of employees in a given industry; and in rather more instances, minimum rates within an industry are fixed, not only for the lowest paid, but for groups of employees higher in the wage scale as well. The great majority of the codes, however, include only a single mini-

Chart I

AVERAGE PER CAPITA WEEKLY EARNINGS
1929-1934



mum, and that for the poorest paid. Whether specified in the code or not, it is the general understanding that prevailing wage differentials will be protected and that the relative position of more highly paid employees will not be impaired by the adoption of a minimum wage for common labor. In the regulation of hours of labor, likewise, there is a wide diversity of provision, but the net effect is to establish maximum weekly, and in some instances daily, hours beyond which no employer is allowed to work his men. The failure of many of the codes to make specific provision for wage differentials above the minima, and to strengthen hour regulations by imposing penalties for overtime, has aroused the suspicion that the labor terms of the codes are not generally enforced. Direct evidence on this point is clearly difficult to obtain, but the available measures of changes in wages and hours throw much light on the matter, if they do not finally settle it.

This American legislation differs from most of the European labor legislation, with which students of social history are familiar, not alone in its details, but more particularly in the economic theory on which it rests. The minimum wage and hour laws of modern times undertook simply to eradicate labor practices that can perhaps best be described as sweating. They aim, that is, to raise extraordinarily low wages and to prohibit excessively long hours. Even the advocates of such laws recognized their limitations. They saw the necessity for moderate and slow changes in conditions; and for establishing rates of wages and schedules of hours only after serious investigation and deliberation. They even admitted the possibility that the fixing of wages and hours might on occasion lead to the loss of jobs by the intended beneficiaries of the law. The present American conception, and hence practice, is radically different. It assumes, in part at any rate, that the wage rate is the key to the income of labor, and that, if wage rates are lifted, the earnings and income of labor will at the same time rise, and the income in the country increase proportionately. The goal of wage legislation, therefore, is to raise wages swiftly and substantially in the expectation that this will result in an expansion in the income of labor. The haste with which wages have been fixed and hours lowered since the summer of 1933 is a reflection of this faith in wage-fixing and work-sharing as a joint solution of the problem of unemployment. In view of this attitude, which now has a tenacious hold on the minds of many Americans, data on wage rates, hours and earnings assume an added significance, and their relationship may well be of critical importance in appraising the wisdom of current public policy.

The data essential to the study of wage movements during the period of business recovery exist now in much greater abundance than previously. The expansion of the facilities of the United States Bureau of Labor Statistics, the accumulation of data by the Division of Research and Planning of the National Recovery Administration, and the materials collected by code authorities for the administration of their affairs make available a great wealth of information. The statistical samples are larger and more representative, the types of employment covered are more varied, and the opportunities of comparing wage rates with earnings are greater for the period since 1932 than for the first years of the depression. In this *Bulletin* the attempt is made to trace the major movements of relevant series of wages through the observable phases of the depression and recovery. In dealing with phenomena so complicated as the economic processes of the past five years, the choice of turning points is difficult and must needs be to some extent arbitrary. Few periods of business recovery present a steady and uninterrupted ascent from the trough of the depression. In the current recovery there have been several reversals of the expected trend, but so far as the weekly earnings of employed labor are concerned, they have for some time been appreciably above the lows recorded in the accompanying tabulation. The difficulties of dating are still greater when the attempt is made to account for, and to measure the influence of, separate and independent economic forces. Thus the codification of industries under the NRA was spread over some nine months. Many industries anticipated the provisions of their codes by raising wages in advance. During the first phase of the NRA, wages were unquestionably affected by the speculative boom of the summer of 1933.

INDUSTRY	MONTH OF LOWEST WEEKLY EARNINGS
Manufacturing	March 1933
Extractive Industries	
Coal mining	
Anthracite	May 1933
Bituminous	April 1933
Other mining	
Metalliferous	July 1932
Non-metallic and quarrying	February 1933
Crude petroleum producing	September 1933
Public Utilities	
Telephone and telegraph	April 1933
Electric light and power and gas	September 1933
Electric railroads and motor buses	July 1933
Trade	
Wholesale	June 1933
Retail	December 1933
Class I Railroads	August 1932

Since the middle of 1932, moreover, evidences of economic recovery have been discernible in many parts of the world. The effects of these and of similar factors can often be detected in the data, but their true influence can be satisfactorily studied only by the methods of theoretical economic analysis.

The statistical measures of wages are, like those of many other economic series, samples and not total counts. In the expansion of wage materials during the past several

TABLE 1
AVERAGE PER CAPITA WEEKLY EARNINGS[1]
1929-1934

INDUSTRY	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*
Manufacturing	$27.36	$25.39	$22.51	$18.18	$17.60	$19.12
Extractive Industries						
Coal mining						
Anthracite	30.85	31.41	26.89	24.86	25.61	27.09
Bituminous	25.00	21.93	17.74	13.78	14.29	18.10
Other mining						
Metalliferous	30.12	28.13	22.99	18.63	19.21	20.82
Non-metallic and quarrying	26.28	24.73	20.95	15.99	14.50	15.58
Public Utilities	29.56	30.31	30.58	28.55	27.07	27.88
Trade						
Wholesale	30.19	31.24	30.61	27.72	26.11	26.35
Retail	23.80	23.95	23.44	20.75	19.20	19.89
Class I Railroads	32.62	31.99	30.87	27.15	26.83	28.04[2]

[1] *Source:* U. S. Bureau of Labor Statistics, except for Class I Railroads. The railroad statistics are based on data published by the Interstate Commerce Commission. The figures for public utilities are weighted averages computed by the National Bureau of Economic Research.
[2] First 11 months only.

years sample data for several classes of employment have proven to be less representative than for others and may well continue to be so until the samples taken are extended and improved. Comparison of these samples and the results of a census often disclose material disparities between the two sets of data. Thus, weekly earnings in wholesale trade, as measured by the current sample of the United States Bureau of Labor Statistics, show a decline from 1929 to 1933 of 13.5 per cent, while the census of wholesale trade, taken in 1933, would indicate a decline of 25.4 per cent. In retail trade the difference is between 19.3 per cent for the sample and 28.1 per cent for the census. In manufacturing, on the other hand, the differences are not so great. Weekly earnings, adjusted to the trend shown by the *Census of Manufactures for 1933,* were 34.0 per cent less in that year than in 1929, while measured by the sample, they were 35.7 per cent less.

It should be pointed out, finally, that the statistics of weekly earnings given in this *Bulletin* represent the income of employed labor. As such, they reflect changes in the amount of short-time and in the rate of wages, but not the loss in income suffered by those who are totally unemployed.

I WEEKLY EARNINGS

In comparison with the depression of 1921, actual per capita weekly earnings have, during this last depression, declined much more and over a considerably longer period. Whereas in the depression of 1921 the interval from the high to the low month in manufacturing industries was fifteen months, in the present depression the decline in weekly earnings in manufacturing industries lasted forty-seven months. Likewise the amount of the decline in the weekly earnings of manufacturing labor was 35 per cent then as against 44 per cent in the more recent period. A summary of per capita weekly earnings in specified categories of industry is presented, for each year from 1929 to 1934, in Table 1 and in Chart 1.

The most striking feature of Table 1 is the diversity of experience among the industries represented. Manufacturing, and the extractive industries, except anthracite coal, show drastic reductions in weekly earnings for the entire period, 1929-34, while the other industries show only a moderate decline. In general, weekly earnings in non-competitive industries and in industries in which wage rates were subject to some control have been, in view of the character of this depression, remarkably steady. In manufacturing industries the cutting of wage rates and the general use throughout the depression of the device of work-spreading largely account for the persistence of low levels of weekly earnings.

TABLE 2
AVERAGE PER CAPITA WEEKLY EARNINGS
PERCENTAGE CHANGES
1929 to 1933, 1933 to 1934 and 1929 to 1934

INDUSTRY	*1929 to 1933*	*1933 to 1934*	*1929 to 1934*
Manufacturing	—35.7	+ 8.6	—30.1
Extractive Industries			
Coal mining			
Anthracite	—17.0	+ 5.8	—12.2
Bituminous	—42.8	+26.7	—27.6
Other mining			
Metalliferous	—36.2	+ 8.4	—30.9
Non-metallic and quarrying	—44.8	+ 7.4	—40.7
Public Utilities	— 8.4	+ 3.0	— 5.7
Trade			
Wholesale	—13.5	+ 0.9	—12.7
Retail	—19.3	+ 3.6	—16.4
Class I Railroads	—17.7	+ 4.5[1]	—14.0[1]

[1] First 11 months of 1934 only.

In spite of a substantial recovery in weekly earnings during 1934, the earnings of manufacturing employees and of labor in the extractive industries remained far below the weekly earnings of 1929. Earnings of employees of public utilities, in wholesale trade, anthracite coal mining, and on railroads were, on the other hand, only slightly below the levels of 1929. It is, moreover, significant that the weekly earnings of manufacturing employees were in 1923 only 11 per cent below those of 1920, whereas in 1934 they were 30 per cent below 1929 (see Table 2).

While per capita weekly earnings recorded the changes shown in Table 2, the volume of both employment and payrolls increased substantially from 1933 to 1934 for many of the important classes of employment. The data on payrolls and employment in Table 3 indicate the changes which were the result in part of the reduction in the length of the work-week and in part of the increase in the volume of business activity.

TABLE 3
EMPLOYMENT AND PAYROLLS[1]
PERCENTAGE CHANGES
1933 to 1934

INDUSTRY	PAYROLLS	EMPLOYMENT
Manufacturing	+27.6	+14.2
Extractive Industries		
Coal mining		
Anthracite	+22.1	+15.3
Bituminous	+43.4	+13.7
Other mining		
Metalliferous	+29.6	+20.2
Non-metallic and quarrying	+19.8	+ 8.9
Crude petroleum producing	+29.0	+24.9
Public Utilities		
Telephone and telegraph	+ 4.8	− 0.1
Electric light and power and gas	+ 8.2	+ 6.3
Electric railroads and motor buses	+ 5.6	+ 2.9
Trade		
Wholesale	+10.9	+ 8.8
Retail	+10.3	+ 7.8
Service Industries		
Laundries	+ 8.9	+ 3.2
Cleaning and dyeing	+13.3	+ 3.8
Hotels	+19.7	+13.4
Class I Railroads[2]	+ 8.5	+ 4.4

[1] Computed from the indexes of the U. S. Bureau of Labor Statistics.
[2] First 11 months only.

The total volume of wage and salary disbursements, as estimated by the National Bureau of Economic Research, remained in 1934 far below 1929 for all classes of employment, and in construction they were in the later year only 17 per cent of their volume in 1929. Index numbers of wage and salary disbursements in 1934 are given in Table 4.

II THE COST OF LIVING

Since 1914 there have been several great swings in the general level of prices, and hence, in the cost of living. Between 1914 and 1920 the cost of living roughly doubled.

TABLE 4
WAGE AND SALARY DISBURSEMENTS IN 1934

INDUSTRY	INDEX NUMBER *1929=100*
Manufacturing	56.7
Extractive industries	49.1
Construction (private)	17.4
Telephone and telegraph	71.5
Electric light and power and gas	77.9
Trade[1]	61.7
Transportation[2]	54.1

[1] Includes wholesale and retail trade.
[2] Includes electric railroad, steam railroad and motor bus transportation.

During the depression of 1921 it fell nearly 25 per cent, rose slightly after 1922, and from 1925 to 1929 remained at approximately 70 per cent above the pre-War level. In the latest depression, living costs again fell more than 25 per cent, increased about 10 per cent over the low of April 1933 and are now roughly 20 per cent below 1929, 33 per cent below 1920, and 37 per cent above 1913, as may be seen in Table 5.

TABLE 5
INDEX NUMBERS OF THE COST OF LIVING[1]

YEAR	INDEX NUMBER *1913=100*	INDEX NUMBER *1929=100*
1929	170.8	100.0
1930	166.3	97.4
1931	151.8	88.9
1932	137.3	80.4
1933	130.9	76.6
1934	136.9	80.2

[1] Computed from the semi-annual indexes of the U. S. Bureau of Labor Statistics.

Among the items whose retail prices make up the index number of the cost of living, food and rent are now approximately at their 1913 level; clothing is one-third higher than it was in 1913; house furnishing goods are about 60 per cent above 1913; the fuel and light group, according to the classification of the United States Bureau of Labor Statistics, is also 60 per cent above the pre-War level, although within this group the average price of electric current for household use is below 1913 whereas the price of coal is much higher; and the miscellaneous group, including such items as carfare, fees for services and the like, is at practically double the pre-War level.

III REAL EARNINGS

It is a statistical commonplace that changes in the material standards of living of a population are the resultant of movements in the cost of living as well as of money income. Particularly in periods of rapidly changing prices, indexes of money wages may yield a totally misleading picture of the actual course of events. It is thus clear that a great rise in money wages may be completely neutralized by an equivalent increase in the prices of the goods bought, and that a severe decline in money wages may be mitigated by an equivalent drop in the cost of living. These elements

of the economic situation are illustrated in Table 6, which shows the course of real weekly earnings, that is, actual earnings corrected for changes in the cost of living, from 1929 to 1934. While actual weekly earnings in manufacturing fell 30.1 per cent from 1929 to 1934, real weekly earnings declined only 12.8 per cent. The real earnings of public utility employees actually increased 17.6 per cent, although their actual earnings had in the same period declined by 5.7 per cent.

TABLE 6
REAL AVERAGE PER CAPITA WEEKLY EARNINGS
PERCENTAGE CHANGES
1929 to 1933, 1933 to 1934 and 1929 to 1934

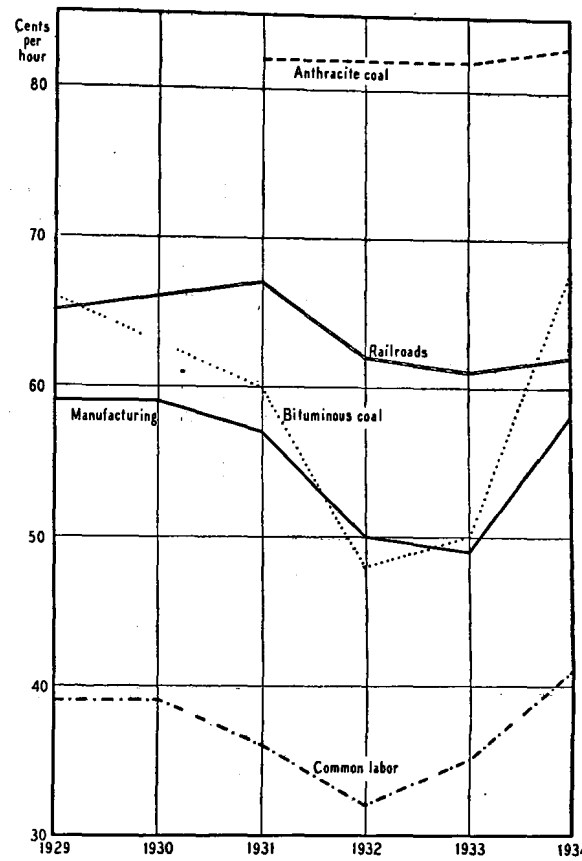
INDUSTRY	*1929 to 1933*	*1933 to 1934*	*1929 to 1934*
Manufacturing	−16.1	+ 3.7	−12.8
Extractive Industries			
Coal mining			
Anthracite	+ 8.4	+ 1.1	+ 9.5
Bituminous	−25.3	+21.0	− 9.7
Other mining			
Metalliferous	−16.7	+ 3.5	−13.8
Non-metallic and quarrying	−27.9	+ 2.6	−26.1
Public Utilities	+19.6	− 1.6	+17.6
Trade			
Wholesale	+12.9	− 3.6	+ 8.9
Retail	+ 5.4	− 1.1	+ 4.2
Class I Railroads	+ 7.4	− 0.2[1]	+ 7.2[1]

[1] First 11 months of 1934 only.

IV HOURLY EARNINGS

Hourly earnings measure the earning power of labor. They indicate how much a worker earns when he is at work. They are at the same time a measure of the price of labor in the labor market. And if allowance is made for changes in the productivity of labor, they are a rough indicator of the prevailing level of labor cost. When the government, through one or another of its regulatory agencies, fixes wages, it sets the rate of hourly earnings. It does not fix weekly, monthly or annual earnings, but establishes the appropriate hourly earnings, presumably in the hope that they will yield labor the anticipated weekly, monthly and annual earnings. Fixing wages, then, is like fixing any price that is established at a specified level in the expectation that it will yield a specified income. Thus public utility rates are established at specified levels in the expectation that such a schedule of rates will yield a specified volume of business and hence a specified income. To the extent to which the actual volume of business and of income falls short of the estimated, the established schedule of rates may be said to represent an error in judgment. The same thing is roughly true of the fixing of wage rates. Much of the current confusion concerning the movement of wages rests upon the failure to distinguish between rates of wages and earnings.

Chart 2
AVERAGE HOURLY EARNINGS
1929-1934



Except for manufacturing, rail transportation, and a limited number of occupations, data on hourly earnings are available for only the past several years. From the high to the low of this depression, the hourly earnings of manufacturing labor apparently declined between 20 and 30 per cent. The recovery in hourly earnings has been rapid and great. Where it is possible to piece together the pertinent figures, they show that the losses in hourly earnings suf-

TABLE 7
AVERAGE HOURLY EARNINGS, 1929-1934

INDUSTRY	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*
Manufacturing[1]	$.59	$.59	$.57	$.50	$.49	$.58
Coal mining[2]						
Anthracite	....	....	.82	.82	.82	.83
Bituminous	.66	....	.60	.48	.50	.68
Class I Railroads[3]	.65	.66	.67	.62	.61	.62[4]
Common Labor in Road Building[5]	.39	.39	.36	.32	.35	.41

[1] National Industrial Conference Board.
[2] U. S. Bureau of Labor Statistics.
[3] Computed by the National Bureau of Economic Research from data published by the Interstate Commerce Commission.
[4] First 11 months only.
[5] U. S. Department of Agriculture, Bureau of Public Roads.

TABLE 8
ACTUAL AND REAL HOURLY EARNINGS[1]
PERCENTAGE CHANGES
JUNE 1933 TO LAST QUARTER OF 1934

INDUSTRY	PERCENTAGE CHANGES IN HOURLY EARNINGS: ACTUAL	REAL
Manufacturing	+33.0	+22.0
Extractive Industries		
Coal mining		
Anthracite	+ 0.7	— 7.6
Bituminous	+56.4	+43.5
Other mining		
Metalliferous	+24.3	+14.0
Non-metallic and quarrying	+27.7	+17.2
Crude petroleum producing	+23.2	+13.0
Public Utilities	+10.8	+ 1.7
Telephone and telegraph	+ 4.5	— 4.1
Electric light and power and gas	+23.8	+13.6
Electric railroads and motor buses	+ 7.8	— 1.1
Trade		
Wholesale	+19.7	+ 9.8
Retail	+23.2	+13.0
Class I Railroads[2]	+ 3.5	— 5.0
Common Labor in Road Building[3]	+24.2	+13.9

[1] Based on data published by the U. S. Bureau of Labor Statistics. The figures for public utilities are based on weighted averages computed by the National Bureau of Economic Research.

[2] Based on figures computed by the National Bureau of Economic Research from data published by the Interstate Commerce Commission. 1934 data are for October and November only.

[3] U. S. Department of Agriculture, Bureau of Public Roads.

fered during the depression had by the close of 1934 been substantially made up, and that hourly earnings were then not far below the levels of 1929 (see Chart 2 and Table 7).

Since the NRA has been operative, from June 1933 to the end of 1934, both actual and real hourly earnings have increased very substantially in practically all categories of industry, and real hourly earnings have declined only in those industries in which rates of wages were already high and had not been reduced materially during the course of the depression (see Table 8). Thus the hourly earnings in anthracite coal mining have been above 80 cents an hour since 1929; they were not reduced during the depression and were not increased in the months of recovery. The hourly wages of telephone and telegraph workers were likewise high, 71 cents an hour in June 1933, and were consequently not greatly increased thereafter. The same is true of railroad wages, which were cut 10 per cent in February 1932 and are now approximately 4 per cent below 1929.

During the period when actual and real hourly earnings were changing at the indicated rates, both actual and real weekly earnings were advancing much more slowly. Table 9 compares the rates of change in these two related series. Furthermore, hourly earnings in manufacturing were, in the last quarter of 1934, as high as they were in 1929, whereas the actual weekly earnings of the same class of employees were 30 per cent below the level of 1929. Similarly the hourly rate of wages of railroad workers was, toward the end of 1934, 4 per cent below 1929, but actual weekly earnings were 12 per cent below. Again, soft-coal miners had a higher rate of hourly wages in the last quarter of 1934 than in 1929, but their weekly earnings were 25 per cent less.

TABLE 9
COMPARISON OF PERCENTAGE CHANGES IN ACTUAL AND REAL HOURLY EARNINGS AND IN ACTUAL AND REAL WEEKLY EARNINGS[1]
JUNE 1933 TO THE LAST QUARTER OF 1934

INDUSTRY	PERCENTAGE CHANGE: HOURLY EARNINGS ACTUAL	HOURLY EARNINGS REAL	WEEKLY EARNINGS ACTUAL	WEEKLY EARNINGS REAL
Manufacturing	+33.0	+22.0	+ 6.6	— 2.2
Extractive Industries				
Coal mining				
Anthracite	+ 0.7	— 7.6	— 3.1	—11.1
Bituminous	+56.4	+43.5	+51.4	+38.9
Other mining				
Metalliferous	+24.3	+14.0	+13.5	+ 4.1
Non-metallic and quarrying	+27.7	+17.2	— 0.3	— 8.5
Crude petroleum producing	+23.2	+13.0	+ 1.4	— 7.0
Public Utilities	+10.8	+ 1.7	+ 5.4	— 3.3
Telephone and telegraph	+ 4.5	— 4.1	+ 6.6	— 2.2
Electric light and power and gas	+23.8	+13.6	+ 4.5	— 4.1
Electric railroads and motor buses	+ 7.8	— 1.1	+ 4.8	— 3.9
Trade				
Wholesale	+19.7	+ 9.8	+ 2.4	— 6.1
Retail	+23.2	+13.0	+ 4.5	— 4.1
Class I Railroads	+ 3.5	— 5.0	+ 5.1	— 3.6

[1] For sources, see Table 8.

On the whole such records as we have indicate that hourly earnings have returned to their pre-depression levels. In light of the decline in the cost of living, real hourly earnings are now substantially higher than they were in 1929, and even in 1920, for employees on the railroads, in manufacturing, for common labor, and, judged by the prevailing levels of hourly earnings at the end of 1934, probably for many other categories of industry as well (see Chart 3 and Table 10).

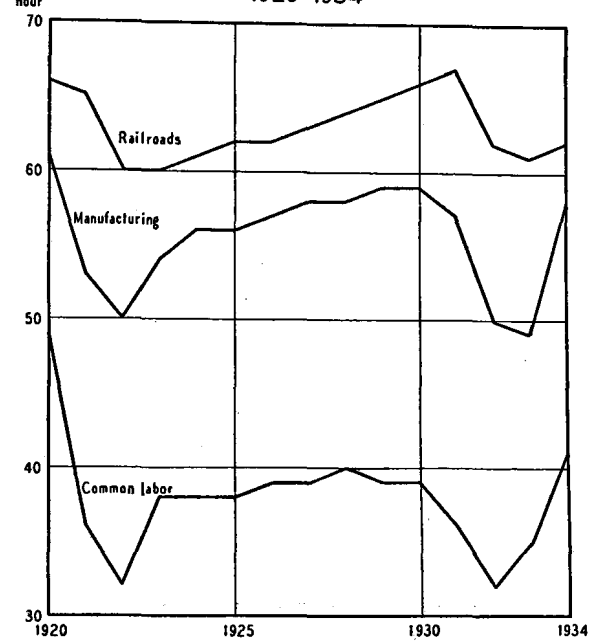
TABLE 10
AVERAGE HOURLY EARNINGS, 1920-1934

YEAR	MANUFACTURING[1]	CLASS I RAILROADS[2]	COMMON LABOR IN ROAD BUILDING[3]
1920	$.61	$.66	$.49
1921	.53	.65	.36
1922	.50	.60	.32
1923	.54	.60	.38
1924	.56	.61	.38
1925	.56	.62	.38
1926	.57	.62	.39
1927	.58	.63	.39
1928	.58	.64	.40
1929	.59	.65	.39
1930	.59	.66	.39
1931	.57	.67	.36
1932	.50	.62	.32
1933	.49	.61	.35
1934	.58	.62[4]	.41
Percentage change in real hourly earnings, 1920-34	+44.5	+42.7	+27.2

[1] National Industrial Conference Board.
[2] Computed by the National Bureau of Economic Research from data published by the Interstate Commerce Commission.
[3] U. S. Department of Agriculture, Bureau of Public Roads.
[4] First 11 months only.

Major changes in wages and the cost of living, of the magnitude here recorded, clearly do not affect all industries and all occupations in the same way. The wide diversity of the movements in weekly and hourly earnings among important categories of industry has already been pointed out. Data which would throw light on the disparate movement of wages among workers of varying degrees of skill are sparse, and such as they are, are presumably less reliable than the figures so far used. Inadequate but interesting samples published by the National Industrial Conference Board indicate, however, that while the hourly wage rates of unskilled labor have increased somewhat more rapidly than the wages of the skilled, the disparity is not substantial enough to have disturbed the wage differentials characteristic of manufacturing industries in this country. For female labor in manufacturing the hourly wage rates increased much more substantially than those for male, with the consequence that the differential between the wages of men and women in manufacturing was narrower in 1934 than in any year of the period from 1920 to date.

Chart 3
AVERAGE HOURLY EARNINGS
1920-1934



V HOURS OF WORK

The hours of labor fixed in the Codes of Fair Competition are the full-time hours per week, or the maximum work-week. Such regulation of hours is effective, therefore, only when labor is fully employed and when the reduction in the maximum work-week spreads the available employment over a larger number than would otherwise have been employed. The most satisfactory record of changes in the full-time hours of work is to be had for the manufacturing industries. The available data show that the maximum work-week declined from 57.3 hours in 1909 to 51.2 hours in 1919; remained at practically that level from 1920 to 1929; and during the depression increased again to probably as much as an average of 55 hours for all manufacturing. The great majority of the codes provide a maximum work-week of 40 hours; a lesser number of 36 hours; and only a few of more than 40 hours. It may be estimated that the average full-time week in manufacturing is now between 40 and 44 hours. This represents a radical decline in the hours of labor and means that, under prevailing business conditions, there is considerable work-spreading and sharing of work with a consequent reduction in the average weekly earnings and annual earnings of those who are employed.

2. Stockholders
Profits and the Use of Preference Stocks
Earning Power in Relation to Size of Enterprise
Common Dividend Policies and Surplus Accumulation
Other Financial and Operating Characteristics
Further Analysis of Accounting Records

ANNUAL MEETING

At their annual meeting on February 4 the Directors of the National Bureau of Economic Research welcomed Frederick M. Feiker from the American Engineering Council to succeed Robert B. Wolf, who had resigned because of absence in the Far West.

A resolution adopted by the American Statistical Association at its meeting on December 29, 1934, was read as follows:

> Whereas this year marks the fifteenth anniversary of the National Bureau of Economic Research; and whereas during its fifteen years of existence the Bureau has made most notable contributions in the field of Statistics; and whereas during the entire period the American Statistical Association has been most ably represented by Colonel Malcolm C. Rorty acting as a Director of the Bureau:
>
> Now, therefore, be it resolved that the members of the American Statistical Association assembled in annual convention convey to the National Bureau of Economic Research and to its representative, Colonel Rorty, our appreciation of their achievements.

The Annual Report of the Director of Research, Wesley C. Mitchell, was read and accepted and is now ready for distribution. Copies will gladly be sent on request.

REVIEWS

BOOK-OF-THE-MONTH CLUB NEWS, FEBRUARY 1935

"A 'must' book for the serious-minded economics student is *Mechanization in Industry* ($3.50), by Harry Jerome, one of the publications of the National Bureau of Economic Research. A book with that imprint needs no further bush for the increasing number of those who are seriously studying, in their spare time, how our economic wheels go round. As the title indicates the book is a detailed inquiry into the relation of the machine to contemporary economic life."

THE ANNALIST, February 22, 1935, wrote as follows of *Mechanization in Industry* (484 pp.):

> "Whether the facts of our economic organization can be marshaled rapidly enough to catch up with the imaginings of false prophets is a serious question these days. It takes much longer, naturally, to expound the latest popular theory, so that there are not many grounds for hopefulness. Nevertheless some of our research organizations are making valiant efforts, and the present volume is one of them.
>
> It is one of the virtues of recent publications of the National Bureau that the results of what is usually a comprehensive research project are summarized in the first chapter. In this case the findings may be still further summarized as follows:
>
> 1. A continuing increase in mechanization at at least a moderate pace may be expected.
>
> 2. No more likely than a near cessation of mechanical progress is the danger of an uncontrollably rapid mechanization. It does not appear probable that in the near future conditions will be exceptionally favorable for rapid mechanization.
>
> 3. Changes in the rate of mechanization, although limited, are not negligible. The rate of change is relatively stable; but this means, not that there are no significant changes in the rate of mechanization but that rather that they are within limits that are to a reasonable degree predictable.
>
> 4. There are some ill effects requiring thoughtful consideration, but the rate and extent of mechanization are not beyond reasonable possibility of prediction and control, or at least the effects can be foreseen and ameliorated. Progress brings technological unemployment which, even in the case of changes representing a net gain to society, may bring losses to individual workers. There is also reason to suspect that mechanization may aggravate cyclical fluctuations through intensifying competition.
>
> These conclusions may appear to the casual reader to throw little light on the problem; and it is doubtless true that the author discovered some difficulty in reaching any broad conclusions which would be valid throughout industry in general. But that very fact is significant in this age of dogmatism, and when we come to the situation in individual industries the book provides a careful and valuable analysis of the facts in each instance. Like so many economic problems, circumstances surrounding the individual industry alter entirely the problem of mechanization; and from this date forward, because of Dr. Jerome's research, it will be both possible and necessary to examine the facts in each case before engaging in the popular pastime of advancing a new 'plan' for the more abundant life."

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

OSWALD W. KNAUTH, *Chairman* — GEORGE SOULE, *Vice-President*
JOSEPH H. WILLITS, *President* — SHEPARD MORGAN, *Treasurer*
CHARLES A. BLISS, *Executive Secretary*

Research Staff

WESLEY C. MITCHELL, *Director*
ARTHUR F. BURNS — F. R. MACAULAY
SIMON KUZNETS — FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, *Associate*

Directors at large

OSWALD W. KNAUTH — ELWOOD MEAD
H. W. LAIDLER — SHEPARD MORGAN
L. C. MARSHALL — GEORGE SOULE
GEORGE O. MAY — N. I. STONE

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
ARCH W. SHAW, *National Publishers Association*
FREDERICK M. FEIKER, *American Engineering Council*

National Bureau of Economic Research

BULLETIN 55

APRIL 11, 1935

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Profits, Losses and Business Assets, 1929-1934

Copyright 1935, National Bureau of Economic Research, Inc.

SOLOMON FABRICANT

THE large business losses in 1932, the decline in annual deficits in 1933, and the further improvement in 1934 are already well known. So much have we learned from current financial reports of large corporations. But figures that relate to business profits constitute a peculiarly significant index in an industrial economy. Profits represent, at once, gains of enterprise arising from the conjuncture of past events and decisions, and influences upon current judgments concerning the future. It is well, therefore, to check conclusions derived from samples and estimates by the data on corporate profits issued by the Treasury Department. These comprehensive figures cover all the taxable corporations in the United States, small as well as large.

What was the earnings position of business enterprise as a whole at the bottom of the severest depression of the last half century? How did the net incomes of large and small companies, of different industrial groups, compare in 1932? How did corporate incomes respond to the complex of factors active in the first and second years of recovery? What effect did the drain upon business resources have upon the assets and condition of business between the end of 1929 and 1932? It is these questions that concern us in the present *Bulletin*.

There are now available complete and final reports covering profits and balance sheets of all corporations in the United States for 1932 (and earlier years), and preliminary data that make possible reliable estimates of net income of all corporations in 1933. Also, many large companies have already published reports covering 1934 operations. This *Bulletin* presents these figures, based chiefly on the official *Statistics of Income* issued by the United States Treasury Department, with emphasis on the course of profits and the condition of business enterprise since 1929.[1]

TABLE 1

NET EARNINGS OF ALL CORPORATIONS IN THE UNITED STATES,[1] 1929-1933

(*in millions of dollars*)

	1929	*1930*	*1931*	*1932*	*1933**
Net income before payment of income taxes[2]	9,130	1,960	—2,850	—5,200	—2,110
Income taxes	1,180	700	390	270	410
Net income after payment of income taxes	7,950	1,260	—3,240	—5,470	—2,520

*Preliminary estimates.

[1] Tax-exempt corporations and life insurance companies are excluded.

[2] The net income given here excludes dividends received from domestic corporations. The duplication arising from profits or losses on intercorporate holdings of securities remains, however. Of this we may take account, but only for the years 1930 to 1932, by reference to the figures on sales of capital assets. (These capital assets consist predominantly of securities, as is indicated by the fact that most of the losses on their sale appear in the accounts of the finance group of corporations.) We assume that sales of capital assets are chiefly intercorporate transfers. The figures, in millions of dollars, follow:

	1930	*1931*	*1932*
Net income (as above)	1,960	—2,850	—5,200
Loss on sale of capital assets (net)	290	1,400	1,560
Net income, before deducting loss on sale of capital assets	2,250	—1,450	—3,640

Sales of securities probably yielded a net profit in 1929 and 1933, as is suggested by the figures on capital gains and losses reported by individuals.

TOTAL CORPORATE PROFITS

The drastic decline in the aggregate net income of all corporations in the United States, from 1929 to 1932, is evident from Table 1. In 1929 corporate earnings constituted almost ten per cent of the national income; in 1932 corporate net income was negative. The partial recovery from 1932 to 1933, although insufficient to take the aggregate 'out of the red,' reduced considerably the drain upon the resources of American business. There are indications (discussed below) that in 1934 this drain had almost, if not quite, ceased.

Here, in terms of dollars and cents, we have the net results—as they affected selling prices, costs and volume of corporate business—of the economic and political factors in ferment during 1933. Three billion dollars measure the extent of improvement in business between the darkest year of depression and the end of the first year of recovery.

If we turn from earnings themselves to rates of earnings we have the figures in Table 2. Besides the rate of earnings

[1] Figures for earlier years appear in *Bulletin 50* of this series.

on stockholders' equity (net income relative to capitalization), earnings as a percentage of total capital are also given.[2] (The data on capital used here are book values, and are therefore subject to some qualification as measures of invested capital. Year-to-year *changes* in the true earnings rates are probably more accurately indicated than are the rates themselves.)

TABLE 2

RATES OF EARNINGS ON BOOK VALUE OF CAPITAL 1929-1933

ALL CORPORATIONS IN THE UNITED STATES[1]

	1929	*1930*	*1931*	*1932*	*1933**
Net income (after taxes) as a percentage of capitalization[2]	6.6	2.4	—0.7	—2.9	—1.2
Total profits (after taxes) as a percentage of total capital	6.2	2.9	0.7	—0.9	0.4

*Preliminary estimates.

[1] Tax-exempt corporations and life insurance companies are excluded. Book values of capitalization and total capital are as of the end of the year; for 1933, 1932 values have been used. The terminology employed here is explained in the text, footnote 2.

[2] Since intercorporate duplications in capital (the denominator of the earnings ratio) are not completely eliminated by the filing of consolidated returns, dividends received from other companies have not been subtracted from net income (the numerator of the ratio).

If we attempt to eliminate the duplications mentioned in the previous table (dividends received and losses on sale of corporate securities), we have the following figures for all corporations. The change from the above figures is small because the two corrections made offset each other in part.

	1930	*1931*	*1932*
Net income (after taxes) as a percentage of capitalization	1.7	—1.2	—3.4

Owing to the decline in capitalization between 1929 and 1932 the fall in earnings rates was less rapid than that in net income measured in dollars. Nevertheless the drop from 6.6 per cent in the peak year to a negative value of 2.9 per cent in 1932 is sharp. While considerable improvement took place from 1932 to 1933 net income as a percentage of capitalization was lower in 1933 than it had been in 1931.

The return on total capital is in decided contrast to net income alone. Total profits (including interest on long-term debt) were negative in only one year, 1932. In 1933 they were again positive.

All these figures, of course, relate to the total of all corporations in the United States. But not all companies made profits in 1929; nor did all companies suffer losses in 1932. We turn, next, to an examination of earnings as they varied with size of corporation.

PROFITS BY SIZE OF CORPORATION

How did large-scale corporate business compare with smaller enterprise in the worst years of the depression? Complete and reliable data concerning profits in 1932 are now available for the first time. These materials, compiled by the Treasury Department also for 1931, can be made to throw light on the relative earnings position of large and small companies. We may compare corporations of different sizes in respect of earnings on total capital as well as on stockholders' equity, and in respect of the return to management and capital combined as well as to capital alone. (The latter comparison is necessary if we are to take into account the influence of income taxation on the reporting of net income. Net income tends to be understated, and compensation of officers overstated, especially by small concerns.) The rates of earnings appear in Table 3; the ratios showing returns that include officers' compensation are given in Appendix Table I (p. 12).

[2] The terminology used by Ralph C. Epstein in *Industrial Profits in the United States* (National Bureau of Economic Research, 1934), pp. 595-600, has been used throughout this *Bulletin*, except that all profits figures are after deduction of income taxes, unless they are described otherwise. 'Net income' is net earnings after payment of all business expenses and fixed charges including Federal income taxes. 'Total profits' are the sum of 'net income' and estimated interest on bonds and mortgages payable. 'Capitalization' is book value of stockholders' equity. 'Total capital' is the sum of stockholders' equity and bonds and mortgages payable.

TABLE 3

RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES, 1931 AND 1932 CLASSIFIED BY SIZE OF CORPORATION[1]

SIZE (TOTAL NET ASSETS IN THOUSANDS OF DOLLARS)	NUMBER OF CORPORATIONS		MEASURE OF EARNINGS: NET INCOME AS A PERCENTAGE OF CAPITALIZATION		MEASURE OF EARNINGS: TOTAL PROFITS AS A PERCENTAGE OF TOTAL CAPITAL	
	1931	*1932*	*1931*	*1932*	*1931*	*1932*
Under 50	182,000	206,000	—21.7	—33.0	—18.2	—27.1
50-100	61,100	58,300	— 9.1	—14.0	— 6.5	—10.2
100-250	63,400	59,500	— 6.5	— 9.9	— 4.1	— 6.5
250-500	31,100	28,400	— 4.6	— 7.4	— 2.5	— 4.5
500-1,000	19,300	17,600	— 3.9	— 6.3	— 2.0	— 3.9
1,000-5,000	18,300	16,700	— 3.0	— 4.7	— 1.4	— 2.8
5,000-10,000	2,590	2,440	— 1.8	— 4.0	— 0.3	— 2.0
10,000-50,000	2,120	1,950	— 0.5	— 2.7	0.7	— 0.9
50,000 and over	632	618	2.2	0.3	2.8	1.6
Total	381,000	392,000	— 0.6	— 2.8	0.7	— 0.9

[1] Corporations that do not report balance sheets, as well as tax-exempt companies, are excluded. See footnote 2 in the text for a definition of the measures of earnings used here.

Even at the bottom of the trough of the last wave of prosperity and depression large corporations as a whole were not losing money. The rate of earnings in each size group declined from 1931 to 1932, regardless of the measure used, but the group of largest companies (632 in 1931, and 618 in 1932) still remained above the zero mark, even in the low year, 1932.

Of interest is the relationship between size of company and earnings rates, a relationship holding in both years: the smaller the corporation, the lower the rate of earnings. According to Appendix Table I the addition of officers' compensation to net income in 1931 raised the ratio of earnings of the smallest concerns above that of the other groups; but this was no longer true in 1932.

We must bear in mind certain qualifications in interpreting these figures. First, it is natural to expect a shift of unprofitable companies to smaller size-groups as their net assets dwindle; for this reason alone the rates of earnings in these classes tend to be lower. But it is doubtful whether this factor is of great importance. More serious is the second possibility, that small concerns show more or less fictitious deficits on their balance sheets, owing for example to the practice of accruing compensation of officers (for tax purposes), and balancing these accruals by loans from officers and by other means. The net worth figures, therefore, would understate stockholders' equity, and result in an overstatement of rates of loss. The data available do not segregate loans by officers and stockholders from other 'miscellaneous' liabilities, but even if the total of miscellaneous liabilities is added to net worth, the ranking of the rates of earnings is unchanged (although their level is of course modified). Third, deficits may accumulate as a result of several years of losses, wiping out most of stockholders' equity; yet concerns may continue in existence, operating with borrowed capital. In such instances, the rate of loss on capitalization is very large.[3] Since more small business enterprises operate on a narrow equity than do large concerns, the former tend to report these greater rates of loss. But the changes that would be made in Table 3, were we to omit accumulated deficits from capitalization, would not be sufficient to alter the relative ranks of size-groups, nor would the levels of the earnings rates be greatly modified.[4] Fourth, the capital figures are as of the end of the year. The earnings rates of companies with large losses are therefore somewhat exaggerated. If the average amount of capital during the year were used the rates would not be quite as low. Finally, another possibility should be mentioned: corporations with widely held securities (that is, large companies) may, in times of depression, resort to various bookkeeping expedients to maintain an apparent continuity of earnings. The indistinct borderline between charges to capital and charges to current operations makes the use of such expedients possible. But some uniformity of accounting procedure is enforced by the income tax regulations.

On the whole, therefore, the following conclusion seems justified: In 1932, at the low point of the depression, very large corporations were, in the aggregate, still making profits. In that year rates of earnings appeared to be definitely related to size of concern; the smaller the company, the larger (on the average) was the rate of loss.

These facts, it should be stressed, are true of a year of depression. We cannot assume that the same relative earnings positions of large and small concerns existed in 1929. Indeed, to the extent that the great losses, relative to capitalization, suffered by small companies in 1932 were a consequence of operating on a narrow equity, the reverse may easily be true. However, no statistical basis for judgment as broad as that at our disposal for 1931 and 1932 is available for earlier years.

PROFITS BY INDUSTRIAL DIVISION

We turn now to another principle of classification, that based on industry. Earnings rates by industrial groups for the years 1929-33, inclusive, appear in Table 4. (Supplementary data including return to management as well as to capital appear in Appendix Table II.) Rates of return on capitalization for 1929, 1932 and 1933, are charted in Figure 1.

The identity of the industrial groups that gained most in the upturn from 1932 to 1933 is a striking feature of the chart and table. Only four industries—mining, public utilities and transportation, tobacco products, and finance and real estate—declined in this period in respect of earnings rates. The first two fell only fractionally, however, and final data for 1933 may reveal no declines whatever.[5] The tobacco products group remained at a high level even after the decline in its earnings. All other industries either increased their rates of earnings in 1933, or decreased their losses.

Among corporations manufacturing textiles and leather and leather products, especially, the rises were phenomenal. In both these industries the rates of return on stockholders' equity in 1933 were higher than in 1929. This, as would

[3] See R. C. Epstein, *op. cit.*, p. 463; also pp. 572-5.

[4] This would also be true if we were to subtract such sources of income and loss as dividends received from other companies and loss on sale of capital assets. If we do so, to approximate the return from 'operations', the average net income of large companies with assets exceeding 50 million dollars is transformed into a slight loss (—0.4 per cent on capitalization). Net profits (including interest on fixed indebtedness) remain positive, however.

[5] Corporations with fiscal years ending in 1934 and therefore with greater net profits will be included. Further, more stringent requirements as to depreciation charges may cause some income accounts to be revised upwards.

TABLE 4

RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES, 1929-1933
CLASSIFIED BY INDUSTRY[1]

(*in percentage form*)

INDUSTRIAL GROUP	RATIO OF NET INCOME TO CAPITALIZATION[2]					RATIO OF TOTAL PROFITS TO TOTAL CAPITAL[2]				
	1929	*1930*	*1931*	*1932*	*1933**	*1929*	*1930*	*1931*	*1932*	*1933**
Mining and quarrying[3]	2.9	0.0	—2.8	—2.8	—2.9	3.2	0.6	—1.8	—1.8	—1.9
Manufacturing	8.6	2.7	—1.0	—3.6	0.7	8.3	3.0	—0.3	—2.6	1.2
Construction	7.8	5.7	—0.9	—7.8	—4.6	7.4	5.6	0.3	—5.2	—2.6
Public utilities and transportation	6.5	4.0	2.3	0.7	0.6	5.6	4.1	3.1	2.2	2.1
Trade	5.1	—0.5	—4.4	—7.2	—0.3	5.2	0.0	—3.3	—5.9	0.4
Service	4.3	2.0	—2.2	—10.0	—7.6	4.6	3.0	0.2	—3.2	—1.8
Finance and real estate	5.8	1.8	—1.5	—3.8	—5.2	5.7	2.6	0.2	—1.5	—2.6
Grand total[4]	6.6	2.4	—0.7	—2.9	—1.2	6.2	2.9	0.7	—0.9	0.4
MANUFACTURING SUBGROUP										
Foods, beverages and tobacco products	8.1	6.6	4.2	2.3	5.4	7.8	6.5	4.4	2.7	5.4
Foods and beverages	....	....	2.5	0.3	5.2	....	....	2.9	1.0	5.3
Tobacco products	....	....	13.5	13.1	6.5	....	....	12.8	12.6	6.4
Textiles and products	3.0	—6.0	—6.4	—8.0	3.1	3.1	—5.3	—5.7	—7.2	3.2
Leather and products	3.9	—3.2	—5.0	—6.6	4.4	4.0	—2.9	—4.5	—6.1	4.4
Rubber products	2.5	—4.5	—2.5	—4.2	1.1	3.2	—2.2	—0.6	—2.0	2.1
Forest products	2.5	—4.6	—8.3	—10.3	—3.1	2.7	—3.6	—6.8	—8.4	—2.1
Paper, pulp and products	6.5	2.9	—0.5	—3.4	0.6	6.3	3.3	0.4	—1.9	1.4
Printing and publishing	12.1	8.0	2.4	—1.4	0.9	11.1	7.6	2.9	—0.4	1.5
Chemicals and allied products	10.3	5.2	1.1	0.4	1.7	9.8	5.2	1.6	0.9	2.1
Stone, clay and glass products	6.4	1.8	—2.0	—6.1	—1.4	6.3	2.2	—1.2	—4.7	—0.6
Metals and products	11.1	3.4	—2.0	—6.4	—1.6	10.7	3.6	—1.3	—5.2	—0.9
Total manufacturing[4]	8.6	2.7	—1.0	—3.6	0.7	8.3	3.0	—0.3	—2.6	1.2

*Preliminary estimates.

[1] Tax-exempt corporations and life insurance companies are excluded.

[2] Book values are as of the end of the year; for 1933, 1932 values have been used. *Statistics of Income for 1932* confirms the fact, indicated in the 1931 volume, that the capital of corporations not reporting balance sheets is of small magnitude; no estimate of it was therefore deemed necessary: hence the slight differences between the rates shown here for 1929 and 1930 and those published in *Bulletin No. 50*. The figures for 1931-33 refer only to corporations reporting balance sheets.

[3] The accepted methods of computing depletion charges tend to understate the income of mining companies.

[4] Includes corporations not distributed among the groups shown. The number is relatively small.

be expected, is partly the result of a decline in net worth due to previous losses as well as to failures and voluntary liquidations. Further, neither of these industries was in a really prosperous condition in 1929. Nevertheless, the rise from 1932 of over 10 points (measured in percentages of capitalization) is substantial. Companies engaged in trade and in the manufacture of forest products also showed large favorable changes, but in the form of decreases in rate of loss, not sufficient to lead to a net profit.

Of the four industries still making profits in 1932 two suffered declines. The durable goods industries (lumber, stone, metals and construction) remained below the zero line, although their earnings positions, relative to the preceding year, were enhanced.

In 1933, but three manufacturing industries were 'in the red'. Of the major industrial groups only manufacturing and public utilities showed a profit, however, while the group of trading corporations was close to the zero line.[6]

[6] Since the 1933 figures are preliminary estimates slight differences are of doubtful significance.

In terms of earnings on total capital (including bonded debt and mortgages) the picture is much the same. The relative position of the public utility group is of course improved. If we add compensation of officers to earnings (see Appendix Table II), to approximate a measure of return to both capital and management as well as to correct for under-reporting of profits by small concerns (which are more numerous in certain industries), relative positions are again changed somewhat. This is especially true of construction, trade, printing and publishing, and other industries in which small concerns predominate and in which the personal element is relatively important. Unfortunately, compensation of officers in 1933 is not yet available.

The figures for narrower industrial groupings than those given in Table 3 are not published in complete form. It is possible only to record the presence or absence of a statutory net income or deficit (net income as defined here, before taxes, less tax-exempt interest and dividends received) for certain minor groups for the period 1929-32. Net deficits for each of these four years were reported for the following groups:

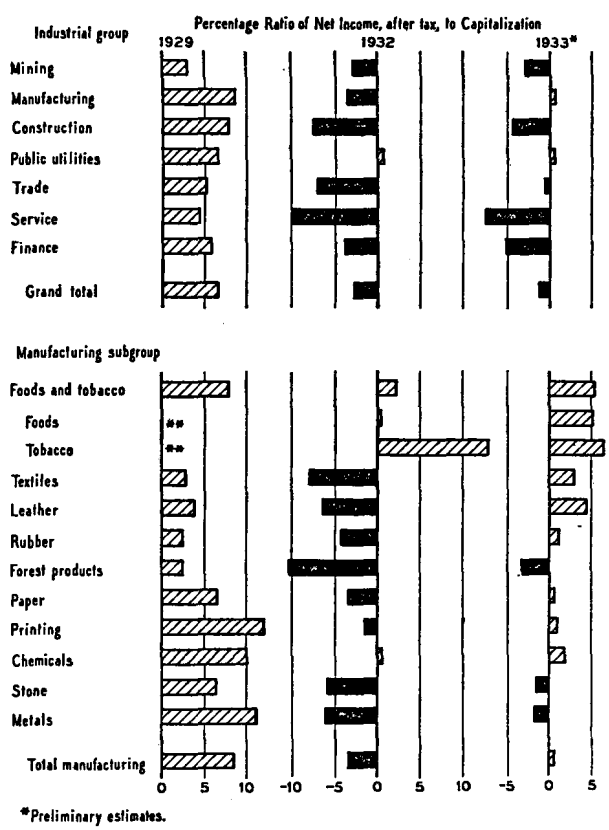
Coal mining: bituminous, lignite, and peat
Woolen and worsted goods
Finishing and tanning leather, and miscellaneous leather products
Radios: complete or parts
Aerial transportation
Amusements: theatres, legitimate, vaudeville, etc.
Joint-stock land banks

Net incomes were reported for each year, 1929-32, inclusive, for the following groups:

Food products: bakery and confectionery products
Mill products: bran, flour, feed, etc.
Beverages: soft drinks, cereal beverages, wines, distilling
Other food products: artificial ice, butter substitutes, cereals, coffee, etc.
Tobacco products
Chemicals proper: acids, compounds, etc.
Allied chemical substances: drugs, oils, paints, etc.
Electric light and power companies
Gas companies, artificial and natural
Telephone and telegraph companies
Water companies

Because of possible shifts in classification, it is not advisable to attempt to add together the data for different years.

Figure 1
RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES



*Preliminary estimates.
**Not available.

All that can be shown here is the continuous presence or absence of a deficit. The possibility of one good year making up for three or four bad years must, however, be remembered.

Among the public utilities, steam railways appear in an unfavorable position, in contrast to other subgroups. Information published by the Interstate Commerce Commission indicates that the net income of Class I steam railways was negative in 1932 and close to zero (on the negative side) in 1933.

TABLE 5

RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES, 1933 AND 1934
BASED ON PUBLISHED REPORTS OF 840 COMPANIES[1] CLASSIFIED BY INDUSTRY

INDUSTRIAL GROUP	PERCENTAGE COVERAGE[2]	RATIO OF NET INCOME TO CAPITALIZATION,[3] IN PERCENTAGE FORM	
		1933	*1934*
Mining	8.4	1.1	4.4
Manufacturing	27.0	3.2	4.6
Trade	8.4	10.5	11.5
Service	12.3	—0.4	2.7
MANUFACTURING SUBGROUP			
Foods	35.4	5.6	6.2
Tobacco products	59.5	9.7	11.7
Textiles and products	18.9	3.7	0.5
Leather products	27.8	6.9	8.0
Rubber products	43.7	3.6	3.6
Paper and pulp	10.9	1.0	4.4
Chemicals and allied products	13.3	6.3	8.1
Metals and products	38.0	0.5	2.4

[1] Compiled by the National City Bank.
[2] The net worth of corporations in the sample, at the beginning of 1933, as a percentage of the net worth of all corporations in the same industrial group.
[3] Book values are as of the beginning of the year.

Data concerning earnings of all corporations during 1934 are not yet available. We may, however, turn to current compilations of the reports of large companies, recognizing that they form a selected group, and that their earnings rates throw light not on the levels of rates of return of all corporations but on the direction of movement of these rates. The earnings rates are presented in Table 5, together with a measure of the degree to which each industry is covered. The industrial groups given have been made to correspond, as far as possible, to those in Table 4.

The net incomes of all groups rose from 1933 to 1934, with but two exceptions. The published statements of textile companies revealed a severe decline in income, a decided contrast to the movement from 1932 to 1933. Rubber manufacturers experienced no appreciable change in profits. The earnings of certain industrial divisions not represented here, notably the public utilities, decreased between 1933 and 1934.

While the sample in Table 5 is of limited value in indicating earnings of all corporations in the United States,

it is possible to state with confidence that 1934 was a more profitable year than 1933. Certainly, 1934 was less unprofitable than 1933. But the rate of improvement between 1933 and 1934 was not as great as that between 1932 and 1933. A definite slowing up is revealed by the annual data. This fact is confirmed by reference to available quarterly statistics of profits. The last two quarters of 1933 were barely surpassed in 1934.

PROFITS BY SIZE AND BY INDUSTRY

We may now combine the two principles of classification previously used, and contrast earnings of large and of small concerns within the same industry. The necessary information is available only for 1931 and 1932 and for one earnings ratio, that of net income (before tax, in this case) to capitalization. The figures for 1932, the low point, are summarized in Table 6.[7]

With some exceptions, the average rate of earnings generally improves as the size of company increases. Indeed, in several industries in which the composite rate of return is negative that for large companies is positive. (The period covered, it must be repeated, was one of severe depression.)

In the comparison of small companies as a group with large companies as a group, such as was made in Table 3, we were not concerned with variation in average size of corporation from industry to industry. But if we wish to concentrate, as in Table 6, on the relation of size to profitability with the effects of industrial differences eliminated, it is pertinent to inquire whether the industrial groups are homogeneous. That is, do the broad classifications used here, by confining comparisons to the companies within groups, make differences in rates of return due to size alone stand out? For many purposes the homogeneity of these groups may probably be questioned. On the other hand, there is sharp contrast in the character of large- and small-scale enterprise. Different personal elements are involved; operations of large companies are more extensive and include more different kinds of business than those of small firms. Small concerns are articulated in the economic system differently than are large companies. In short, 'industry' and size are definitely related. Any narrow definition of 'industry' leaves no room for both small and large companies in the same industrial group. On the whole, therefore, while the industrial groupings available for use here are wide, they aid in eliminating at least some forces acting alike on large and small companies within the same group. Yet the contrast in earnings rates of large companies to those of small concerns persists to a considerable degree. It may be doubted, therefore, whether the element of heterogeneity involved in the wide industrial groups used here vitiates our conclusion. Size of concern appears to have been related, on the average, to rate of return on stockholders' equity, at least in the depression year 1932. (This was true also in 1931.)

[7] It is unnecessary to give the figures for 1931 since they, together with other financial and operating ratios by size groups, have been analyzed in detail by W. L. Crum: *The Effect of Size on Corporate Earnings and Condition* (Harvard University, Business Research Studies, No. 8, June 1934).

TABLE 6

NET INCOME, BEFORE TAX, AS A PERCENTAGE OF CAPITALIZATION, 1932
CORPORATIONS CLASSIFIED BY SIZE AND INDUSTRY

(size is measured by total net assets, in thousands of dollars)

INDUSTRIAL GROUP	UNDER 50	50-100	100-250	250-500	500-1,000	1,000-5,000	5,000-10,000	10,000-50,000	50,000 AND OVER	CLASSES GROUPED[1]	1,000 AND UNDER	OVER 1,000	TOTAL
Mining and quarrying	—52.0	—10.3	— 6.2	— 4.0	— 3.4	—1.9	—1.8	—1.5	—2.8	....	— 6.0	—2.2	— 2.7
Manufacturing	—35.5	—16.1	—11.3	— 8.6	— 6.6	—5.5	—3.8	—3.9	0.0	....	—11.0	—2.1	— 3.3
Construction	—43.3	—19.0	—12.8	— 9.2	— 6.3	—0.8	....	....	....	2.0	—15.6	0.7	— 7.4
Public utilities and transportation	—18.8	— 7.7	— 3.1	— 2.2	— 5.7	0.6	0.0	1.6	1.1	....	— 6.1	1.1	1.0
Trade	—30.0	—14.2	—11.1	— 8.4	— 6.5	—5.0	—1.8	—0.9	3.3	....	—13.0	—1.3	— 6.9
Service	—40.5	—24.4	— 8.5	— 5.9	— 6.6	—8.4	—8.6	....	....	—8.2	—12.8	—8.3	— 9.8
Finance and real estate	—31.1	— 8.6	— 7.7	— 5.8	— 5.8	—4.5	—5.5	—2.6	1.1	....	— 7.8	—2.0	— 3.2
Grand total[2]	—32.8	—13.8	— 9.7	— 7.1	— 6.1	—4.6	—3.8	—2.4	0.5	....	—10.4	—1.2	— 2.6
MANUFACTURING SUBGROUP													
Foods and beverages	—20.1	— 9.2	— 6.9	— 2.7	— 1.0	—0.5	0.1	—0.7	5.8	....	— 5.4	2.1	0.8
Tobacco products	—25.4	— 4.8	— 1.1	— 3.0	— 4.7	4.0	....	....	....	16.5	— 4.3	15.6	15.1
Textiles and products	—50.2	—21.6	—13.3	— 8.9	— 7.6	—5.6	—8.2	....	....	—5.2	—13.4	—5.9	— 7.9
Leather and products	—45.2	—19.8	—11.6	—13.1	—10.5	—7.6	—8.6	....	....	3.3	—14.5	—2.9	— 6.2
Rubber products	—37.3	— 7.0	—13.2	— 4.9	....	....	....	....	....	—4.0	....	....	— 4.2
Forest products	—53.9	—26.9	—19.1	—17.2	—12.3	....	....	....	....	—6.9	—18.4	—6.9	—10.2
Paper, pulp and products	—28.2	—10.7	— 7.0	— 4.7	— 2.3	—4.4	—1.5	....	....	—2.7	— 5.4	—3.0	— 3.3
Printing and publishing	—26.1	—13.1	— 6.2	— 2.0	— 1.3	0.1	5.6	....	....	1.0	— 7.2	1.5	— 1.0
Chemicals and allied products	—24.6	— 8.6	— 5.4	— 1.7	0.2	2.5	2.0	0.3	0.7	....	— 3.8	0.8	0.6
Stone, clay and glass products	—35.1	—15.0	—12.1	—11.0	— 7.6	—6.9	—5.5	....	....	—2.7	—11.8	—4.3	— 5.9
Metals and products	—40.1	—18.2	—14.4	—12.2	— 9.7	—9.7	—6.9	—7.5	—3.5	....	—13.7	—5.4	— 6.3
Total manufacturing[2]	—35.5	—16.1	—11.3	— 8.6	— 6.6	—5.5	—3.8	—3.9	0.0	....	—11.0	—2.1	— 3.3

[1] Classes grouped to conceal data reported and identity of corporation.

[2] Includes corporations not distributed among the groups shown. The number is relatively small.

DIVIDEND PAYMENTS AND CORPORATE SAVINGS

The decline in profits and the appearance of losses did not, of course, affect dividend payments immediately. The natural lag, and the fact that not all companies suffered losses, helped to sustain the stream of dividend payments even though the reservoir from which they flowed was not replenished, in the aggregate. In an effort to take care of holders of common stock as well as those of preferred stock, even concerns that suffered losses continued to declare and pay dividends. The savings of the preceding years of prosperity were drawn upon.

The figures for the recent period appear in Table 7.

TABLE 7

DIVIDEND PAYMENTS AND ANNUAL CORPORATE SAVINGS IN THE UNITED STATES
1929-1933

(*in millions of dollars*)

YEAR	NET INCOME BEFORE PAYMENT OF DIVIDENDS BUT AFTER PAYMENT OF INCOME TAXES[1]	NET CASH DIVIDENDS PAID[2]	ANNUAL CORPORATE SAVINGS (UNDISTRIBUTED NET INCOME)[3]
1929	7,950	5,780	2,170
1930	1,260	5,660	—4,400
1931	—3,240	4,200	—7,440
1932	—5,470	2,640	—8,110
*1933**	—2,520	1,950	—4,470

*Preliminary estimates.

[1] See Table 1; also footnote 2 to that table.

[2] The 1933 figure has been estimated from reports of large companies.

[3] Figures for the period 1919-28 appear in *Bulletin 50*, p. 10.

The corporate saving shown is of course a net figure. Although it was negative from 1930 through 1933 (and there is some evidence that it was negative also in 1934), some corporate earnings were saved. Even in 1932 at least some $130,000,000 were accumulated by corporations with net income.[8]

The situation revealed is a dark one. In the aggregate, the drain in the form of losses and dividends for the period 1930-33 exceeded the corporate savings of the entire post-War decade. But some corporations suffered less than others. In particular, if the large companies in which dividends are the chief means of distributing profits are considered separately, the draught upon surplus and capital does not appear so great.[9] This is true also of the aggregate if losses on the sale of intercorporate security holdings are not included.

BUSINESS ASSETS IN PROSPERITY AND DEPRESSION

The large draught upon capital and surplus in the years since 1929 has left its imprint upon the balance sheets of American business. It is interesting to trace the effect, upon the condition and assets of business enterprise, of the changes recorded in corporate income accounts. We confine ourselves to the total, omitting the finance, real estate and service groups;[10] lack of space as well as shifts in classification make possible only incidental reference to the balance sheets of individual industrial groups.

The aggregate balance sheet of American corporations, excluding the groups mentioned, appears in Table 8. (Besides the dollar figures, relative numbers on the 1929 base are presented.) Our interest lies here chiefly in the asset side of the statement: the liabilities and capital items are given to complete the picture. Cash declined 1.4 billion dollars from 1929 to 1932; receivables, 7.6 billion; inventories, 8.7 billion; capital assets, 6.5 billion. Investments and miscellaneous assets were reduced by but 2.0 billion. On the other side of the balance sheet, current liabilities declined 5.9 billion dollars; long-term debt remained almost constant; and miscellaneous liabilities fell 2.9 billion dollars. The difference between these changes in assets and liabilities (17.5 billion dollars) was absorbed by capital, including surplus.

The uneven movements of these values arouse interest. What are the factors making for different degrees of change in the various assets of American business?

We would expect the total assets of business enterprises to decline simply because of the drain upon resources arising from losses and sustained dividend payments. Another important reason would be the liquidation of debts, especially short-term obligations to banks and other creditors. But not all assets could be expected to reflect this drain equally. Besides the conditioning elements originating in differences in liquidity and in business policy, the distribution of capital among different assets would be influenced also by price movements and by changes in the volume of production. The possibility of technological change (change in the technical ratio of equipment to stocks of goods and to number of employees), and the resulting changes in the

[8] This is the annual savings of corporations with statutory net income. It understates the annual savings of all corporations with savings in 1932, because of negative savings of some corporations with statutory net income.

[9] The Standard Statistics Company publishes data for 418 large industrial corporations. The figures, with 1927 and 1928 included for purposes of comparison, follow:

	NET INCOME LESS CASH DIVIDENDS (*millions of dollars*)
1927	565
1928	1,087
1929	1,218
1930	—11
1931	—761
1932	—809
1933	—63

[10] It is desirable to omit realty concerns, banks and other financial institutions from the present discussion. Owing to certain changes in classification this makes it necessary, also, to exclude service companies.

TABLE 8

AGGREGATE BALANCE SHEET, 1929-1932
ALL CORPORATIONS OTHER THAN FINANCE, REAL ESTATE AND SERVICE COMPANIES[1]

	(*in millions of dollars*)				(*as percentages of 1929*)			
	1929	*1930*	*1931*	*1932*	*1929*	*1930*	*1931*	*1932*
Assets								
Cash	7,460	7,513	6,283	6,106	100.0	100.7	84.2	81.8
Notes and accounts receivable (net)	21,849	19,831	16,829	14,281	100.0	90.8	77.0	65.4
Inventories	20,799	18,070	14,692	12,077	100.0	86.9	70.6	58.1
Capital assets (net)	94,813	98,322	93,947	88,307	100.0	103.7	99.1	93.1
Investments								
Tax-exempt	2,913	2,572	2,561	2,677	100.0	88.3	87.9	91.9
Other[2]	39,400	40,140	34,586	26,246	100.0	101.9	87.8	94.9
Miscellaneous assets				11,157				
Total	187,234	186,448	168,898	160,851	100.0	99.6	90.2	85.9
Liabilities and capital								
Notes and accounts payable	19,845	18,268	15,411	13,954	100.0	92.1	77.7	70.3
Bonded debt and mortgages	34,944	37,485	35,465	34,907	100.0	107.3	101.5	99.9
Miscellaneous liabilities	15,368	14,436	11,982	12,464	100.0	93.9	78.0	81.1
Capital stock								
Preferred	15,352	14,793	15,166	15,200	100.0	96.4	98.8	99.0
Common	63,705	64,461	59,734	59,576	100.0	101.2	93.8	93.5
Surplus and undivided profits less deficit	38,020	37,005	31,140	24,750	100.0	97.3	81.9	65.1
Total	187,234	186,448	168,898	160,851	100.0	99.6	90.2	85.9

[1] Excluding tax-exempt corporations and companies not reporting balance sheets.
[2] Figures for 1929-31 are not given here since there is evidence that some investments were not separated from miscellaneous assets in the earlier reports.

relative and absolute values of different assets, must also be remembered; no facts relating to this point may be adduced in this *Bulletin*.

Differences in liquidity are important in a consideration of the changes revealed in Table 8. Turnover rates (or average life of assets) differ from one kind of asset to another and from one industry to another, and condition the rate of liquidation. The liquidity of capital assets in the economy as a whole, for example, is indicated partly by the ratio of depreciation and depletion charges to the net book value of capital assets. Contrast the value of this figure, a few per cent per annum in the case of capital assets, to the turnover rates of stocks of goods, which run to several hundred per cent per annum. On the other hand, replacements also affect the relative proportions of the different assets in the aggregate balance sheet under review. In the case of fixed assets, certain repairs and replacements are essential if a plant is to be kept in operation, even at a low rate. Inventories must be carried, if business is to be done at all. But the extent of replacement fluctuates, depending on forecasts of the future, as well as on the current volume of production. (The value of replaced assets will change, further, because of price movements.)

New investments must also be considered in analyzing the changes recorded in Table 8. Not all corporations lost money, even in 1932. But the new capital derived from security flotations declined rapidly in recent years, while total corporate savings were negative. According to compilations of the Standard Statistics Company, new-money issues declined from 3,668 million dollars in 1929 to 321 million in 1932. Even if these be stepped up substantially in order to include the financing of small companies not floating public issues, the net result, after subtracting negative corporate savings, is a decline in invested capital. In the face of this lessening of means new investment could not persist at old levels, and even replacements could not, in many instances, be made. Further, the desire to make such commitments waned.

Changes in the value of unliquidated assets may occur also. Book values of capital assets may be written down to take cognizance of obsolescence and of changes in price levels. In the event of receivership and reorganization this process would be forced. But in many instances it may result from a voluntary admission of the facts.

Failures followed by withdrawal from business would result in declines in the value of different assets reported by all corporations, including fixed assets. But while withdrawals were numerous, their importance in terms of assets or capital, or even liabilities, was not so great. The Dun and Bradstreet figures provide information on the last item, for commercial establishments.[11] For the years 1929-32,

[11] Failures or other retirements from business with no loss to creditors are not covered by the Dun and Bradstreet compilations. No reliable evidence is available concerning these voluntary retirements from business. Indeed, no reliable figures are available as to the number of business concerns in the United States for a series of years, or even for one year. While the number of corporations reporting to the Bureau of Internal Revenue declined but slightly, in the total or in the various industrial groups,

inclusive, liabilities of failing commercial concerns amounted to 2,815 million dollars. As percentages of total corporate liabilities (current and fixed) of similar industrial groups, the figures are: for 1929, 1.8 per cent; 1930, 2.6 per cent; 1931, 3.2 per cent; and 1932, 4.1 per cent. These percentages, it must be remembered, overstate the correct figures since liabilities of corporate enterprises alone appear in the denominators. Also, if 1929 failures are taken to be 'normal', only part of the failures in 1930-32 may be ascribed to forces resulting from the depression. This would reduce the 1932 figure, for example, to 2.3 per cent.[12]

Large companies that suffer insolvency and receivership do not ordinarily go out of business. They are reorganized, usually with revaluation of assets. The magnitude of these failures may be indicated by analysis of published reports. Of 492 large industrial companies whose records were examined, 27 fell into receivership in the period 1931-34,[13] and 12 others defaulted on fixed indebtedness. The companies in receivership owned 3.0 per cent of the invested capital of the 492 companies in 1929, and the defaulting companies 2.1 per cent, 5.1 per cent altogether.

Some instances of voluntary write-down, not accompanied by insolvency, exist. The available evidence, as we shall see, indicates that this form of response, while it resulted in deductions of several billion dollars in the aggregate, could not be expected, in itself, to result in great modification of balance sheet values.

Current stocks of commodities may also be revalued to correspond to market conditions. Reserves for inventory-decline may be set up; and inventories may be valued at market when market prices are lower than cost. The last-mentioned practice is widespread: of 334 companies with available reports, 276 valued their commodity stocks at the lower of cost or market price.[14]

The net results of all these changes in value and quantity of assets are reflected in the aggregate balance sheet appearing in Table 8, which we may now examine in more detail.

Public utilities were chiefly responsible for the rise in capital assets from the end of 1929 to the end of 1930. For them especially, 1930 was still a good year, and the momentum of long-term planning and capital investment continued into the first year of general recession. By the end of 1931 a net decline in the capital assets of all corporations had been recorded, however, and this continued into 1932.

The decline of ten billion dollars in the two-year period from 1930 to 1932 was relatively small—about ten per cent of total capital assets in 1930. Yet the fall in book value of capital assets exceeded depreciation and depletion charges,[15] although if account be taken of new investment

this may be due to the lag between economic retirement and the legal winding-up of corporate affairs. The number of partnerships has declined, but this appears to be part of the trend noticeable before 1929. The number of concerns on the Dun and Bradstreet list (which includes corporations and partnerships) fell 11 per cent from 1929 to 1933. (A rise from 1933 to 1934 is revealed by this series.) Census data on number of establishments and stores do not correctly represent the changes in number of business enterprises, chiefly because of varying percentage coverage from year to year. The available figures are assembled below. Only net changes in number of enterprises are indicated by these data. The last line of figures duplicates, of course, some of the corporations and partnerships.

NUMBER OF BUSINESS ENTERPRISES IN THE UNITED STATES
(in thousands)

	1929	*1930*	*1931*	*1932*	*1933*	*1934*
Active corporations reporting to the Treasury Department						
a. including subsidiaries	486	495	491	481		
b. excluding subsidiaries	456	463	460	452	443	
Partnerships reporting to the Treasury Department	264	245	230	217		
Commercial concerns listed by Dun and Bradstreet	2,213	2,183	2,125	2,077	1,960	1,975

[12] Liabilities, of course, do no more than roughly suggest the magnitude of the losses to holders of equities or to creditors. Some indication of credit losses, as they are suffered by corporations, is given by the bad debts charged off. For all corporations this was 900 million dollars in 1929, and 1,300 million in 1932, an increase of 400 million. If we substract trading and service corporations, in an effort to eliminate bad debts incurred in retail trade, the figures for corresponding years are 700 and 1,000 million. The increase in losses on short-term credit, it would seem, was not large, relative to the volume of bad debts in a prosperous year such as 1929.

[13] It is interesting to compare these figures with those of Dun and Bradstreet for commercial concerns in general. The failure rate in the latter group was 1.3 per cent in 1931, 1.5 in 1932, 1.0 in 1933, and 0.6 in 1934. For the 492 large companies, the corresponding rates were: 1931, 0.4 per cent; 1932, 1.8 per cent; 1933, 2.2 per cent; 1934, 1.0 per cent. (The sample of large companies is perhaps insufficient to constitute an adequate basis for generalization.)

[14] Data compiled by the Statistical Division of the American Telephone and Telegraph Company. The bearing of this practice upon the recording of profits must be mentioned. In a year in which prices turn downwards, such as 1929, reported profits of all corporations would be lower by several hundred million dollars than if inventories had been valued at cost. Conversely, in a year such as 1933, reported profits would be higher.

[15] Depreciation and depletion charges, 1931-32, were reported as follows, in millions of dollars.

	ALL CORPORATIONS OTHER THAN FINANCE, REAL ESTATE AND SERVICE COMPANIES	
	depreciation	*depletion*
1931	3,460	260
1932	3,170	240

and replacement, there would be no such excess. It is apparent, then, that some of the decline in value of fixed assets was due to deductions other than those for wear and tear and depletion. These consisted chiefly of 'write-offs' and 'write-downs', together with such items as losses on sale of capital assets, retirement and abandonment of property, and losses due to accidental destruction. (Some reduction in value resulted also from the replacement of retired equipment at prices lower than former book value.)

Besides the difference between the decline in value of capital assets and charges for depreciation and depletion, we find that an additional sum of some six billion dollars, for purchases of new capital goods, must be accounted for by 'other' deductions.[26] If we add this figure to the three billion dollar decline in capital assets unaccounted for by depreciation and depletion charges (ten billion less seven billion) we have a sum close to nine billion, which we must remember probably somewhat overstates the correct figure.[27] This is the amount that represents 'write-offs' and 'write-downs' for 1931 and 1932, as well as types of capital attrition not included under depreciation charges. The result is not only that originating in voluntary revaluation, but also that due to forced changes in value arising from failure and reorganization.

Write-downs and write-offs, in dollars, reached a large figure. But relative to the degree of fall in prices, and to the amount of obsolescence probably uncovered during the depression, the amount does not seem great. (Another element to be considered is the upward revaluation of assets made in the preceding period of prosperity.) There is reason for this apparent inertia. For one thing, government tax policy has made difficult any write-downs exceeding 'normal' depreciation charges. For another, uncertainties concerning the future course of the price level have caused business men to hesitate before accepting depression prices as permanent. An important factor making possible this hesitation may be the organization of a considerable portion of American business in large units. Great enterprises are powerful enough to withstand even a severe depression without giving way completely and without radical reorganization of book values and of policies.[28]

Recognition of losses, through revaluation, might have had some beneficial effects. The psychological state of business men would have been improved. And from the point of view of accounting, some confusion of capital with current charges would have been avoided: present and future profits history would be different. But that current replacement costs, obsolescence, and other developments were recognized to some extent, we here have evidence. The degree to which the atmosphere was thereby cleared we can only surmise.

Let us turn to the other assets listed in Table 8. The decline in cash from 1929 to 1932 was surprisingly small, only 18 per cent. (Banks, it must be remembered, are excluded.) Other current assets, of course, fell, as a result of the decline in prices and in volume of business. While receivables (notes and open accounts) exceeded notes and accounts payable by two billion dollars in 1929, the balance was but a seventh of that figure at the end of 1932. Inventories did not fall proportionately to the volume of business; consequently, turnover rates declined. (This was true in every industrial group except one, textiles.)

Working capital, taken as the difference between current assets (cash, notes and accounts receivable, inventories, and tax-exempt investments) and current liabilities (notes and accounts payable), declined considerably (34 per cent from 1929 to 1932). This was also true, in greater or lesser degree, of each industrial group. The liquidation of fixed capital could not proceed more rapidly than these goods could be consumed. (The possibility of transfer to non-corporate enterprise may be ignored.) Buildings, machinery, furniture and fixtures—these are not *current* assets. It is apparent therefore that the drain upon working capital due to losses and dividend payments could not be replenished by the depreciation fund. Nor, indeed, was the entire depreciation fund available for such a purpose. Cer-

[26] Of the nine billion dollars of new capital goods made in 1931 and 1932 for business purposes (Table 10, *Bulletin 52* of this series) we may estimate roughly that 65 per cent was purchased by corporations other than those of the finance and service group. (This figure is the ratio of depreciation charges of these companies to total business depreciation.) This amounts to six billion, and may be an overstatement: government purchases as well as some tools and materials normally charged to repairs and renewals are not completely eliminated; and the ratio based on depreciation charges is perhaps larger than the correct proportion.

[27] Reference to changes in net worth of all companies, after allowing for new security issues and draughts due to negative corporate savings, confirms roughly the order of magnitude of this figure.

[28] That very large companies did not, in fact, revalue their assets even to the extent indicated above is suggested by figures compiled by the Standard Statistics Company from the reports of 418 major industrial companies. Debit adjustments of surplus (which include items besides revaluation, and also include stock dividends, and therefore overstate write-downs) were as follows, in millions of dollars. (Data for 1927 and 1928 are given for purpose of comparison.)

YEAR	SURPLUS DEBITS	TOTAL ASSETS (END OF YEAR)
1927	584	27,998
1928	512	29,778
1929	625	32,218
1930	324	32,261
1931	678	30,520
1932	527	28,267
1933	391	27,837

tain forms of replacement and repairs cannot be foregone, if the plant is to be kept even in partial operation. The decline of 12 billion in working capital from 1929 to 1932 was therefore a natural consequence. But since prices were low, and the volume of business small, less working capital was in fact required. Indeed, since the figures shown here are aggregates, it is obvious that in many companies the portion of working capital accumulated as a reserve may have actually increased. But in any event working capital, in the form of liquid assets, was insufficient to finance the requirements that an upturn would bring. The major portion of new working capital lay nascent in the fixed assets of all corporations; the credit-making mechanism of our banking system was needed to quicken it into life.

Long-term debt—bonds and mortgages—changed very little from 1929 to 1932. Since fixed assets fell, the ratio to them of long-term debt rose. This occurred in most industrial groups, including those in which long-term debt bulks large.

Little can be said about miscellaneous assets and liabilities, since they include a considerable amount of intercorporate holdings and debts. Miscellaneous assets include also intangibles and deferred charges, while miscellaneous liabilities cover miscellaneous reserves, and deferred and suspense items.

What was the picture at the end of 1933? In the absence of data covering all corporations, some remarks may be hazarded on the basis of published reports of large companies. Figures for 535 industrial corporations, compiled by the Standard Statistics Company, reveal the following changes between 1932 and 1933:

	PERCENTAGE CHANGE
ASSETS	1932 TO 1933
Cash and equivalent	— 5.9
Receivables	+ 1.0
Inventories	+10.8
Property accounts (net)	— 4.1
Investments	+ 2.1
Intangibles	— 7.6
Other fixed assets	— 5.2
Total	— 1.6
LIABILITIES	
Current	+15.7
Funded debt	— 6.4
Other liabilities	— 3.9
Preferred stock	— 2.2
Common stock and surplus	— 1.7
Capital reserves	— 1.4
Total	— 1.6

Fixed capital assets appear to have declined further, in spite of the up-turn in volume of business. On the other hand, the value of stocks of goods rose rapidly. Net working capital, however, changed but fractionally. One interesting item not available for all corporations, intangibles, fell by more than seven per cent—a decline greater than that of any other asset. The rise in receivables, only one per cent, is in contrast to the large increase of 16 per cent in current liabilities. With dividend payments still exceeding net income, net worth declined slightly.

SUMMARY

At the bottom of the depression, in 1932, only four industries were making profits: public utilities, foods, tobacco products, and chemicals. In all industrial groups in that year small corporations were relatively worse off, on the average, than large companies.

The deficit accumulated during the years of depression had its effect upon the capital, assets, and condition of American corporations. Failures, reorganizations and write-downs mounted as profits fell and losses rose. But in contrast to the severity of the recession the extent of readjustment manifested through insolvencies and revaluations seems small. There are indications here of an important element of inertia, the influence of which must find a place in any explanation of the events of the last few years.

The rise from 1932 to 1933, while not eliminating losses in the aggregate, placed many manufacturing groups on a profitable basis, and decreased the deficits of other industries. The earnings of but four industries were lower in 1933 than in 1932; and two of these showed profits in both years.

Cash dividends continued to fall. Not until 1934 did these lagging payments reflect the upturn of the preceding year.

In brief, 1932 was definitely the low point in the average earnings of business enterprise. The year 1933, with a few exceptions, showed considerable improvement over 1932 (chiefly in the form of a reduction in losses), and it is probable that 1934 was more favorable. Here are reflected the effects, upon business enterprise, of the interaction between the situation created by the preceding years of decline and the new factors injected into the scene of 1933. While business in the aggregate was not yet on a profitable basis in 1933, or perhaps even in 1934, fears of the end of the profits system must, in the light of the figures, be modified. Industry has always revealed great powers of adaptation and recuperation. What we find today constitutes no exception to this experience.

Other information on profits is contained in INDUSTRIAL PROFITS IN THE UNITED STATES, *by R. C. Epstein ($5), and* CORPORATE PROFITS AS SHOWN BY AUDIT REPORTS, *by W. A. Paton ($1.25), both published by the National Bureau of Economic Research. To the latter volume Mr. Fabricant contributed some sections. He is now working on a study of Capital Consumption.*

BULLETIN *readers may also wish to have cloth-bound*

copies of NATIONAL INCOME, 1929-32 *(Senate Doc. 124, 73d Cong., 2d Sess.). A few of the copies which the National Bureau purchased and had bound for its subscribers remain. These are now available for fifty cents, a price roughly equivalent to the government price plus the cost of binding and postage.*

APPENDIX TABLE I

RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES, 1931 AND 1932 CLASSIFIED BY SIZE OF CORPORATION[1]

SIZE (TOTAL NET ASSETS IN THOUSANDS OF DOLLARS)	NUMBER OF CORPORATIONS		MEASURE OF EARNINGS: NET INCOME PLUS COMPENSATION OF OFFICERS AS A PERCENTAGE OF CAPITALIZATION		MEASURE OF EARNINGS: TOTAL PROFITS PLUS COMPENSATION OF OFFICERS AS A PERCENTAGE OF TOTAL CAPITAL	
	1931	*1932*	*1931*	*1932*	*1931*	*1932*
Under 50	182,000	206,000	5.5	—7.2	5.5	—5.2
50-100	61,100	58,300	3.9	—3.3	4.2	—1.6
100-250	63,400	59,500	1.5	—3.3	2.3	—1.4
250-500	31,100	28,400	0.5	—3.2	1.5	—1.3
500-1,000	19,300	17,600	—0.5	—3.6	0.7	—1.7
1,000-5,000	18,300	16,700	—1.2	—3.2	0.0	—1.5
5,000-10,000	2,590	2,440	—0.7	—3.1	0.5	—1.3
10,000-50,000	2,120	1,950	0.3	—2.1	1.3	—0.4
50,000 and over	632	618	2.4	0.5	3.0	1.7
Total	381,000	392,000	1.2	—1.3	2.1	0.3

[1] Corporations that do not report balance sheets, as well as tax-exempt companies, are excluded.

APPENDIX TABLE II

RATES OF EARNINGS OF CORPORATIONS IN THE UNITED STATES, 1929-1932 CLASSIFIED BY INDUSTRY[1]

(in percentage form)

INDUSTRIAL GROUP	RATIO OF NET INCOME PLUS COMPENSATION OF OFFICERS TO CAPITALIZATION[2]: *1929*	*1930*	*1931*	*1932*	RATIO OF TOTAL PROFITS PLUS COMPENSATION OF OFFICERS TO TOTAL CAPITAL[2]: *1929*	*1930*	*1931*	*1932*
Mining and quarrying[3]	3.6	0.6	—2.3	—2.2	3.8	1.2	—1.3	—1.3
Manufacturing	10.8	4.8	0.9	—1.9	10.3	4.9	1.4	—1.1
Construction	19.6	16.5	8.8	—0.3	16.8	14.4	8.2	0.9
Public utilities and transportation	6.8	4.2	2.6	0.9	5.7	4.2	3.3	2.3
Trade	12.2	6.4	2.1	—1.4	11.6	6.3	2.4	—0.7
Service	9.1	7.0	2.8	—6.2	8.2	6.6	3.7	—1.0
Finance and real estate	7.4	3.3	—0.1	—2.5	7.0	3.8	1.3	—0.5
Grand total[4]	8.7	4.3	1.1	—1.4	7.8	4.4	2.0	0.2
MANUFACTURING SUBGROUP								
Foods, beverages and tobacco products	10.0	8.7	6.2	4.1	9.5	8.3	6.1	4.3
Foods and beverages	....	....	4.7	2.3	....	....	4.8	2.7
Tobacco products	....	....	14.6	13.9	....	....	13.8	13.3
Textiles and products	7.1	—1.8	—2.3	—4.5	7.0	—1.4	—1.9	—3.9
Leather and products	7.9	0.7	—1.1	—3.0	7.8	0.9	—0.9	—2.7
Rubber products	3.8	—3.4	—1.4	—3.3	4.2	—1.4	0.2	—1.3
Forest products	5.4	—1.9	—5.9	—8.2	5.4	—1.2	—4.6	—6.6
Paper, pulp and products	8.6	4.9	1.4	—1.7	8.1	5.0	2.0	—0.5
Printing and publishing	19.0	14.3	7.8	3.2	17.1	13.0	7.5	3.5
Chemicals and allied products	11.2	6.0	1.8	1.0	10.6	6.0	2.2	1.5
Stone, clay and glass products	9.0	4.0	0.0	—4.3	8.6	4.2	0.6	—3.2
Metals and products	13.0	5.0	—0.6	—5.2	12.4	5.1	0.0	—4.1
Total manufacturing[4]	10.8	4.8	0.9	—1.9	10.3	4.9	1.4	—1.1

[1] Tax-exempt corporations and life insurance companies are excluded. Data for 1933 are not yet available.
[2] Book values are as of the end of the year.
[3] The accepted methods of computing depletion charges tend to understate the income of mining companies.
[4] Includes corporations not distributed among the groups shown. The number is relatively small.

National Bureau of Economic Research

BULLETIN 56

MAY 10, 1935

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Aspects of Manufacturing Operations during Recovery

FREDERICK C. MILLS

Copyright 1935, National Bureau of Economic Research, Inc.

I. THE PROBLEM, THE DATA, AND SOME LIMITING CONDITIONS

A SUBSTANTIAL economic recovery has occurred in the United States since the low point of the depression was reached early in 1933. By January-February, 1935, the level of wholesale prices had risen 33 per cent. In manufacturing industries the volume of production had increased 49 per cent, the total number of persons employed had increased 33 per cent, and total wage disbursements had advanced 72 per cent. The evidence of real improvement is unmistakeable, despite the recurrent checks that have been felt from time to time.

Particular interest attaches to the nature of this recovery, because of the novel elements that have played a part in it. The forces operating in the traditional revival have been compounded in complex ways with elements of a consciously formulated program of economic recovery. For this reason it is of particular interest to know whether there have been shifts in the internal processes of recovery, shifts that might be associated with special elements of the recovery program. Again, we may ask whether this recovery has conformed, in general, to the pattern of earlier business revivals. This question is pertinent today not only as a matter of historical interest but also because it bears upon the probable future course of recovery. We may not appraise current economic changes solely with reference to past standards, but reference to these standards may illuminate the present situation.

There are, of course, more specific questions centering about the recovery program, as it affected manufacturing industries. What has been the effect of the novel conditions of 1933-35 upon industrial productivity? How have labor costs in manufacturing plants been affected? How much has the aggregate purchasing power of manufacturing labor been increased? Has this increase differed in important ways from the customary expansion of labor's purchasing power during business revival? These, and the more general questions suggested above, deal with matters of major importance today, when recovery is being sought under an intermixture of old and new conditions. Not all these questions may be answered definitely, but their urgency justifies an attempt to cull from available data evidence relevant to these central issues.

This attempt has been made in preparing the measurements given in this paper. A considerable margin of error is present, for certain items, because of limitations upon the coverage of the original records utilized, or because of imperfect comparability of series drawn from different sources. Recognition of this margin of error, of the type that is present whenever representative data are employed, is necessary in using the detailed figures given below. But the general consistency of the results secured leaves no doubt as to the substantial truth of the evidence drawn from these records.

The records of recovery are to be interpreted, of course, with reference to the background of the preceding recession, as this affected manufacturing industries. Over a period of less than four years the physical volume of manufacturing production had been cut in half, the average selling price of manufactured products had fallen 31 per cent, and the aggregate gross income of manufacturing enterprises had been reduced almost two-thirds. The number of employed wage-earners had fallen approximately 43 per cent, the average hourly wage had declined some 23 per cent, and average earnings per wage-earner had dropped 39 per cent. The total wage disbursements of manufacturing industries had declined 65 per cent, a drop which, corrected for changes in living costs, meant a loss of ap-

proximately 50 per cent in the actual aggregate purchasing power of manufacturing labor. In no recent business recession have equal losses been suffered by manufacturing industries. The price decline of 1920-21 exceeded the drop of 1929-33, it is true, and in other respects the first post-War recession was of a magnitude roughly comparable to the most recent decline. But in prolonged severity the recession and depression of 1929-33 have no counterpart in the economic records of recent years. Reflections of the drastic preceding recession will appear in the movements of recovery, which may be dated from the early months of 1933.[1]

This recovery was spotty and uneven, probably less homogeneous than any similar period of economic revival of which we have record. Relief from the immediate fears engendered by the banking crisis, a series of developments affecting the present and anticipated values of the dollar, the prospect, and then the reality, of extensive changes in operating and marketing conditions growing out of the adoption of industrial codes, fundamental changes in the conditions affecting the issuance of new securities and the allocation of investment funds, the initiation of Federal expenditures for relief on a hitherto unprecedented scale—these followed one another in rapid succession. Within 24 months the business 'climate' underwent a series of changes such as might normally have been spread over many years. These and other developments affected the shifting course of recovery between February, 1933, and the early months of 1935. The first sharp spurt, which carried to mid-summer, 1933, was followed by a recession, extending to the end of 1933, a spring revival in 1934, a set-back extending through the summer months, and a recovery that has continued through the end of 1934 and the early part of 1935.

Some new factors were present in each of these periods, but the most notable differences separate the first phase of sharp expansion from the alternations of contraction and expansion that follow. These differences lie, partly, in the extent of the movements. The first recovery far exceeded in magnitude the two short up-turns that occurred in the spring of 1934 and the winter of 1934. Again, the first rise and the later movements are marked off by important differences in operating conditions, in the field of manufacturing. The first of the codes introduced under the National Industrial Recovery Act was approved on July 9, 1933; the blanket code accepted by industry under the President's Re-employment Agreement went into effect on August 1, 1933. The operating conditions prevailing in manufacturing industries underwent a major change with the inauguration of the codes. In this fundamental respect, then, the circumstances attending the first phase of recovery, up to the summer of 1933, are clearly distinct from those prevailing thereafter. It is true that the prospect of operation under the codes helped to stimulate the early advance and affected the character of that advance. But the detailed regulations later prescribed under the industrial codes did not, of course, affect operating conditions during this first surge of recovery.

We must recognize that many factors, other than the codes, distinguish the first phase of recovery from the period that followed. The stimulus of monetary change was a potent force in the first surge of renewed activity. Hopes and fears centering around the prospects of inflation were stronger in the first few months than later. Production for stock was perhaps more important during the first phase than during the second, and such production would leave its impress upon the movements of the later period. The potentialities of rapid advance in productivity and sharp reduction of operating costs were greater at the very low level of activity prevailing in February, 1933, than they were after the bloom of the first revival had passed. The factors affecting operating conditions over a short period differ in various ways from those that affect operating conditions over a longer interval. It would be improper to attribute to the influence of the industrial codes all the differences we shall note between the operating conditions prevailing in manufacturing industries prior to and following the adoption of these codes. Yet these differences are part of the data required for an appraisal of the codes and of the shifting currents of economic change from 1933 to 1935.

For these reasons, then, we shall break the two years of recovery here reviewed into two phases—the sharp rise extending from February-March, 1933, to June-July, 1933, and the period from the summer of 1933 to January-February, 1935. Since the turning points that mark off these periods of recovery from one another are not in all cases clearly to be located in one particular month, and since they do not coincide, in time, for all the series to be followed, the limits of the several periods are set with reference to averages of measurements covering two months.

The basic series from which all other measurements are derived, in tracing the changes of recovery, are given in

[1] It is an open question whether this revival in the United States should be dated from February-March, 1933, or from mid-summer, 1932. The physical volume of production reached lower levels in 1932 than in 1933; the number of wage-earners employed was as low in 1932 as in early 1933. On the other hand, aggregate wage disbursements and average prices, at wholesale, fell to lower levels in 1933. The domestic statistical evidence is thus conflicting, on the interesting question as to whether the downswing that accompanied the political uncertainties of late 1932 and early 1933 marked a continuation of recession and depression, or a check to recovery that was already under way. (As regards world conditions generally, a recovery seems to have begun in 1932.) For the present purpose, it is desirable to measure changes from the low point of early 1933.

TABLE 1

A RECORD OF THE FORTUNES OF MANUFACTURING INDUSTRIES OF THE UNITED STATES DURING RECOVERY, 1933-1935[1]

BASIC MEASUREMENTS

	February-March 1933	*June-July 1933*	*January-February 1935*
Physical volume of production	100	157	149
Number of wage-earners employed	100	115	133
Total wage disbursements (payrolls)	100	127	172
Average number of working hours per week, per person	100	114	95
Average selling price of products	100	109	124

[1] Descriptions of the series given in this table will be found in the notes at the end of this paper.

Table 1, in relative form. These series are based upon records of production, employment, payrolls, hours and selling prices relating to the operations of the major manufacturing industries of the United States.

The general changes occurring during the periods distinguished in Table 1 are familiar. The first spurt of recovery carried all series upward, the advance of 57 per cent in production being outstanding. The changes of the nineteen months following brought a net reduction in production, further notable advances in prices, payrolls and number employed, and a pronounced decline in average hours worked per week.

But a more detailed comparison of these movements is required to bring out the distinctive features of the period that opened with the spring revival of 1933. In making such comparisons, and in deriving the requisite measurements, we must recognize the limitations of the data. There are some differences in the degrees of coverage of the series listed above. Payroll and employment statistics are drawn from 90 manufacturing industries. Records of average hours worked per week relate to 78 manufacturing industries, and within these industries the coverage is somewhat less than for payrolls and employment. Price and production records relate to still different samples of manufacturing operations at large—broad samples, but not the same, in detail, as those from which the other figures come. Comparison of these records and the derivation of measurements from such comparisons must proceed on the assumption that each of the basic series is representative of manufacturing industries in general. Since this assumption is made, the various derived measurements given below should be looked upon as indexes of general tendencies, not as highly accurate measurements of detailed movements.[2]

In respect of timing, certain other difficulties face us, in making comparisons. The basic production statistics are monthly averages or aggregates, while the records of employment, payrolls and hours for each month are derived from data relating to the week ending at the date nearest the middle of the month. The original price quotations vary in this respect, some being averages of daily figures, some averages of weekly quotations, some quotations as of specific dates.

[2] That these series do reflect the general changes occurring in the operations of manufacturing industries is indicated by a comparison with measurements that are comparable, in detail, in respect of coverage. The following series all relate to the same group of 15 important manufacturing industries: those producing iron and steel, automobiles, cigars and cigarettes, cement, leather, boots and shoes, rubber tires and inner tubes, lumber, woolen and worsted goods, cotton goods, carpets and rugs, and flour, and the meat packing, sugar refining and petroleum refining industries. In 1933 the total 'value added' by these industries constituted 24 per cent of the aggregate 'value added' by all manufacturing industries of the United States. We have in this group, therefore, a substantial representation of all manufacturing industries. Measurements derived from these industries will serve to check the more general measurements given in the text. Since, at the time of writing, the detailed measurements are available only through January, 1935, the comparative measurements given extend only through December, 1934-January, 1935.

The fundamental series, for all manufacturing industries and for these 15 industries, appear below.

	Feb.-March 1933	*June-July 1933*	*Dec. 1934-Jan. 1935*
Physical volume of production			
All manufacturing industries	100	157	137
15 industries	100	171	150
Number of wage-earners employed			
All manufacturing industries	100	115	131
15 industries	100	123	139
Total wage disbursements (payrolls)			
All manufacturing industries	100	127	165
15 industries	100	149	195
Average number of working hours per week, per person			
All manufacturing industries	100	114	94
15 industries	100	122	97
Average selling price of products			
All manufacturing industries	100	109	123
15 industries	100	114	130

In this sample, rather heavily weighted by certain basic industries, we find fluctuations more violent than those occurring in manufacturing industries at large, but of the same general character. What is equally important, the relations among the series, with a single minor exception, are the same. It is these relations with which we are concerned.

The difficulties, in respect of the comparability, in time, of the production records and the other series, are greatest for the automobile industry. The cotton textile industry, during the recovery of 1933-35, was also marked by distinctive changes. We may test

Each set of figures may be taken, however, to be generally representative of conditions prevailing in given months. Greater difficulties are introduced by the fact that the final emergence of finished manufactured products lags behind the expenditure of labor and of money in the preliminary productive processes. This lag is not a serious barrier to accurate comparison of statistics of final production and statistics relating to the earlier processes of production if the flow of materials be reasonably steady. When the process is an extended one, however, and when considerable variations in the rate of flow occur, the accuracy of comparisons of concurrent statistics is lessened. Records of employment and payrolls relating to a period of reduced activity may be set against a flow of finished products resulting from a preceding period of excessive activity. Conversely, technical conditions of production may force the maintenance of a considerable labor force even though the production of finished products has been sharply reduced. The automobile industry, with its periods of preparation for the output of new models, and the steel industry furnish examples of production and labor statistics not always strictly comparable on a current monthly basis. If the lags in a particular industry were constant, account could be taken of them, but in some instances they vary appreciably from time to time.

The seasonal factor also complicates the task of comparison. Some of the basic series compared are subject to seasonal fluctuations, others are not. However, there are real doubts as to whether the customary seasonal movements have prevailed, in all cases, under the abnormal conditions of severe depression. In some instances it is certain that they have not. Moreover, the magnitude of the usual seasonal movements is much smaller than the changes here recorded. For these reasons it has seemed desirable, in the present comparisons, to attempt no correction for assumed seasonal variations. The actual records of manufacturing operations have been utilized.

Various technical difficulties, of the types mentioned, are faced in the comparative study of month-to-month fluctuations. Those general movements that persist over longer periods will not be obscured, however, by the erratic changes arising from varying temporal relations of production, employment and prices. In the comparisons actually made in the following pages the difficulty introduced by erratic month-to-month movements is met, in part, through the comparison of averages for several months, rather than indexes for single months. Even so, not too much weight should be attached to extreme movements for limited periods, in records relating to single industries. When the records for different industries support one another, however, and when movements persist over time, it is justifiable to conclude that we are dealing with significant changes, and not with erratic fluctuations resulting from shifting leads and lags among the series compared.

With these considerations and limitations in mind, we may draw such information as we can from the basic measurements cited in Table 1. The index numbers presented in Table 2, which have been derived from those in Table 1, define important aspects of the changes occurring in this period of revival.

TABLE 2

A RECORD OF THE FORTUNES OF MANUFACTURING INDUSTRIES OF THE UNITED STATES DURING RECOVERY, 1933-1935

DERIVED MEASUREMENTS[1]

	February-March 1933	*June-July 1933*	*January-February 1935*
Gross income	100	171	185
Total employment (man-hours)	100	131	126
Average output per wage-earner	100	137	112
Average output per man-hour	100	120	118
Average earnings per wage-earner	100	110	129
Average hourly wages	100	97	137
Average labor cost per unit of product	100	81	115

[1] Explanations of the methods employed in deriving these index numbers will be found in the notes at the end of this paper.

The five basic series and the seven sets of derived measurements constitute the materials of the following analysis. Using these, we may follow the course of recovery and note certain of the changes occurring in the operating conditions of manufacturing industries, and in the relations of these industries to other elements of the national economy.[2]

[2] In this survey we shall use the measurements given in Tables 1 and 2, which are taken to be representative of the movements

---

the representative character of the general record by narrowing the sample still further, omitting these two industries. The following measurements relate to 13 manufacturing industries.

	Feb.-March 1933	*June-July 1933*	*Dec. 1934-Jan. 1935*
Physical volume of production	100	164	141
Number of wage-earners employed	100	121	130
Total wage disbursements (payrolls)	100	148	178
Average number of working hours per week, per person	100	124	98
Average selling price of products	100	116	134

Again, in this smaller sample of comparable measurements, we find general agreement with the record of the more comprehensive index numbers. There is not absolute agreement in respect of the magnitude of fluctuation, but the directions of movement and the relations among the various series are similar. The representative character of the more general measurements given in the text is validated by the more closely controlled comparisons based on the smaller samples.

II. CHANGES IN MANUFACTURING PRODUCTION, PRICES, EMPLOYMENT, WAGE DISBURSEMENTS AND COSTS DURING THE RECOVERY OF 1933-1935

In following changes in the operations of manufacturing industries since the early months of 1933 we shall deal with various combinations of the measurements presented in Tables 1 and 2. Each combination will contain a single series of major importance and two component elements of that series. In each case the movements of the three related series should be compared. For convenience of reference, the measurements entering into the various combinations are brought together in Table 3. The subsequent discussion should be followed with reference to the detailed entries in this table.

occurring in manufacturing industries at large in the United States. Attention has been drawn to the lack of perfect comparability among some of the series employed. However, the general conclusions drawn from these comparisons are supported by evidence relating to the smaller sample of 15 major manufacturing industries, for which comparable measurements were given in footnote 2. Index numbers derived from these measurements appear below, together with similar measurements for all manufacturing industries.

	Feb.-March 1933	*June-July 1933*	*Dec. 1934-Jan. 1935*
Gross income			
All manufacturing industries	100	171	169
15 industries	100	195	195
Total employment (man-hours)			
All manufacturing industries	100	131	123
15 industries	100	150	135
Average output per wage-earner			
All manufacturing industries	100	137	105
15 industries	100	139	108
Average output per man-hour			
All manufacturing industries	100	120	111
15 industries	100	114	111
Average earnings per wage-earner			
All manufacturing industries	100	110	126
15 industries	100	121	140
Average hourly wages			
All manufacturing industries	100	97	134
15 industries	100	99	144
Average labor cost per unit of product			
All manufacturing industries	100	81	120
15 industries	100	87	130

In the pages that follow no detailed reference is made to the index numbers relating to these 15 industries. We have here, however, a set of measurements more carefully controlled, in respect of comparability, than are the more comprehensive series cited in the text. The reader seeking to check the statements in the text, concerning general tendencies in manufacturing industries, should refer to the index numbers in this note and in note 2.

Manufacturing Gross Income and Component Elements

Changes in the gross income of manufacturing industries may result from changes in the number of units produced, or in the average selling price per unit. The first three sets of measurements in Table 3 define these movements during the recovery of 1933-35.[4] In tracing these movements an effective comparison may be made between the changes occurring in the sharp revival of the first four to five months and the net changes of the succeeding year and one-half. As regards gross income and production, a clear conflict of tendencies is revealed. The net gains of the entire period were substantial (85 per cent in gross income, 49 per cent in number of units produced and 24 per cent in average price per unit). Prices advanced persistently in both periods, but in the field of production the advance was achieved within the first brief phase of recovery. During the later era of code installation and operation under the codes, output declined. Gross income, supported by favorable price movements, showed a net advance of eight per cent.

Of course, many factors operated during both the pre-code and code periods. Anticipation of the codes played a part in the first advance. A natural reaction from the tremendous activity of the first advance, activity leading to production of goods in excess of current needs, is reflected in the later record. We shall have a better basis for judgment concerning the part played by code enforcement in the changes of these periods when we have pressed our inquiry further, for the changes defined by certain of the other series are more closely connected with code provisions. The factors affecting total employment are in this category.

Total Manufacturing Employment and Component Elements

The total volume of employment is properly measured in terms of man-hours. Changes in the number of persons employed and in the average hours of work will affect this total. Items (4), (5) and (6) of Table 3 summarize the record of recovery in these elements. The notable increase of 31 per cent in total employment in the pre-code period resulted from almost equal advances in the number employed and in the average number of hours worked per wage-earner. Between mid-summer, 1933, and early 1935 the total volume of employment dropped 4 per cent. This took the form of a considerable decline in average hours worked, a decline only partially offset by an increase in the number employed. These changes, of course, are the manifestations of definite elements of the recovery program. There was spreading of work under the codes, it is true, but by early 1935 it was a smaller total volume of employment that was

[4] In all threefold comparisons of this sort the figure relating to one series is the product of the corresponding figures for the two other series, in the sense that $1.71 = 1.57 \times 1.09$.

TABLE 3

CHANGES IN MANUFACTURING OPERATIONS, 1933-1935
A COMPARISON OF MOVEMENTS DURING DIFFERENT PHASES OF RECOVERY

	Percentage change from		
	Feb.-March 1933 to June-July 1933	*June-July 1933 to Jan.-Feb. 1935*	*Feb.-March 1933 to Jan.-Feb. 1935*
GROSS INCOME AND ITS ELEMENTS			
1. Gross income	+71	+ 8	+85
2. Production (physical volume)	+57	− 5	+49
3. Selling price of products (average)	+ 9	+14	+24
EMPLOYMENT AND ITS ELEMENTS			
4. Total employment (man-hours)	+31	− 4	+26
5. Wage-earners employed	+15	+16	+33
6. Working hours per person (average weekly)	+14	−17	− 5
PRODUCTION AND ITS ELEMENTS			
2. Production	+57	− 5	+49
5. Wage-earners employed	+15	+16	+33
7. Output per wage-earner (average)	+37	−18	+12
4. Total employment (man-hours)	+31	− 4	+26
8. Output per man-hour (average)	+20	− 1	+18
WAGE DISBURSEMENTS AND ELEMENTS			
9. Wage disbursements	+27	+35	+72
5. Wage-earners employed	+15	+16	+33
10. Earnings per wage-earner (average)	+10	+16	+29
4. Employment (man-hours)	+31	− 4	+26
11. Hourly wages (average)	− 3	+41	+37
2. Production	+57	− 5	+49
12. Labor cost per unit (average)	−19	+42	+15

shared among a body of workers some 16 per cent larger. The period of recovery as a whole shows fairly substantial increases in total employment and in number of persons employed, and a drop of 5 per cent in the average number of hours worked, per person.

Physical Volume of Manufacturing Production and Component Elements

Changes occurring in the volume of manufacturing production may be viewed as the resultants (though not necessarily in a causal sense) of changes in the number employed and in output per worker. Items (2), (5) and (7) of Table 3 relate to these series.

The sharp advance in volume of production during the pre-code period was achieved through an increase in the number of workers and a still more pronounced increase in output per person employed. (This latter gain was partially attributable, of course, to an increase in hours of work.) These were changes of the sort customarily occurring in revival, though of exceptional magnitude.[5] A gain of 57 per cent in volume of output, from the very low level of early 1933, carried with it, almost inevitably, a notable advance in output per person, per machine in use, and per man-hour. (We would mis-read the figures if we should take this gain to be the result of a great technical revolution. No such revolution occurred during this brief period of four or five months. The potential advantages of earlier improvements, technical and otherwise, could be realized when this sharp gain in volume of output occurred.) During the year and one-half that followed this early pre-code spurt the number employed continued to increase. Both output per person and aggregate production declined, however.

Changes in the average length of the working week affect the preceding measurements of output per person. In Table 3 changes in total output are shown, in relation to changes in man-hours and in output per man-hour [items (4) and (8)]. Indexes of output per man-hour are a measure of true productivity, far more accurate, of course, than is a measure of output per person under conditions marked by changing hours of work.

The advance of 20 per cent in output per man-hour in

[5] It is probable that returns from all manufacturing establishments, if they could be secured, would show a somewhat smaller increase in production than that indicated by the present records. The great staples necessarily bulk large in any representative index number of production, and these staples are subject to somewhat more extreme swings than are the more diversified final products of manufacture. But that the gain of this period was one of extraordinary magnitude is not to be doubted.

ıe first early spurt was in some degree a cause, in greater egree a result, of the notable increase in total output. Inreased market demand made possible an increase in productivity, an increase in its turn facilitated by earlier imrovements in equipment, in technique and in the quality f labor. Over the 19 months that followed this pro-ounced gain in productivity, output per man-hour was ubstantially unchanged. A net decline of one per cent is ndicated by the available records. This, of course, is an .verage figure, behind which there doubtless lie productivty losses in certain industries, gains in others.[6] The figures lefining net change, over the entire period of recovery, how a rise of 49 per cent in volume of production, an ad-'ance of 18 per cent in output per man-hour.

Total Wage Disbursements of Manufacturing Industries, ınd Elements of the Total

We turn to a survey of wage disbursements during the :ecovery, viewing these, first, from the point of view of wage recipients. Changes in the aggregate, and in two elements of the aggregate, during the several phases of recovery are defined by the measurements following items (9), (5) and (10) of Table 3.

Total wage disbursements expanded during both pre-code and code periods, the relative advance in the second period being somewhat greater than the gain in the shorter pre-code period. Increases in the number of wage-earners and in average earnings per wage-earner contributed, during both phases of recovery, to the expansion of the aggregate wage bill.

More light is thrown on the changes in wages and earnings during these periods by a somewhat different division of elements. Total wage disbursements may be considered as the product of the number of hours worked and the average wage per hour. Analysis into these elements, which appear as items (4) and (11) in Table 3, makes it possible to follow changes in wage rates, and to determine the relation of these changes to fluctuations in total wage disbursements.

We find quite diverse changes during the two periods compared. The pre-code advance of 27 per cent in the aggregate earnings of manufacturing labor was accompanied by a sharp rise in total man-hours worked (31 per cent), and by a drop of 3 per cent in the average hourly wage. In the later period, characterized by operation under new wage provisions and by a net decline in volume of production, we find a drop of 4 per cent in total man-hours worked, an advance of 41 per cent in average hourly wages. Here was a new factor at work in a period of revival, with definite wage regulations increasing hourly rates at a much earlier stage than was to be expected from the processes of customary revival. The net effect was to increase total wage disbursements 35 per cent between June-July,1933, and January-February, 1935, in spite of declining employment and declining production. Over the entire period of recovery we have a pronounced advance in total wages paid, a considerable rise in man-hours worked, and a notable increase in hourly rates of pay.

It is desirable to trace some of the economic accompaniments of these widely different means of achieving the same result—the result being a given gain in the aggregate wages disbursed to manufacturing labor. Certain of these consequences may be followed by comparing changes in wage disbursements [item (9) of Table 3], with changes in total volume of production [item (2)], and in labor cost per unit of product [item (12)].

The increase of 27 per cent in the total wage bill of manufacturing industries during the period of pre-code expansion may be viewed as the net resultant of a gain of 57 per cent in number of units produced and a decline of 19 per cent in average labor cost per unit. Thus, although the average hourly wage dropped only 3 per cent, and average earnings per wage-earner increased 10 per cent, the labor cost per unit fell 19 per cent. This was the result, of course, of a gain of 20 per cent in output per man-hour. This reduction of an important element of production costs worked definitely toward the correction of the great disparity between the prices of raw materials and of manufactured goods that existed at the low point of the depression.

The advance of 35 per cent in total wage disbursements during the code period resulted from two quite different types of change in the component elements. The number of units produced fell 5 per cent, while average labor costs, per unit of product, rose 42 per cent. Increasing production and falling labor costs accompanied the first rapid gain in the total rewards of manufacturing labor. Decreasing production and sharply rising labor costs accompanied the later advance in aggregate payments to labor.[7] For the

[6] It is convenient to measure industrial productivity on a man-hour basis. This is not to be taken to mean that changes in productivity are due exclusively, or even primarily, to the human factor in production. Mechanical equipment and business organization may be far more important factors in changing productivity than human skill or intensity of application.

[7] This measurement of advance in labor costs is subject to at least two types of bias. It is probable that the larger establishments, which are represented in the sample from which data on payrolls are secured, conformed more closely, on the whole, to code regulations than did the smaller establishments. This would tend to make the measurement of labor costs somewhat higher than it would be were complete coverage possible. On the other hand, it is known that there is a negative bias in the reported payroll statistics, arising from the use of a constant sample. Such bias would tend to lower the measure of labor costs. It is to be noted that these errors, if present, tend to offset one another.

period of recovery as a whole an increase of 15 per cent in labor costs per unit and an increase of 49 per cent in number of units produced contributed to an advance of 72 per cent in total wages paid.

In interpreting these figures and in comparing the pre-code and code periods we must allow, again, for the influence of factors not connected with code administration. A sharp drop in labor costs per unit of product was to be expected, during the first spurt of revival, as an accompaniment of the pick-up from the very low level of activity prevailing in February, 1933. The situation in mid-summer, 1933, offered no such potentialities of sudden reduction in operating costs, even though all working conditions had remained unchanged. On the other hand, had working conditions remained unchanged, it appears altogether unlikely that the first reduction of 19 per cent in labor costs would have been followed by an advance of 42 per cent.[8]

Summary of the Changes of Recovery in Manufacturing Industries

The period between February-March, 1933, and the beginning of 1935 was marked by a curious combination of movements, in the operations of manufacturing industries. We shall understand these movements better if we place in contrast the series in which reversals of movement occurred, after the pre-code spurt of the early months, and the series in which movement of the same general character persisted, during the entire period. We note the following:

Series increasing during pre-code period, with net decline thereafter:

a. Physical volume of manufacturing production
b. Total employment (man-hours)
c. Average weekly working hours per person
d. Output per wage-earner
e. Output per man-hour. (There was a slight net decline in this index, in the code period, but, substantially, it stood at the same level in early 1935 as in mid-summer, 1933.)

Series declining during pre-code period, with net advance thereafter:

a. Average hourly wages
b. Labor cost per unit of product

(At the time of writing, these individual records are available only through January, 1935.)

INDUSTRY	INDEX NUMBERS FOR DEC. 1934-JAN. 1935 (AVERAGE OF FIGURES FOR FEB.-MAR. 1933=100)		
	TOTAL WAGE DISBURSEMENTS	PHYSICAL VOLUME OF PRODUCTION	LABOR COST PER UNIT OF PRODUCT
All manufacturing industries	165	137	120
Fifteen manufacturing industries	195	150	130
Flour milling	131	98	134
Meat packing	160	127	126
Sugar refining, cane	114	103	111
Carpets and rugs	211	153	138
Cotton goods	189	101	187
Woolen and worsted goods	177	174	102
Lumber (sawmills)	200	128	156
Petroleum, refining	122	114	107
Rubber tires and tubes	225	179	126
Boots and shoes	125	96	130
Leather	160	122	131
Cement	139	113	123
Iron and steel	231	228	101
Automobiles	268	212	126
Cigars and cigarettes	131	123	107

These detailed figures confirm the measurements relating to aggregates. The advance in labor costs during the two years of recovery from 1933 to early 1935 was general, among the individual industries for which we have records.

The figures given above for the automobile industry call for comment. It is characteristic of this industry that pronounced shifts occur in the relations between wage payments and final production, because of seasonal marketings and annual changes in models. To allow for these shifts, we may compare production and wage shifts in the automobile industry by six-month periods.

PERIOD	TOTAL WAGE DISBURSEMENTS (PAYROLLS)	PHYSICAL VOLUME OF PRODUCTION	AVERAGE LABOR COST PER UNIT OF PRODUCT
January-June, 1933	100	100	100
July-December, 1933	129	93	139
January-June, 1934	237	172	138
July-December, 1934	170	108	157

The most unambiguous comparison is probably that between the first six months of 1933 and the first six months of 1934, for seasonal movements are thus avoided. An advance of 72 per cent in production was accompanied by an advance of 38 per cent in labor costs per unit of product, in the automobile industry.

This example illustrates the difficulty of comparing monthly data relating to wage payments and total production. General movements may be followed, but the figures should not be looked upon as completely accurate for any one month.

[8] The apparent advance of 42 per cent in average labor cost per unit of product in American manufacturing industries between June-July, 1933, and January-February, 1935, reflects, in part, the abnormal conditions prevailing in mid-summer, 1933, after the first spurt of revival. This figure is useful for comparative purposes, but is not to be taken as an accurate measure of changing industrial efficiency. More significance attaches to the measure defining the change in average labor cost per unit over the two years from February-March, 1933, to January-February, 1935. This net advance of 15 per cent, over a period which includes the sharp reduction of labor costs that occurred during the first four months, was substantial, representing a notable deviation from the typical movement of recovery.

The importance of this matter warrants the presentation of detailed figures on changes in production, in aggregate wage payments and in estimated labor cost per unit of product for the 15 individual industries for which comparable data are available.

Series increasing in both periods:

a. Gross income of manufacturing industries
b. Average selling price of manufactured products
c. Number of wage-earners employed in manufacturing industries
d. Total wage disbursements by manufacturing industries
e. Average earnings per employed wage-earner

If we look at the first two lists, there is every evidence of a reversal of business tendencies after the general upward movement of early 1933. Not only did physical output show a net decline, but the evidence of internal difficulties in the form of retarded productivity and advancing labor costs adds to the darkness of the picture. And yet, thereafter, prices continued to rise, gross income advanced, wage disbursements continued to increase, earnings per employed worker rose, and the number of workers on payrolls continued to increase. Purchasing power was being disbursed in ever-expanding volume, despite the apparently adverse conditions indicated by the various records of physical production, productivity, and labor costs. Here was a curious set of conflicting movements. But we shall have a better perspective on these shifts when we compare them with changes during the preceding recession, and during earlier periods of business revival.

Recovery Movements in Relation to a Pre-Recession Standard

Any economic recovery is, obviously, closely related to the preceding period of recession. That recession must condition the recovery at many points, and vitally affect its character. The exceptional gravity and extent of the recession in American business between 1929 and early 1933 cannot be ignored in surveying the changes brought by recovery. For this reason, we supplement the survey of changes occurring during the phase of recovery, alone, by a summary account of these changes viewed against a pre-recession base. Measurements are given in Table 4. (Certain of the series given in Table 3 do not appear in Table 4.

TABLE 4

RECESSION AND RECOVERY IN AMERICAN MANUFACTURING INDUSTRIES, 1929-1935

	June-July 1929	*February-March 1933*	*June-July 1933*	*January-February 1935*
	IN CURRENT DOLLARS			
GROSS INCOME AND ITS ELEMENTS				
1. Gross income	100	34	58	62
2. Production (physical volume)	100	49	77	72
3. Selling price of products (average)	100	69	75	86
PRODUCTION AND ITS ELEMENTS				
2. Production	100	49	77	72
5. Wage-earners employed	100	57	65	76
7. Output per wage-earner	100	86	118	95
WAGE DISBURSEMENTS AND ELEMENTS				
9. Wage disbursements	100	35	45	61
5. Wage-earners employed	100	57	65	76
10. Earnings per wage-earner (average)	100	61	69	80
11. Average hourly wage	100	78	76	102
2. Production	100	49	77	72
12. Labor cost per unit of product (average)	100	71	58	85
	IN DOLLARS OF CONSTANT PURCHASING POWER			
GROSS INCOME AND ITS ELEMENTS				
1. Gross income[1]	100	54	82	75
2. Production (physical volume)	100	49	77	72
3. Selling price of products (average)[1]	100	111	106	104
WAGE DISBURSEMENTS AND ELEMENTS				
9a. Wage disbursements[2]	100	49	61	74
5. Wage-earners employed	100	57	65	76
10. Real earnings per wage-earner (average)[2]	100	86	94	97
11. Average hourly wage[2]	100	108	103	124
9b. Wage disbursements[1]	100	56	63	73
2. Production	100	49	77	72
12. Labor cost per unit of product[1]	100	114	82	102

[1] The index number of wholesale prices constructed by the National Bureau of Economic Research was used as a deflator.
[2] The index of the cost of living of industrial workers constructed by the National Industrial Conference Board was used as a deflator.

Where doubts as to the accuracy of the measurements for the longer period were serious, it appeared desirable to restrict statements to general terms, and not to cite specific figures.)

Shifting the standard of reference to a pre-recession base has one immediate effect—that of reducing the apparent magnitude of the shifts of recovery. For the recession carried most economic series to such low levels in the winter of 1932-33 that the succeeding rises, in percentage terms, run into relatively high figures. On a pre-recession base the percentage changes are much less pronounced.

In summary, the situation as of January-February, 1935, with reference to the situation existing in June-July, 1929, was marked by the following features:

The gross income of manufacturing industries had been reduced 38 per cent, in current dollars, 25 per cent, in dollars of constant purchasing power, at wholesale. The physical volume of manufacturing production was 28 per cent below the 1929 standard. Per-unit prices were lower, but the average per-unit purchasing power of manufactured goods in wholesale markets was higher. Relatively to other goods, commodities of this type cost more, per unit, than in 1929.

The actual volume of manufacturing employment, measured in man-hours, had been reduced more than 40 per cent and the working force had been reduced one-fourth.

Industrial productivity, per wage-earner employed, had declined. Productivity per man-hour had risen. The amount of the rise may be estimated at something more than 20 per cent. This gain had been scored during the period of recession and in the first spurt of revival.

The aggregate purchasing power of manufacturing labor was some 26 per cent lower. The purchasing power of the earnings of each employed worker (whose hours of work were reduced about 30 per cent) had been reduced about 3 per cent. The purchasing power of an hour's wage (i.e. the real hourly wage) had increased approximately 24 per cent.

The total wage bill of manufacturing industries, measured in dollars of constant purchasing power, at wholesale, was approximately 27 per cent lower. Average labor cost per unit of goods produced had risen approximately 2 per cent (cost being here measured in terms of the same constant value standard).

It is apparent from these figures that the recovery in American manufacturing industries has fallen far short of restoring the pre-recession level of gross income, of production, of employment, or of aggregate purchasing power of labor. Industrial productivity on a man-hour basis, is higher than before the recession, nominal and real wage rates are higher, and real labor costs are somewhat higher.

But we need other criteria, in appraising the shifting movements of the current recovery. Earlier periods of business expansion furnish a useful standard of reference.

III. ECONOMIC CHANGES IN MANUFACTURING INDUSTRIES DURING FIVE PERIODS OF BUSINESS EXPANSION, APPROXIMATELY EQUAL IN RESPECT OF DEGREE OF RECOVERY

A comparison of manufacturing operations during different periods of business expansion may be expected to disclose some of the distinctive features of the current movement. It is true that there exists no fixed schedule of recovery, to which business movements always conform, but something of the nature of a common pattern is found in the cyclical fluctuations of the economic system. Some of the characteristics of this pattern, and distinctive deviations from it, are revealed by the series of measurements presented in this section.

Various modes of comparison are possible, in any such survey. For the present purpose it seems desirable to trace the movements of important economic series over periods of expansion marked by approximately equal degrees of increase in the physical output of manufacturing industries. This magnitude, as averaged for the months of December, 1934, and January, 1935, was 37 per cent greater than at the low point of February-March, 1933.[9] It is pertinent to inquire how the changes occurring in manufacturing industries during this period, in respect of employment, productivity, labor costs, etc., compared with corresponding changes during earlier periods of equal increase in volume of output.[10] We should note that in concentrating attention upon the operations of manufacturing industries we ignore numerous economic factors—such as monetary and credit conditions, relations among elements of the price structure, saving and investment—which condition the course and character of recovery. Our interest, however,

[9] Advances of approximately equal magnitude could not be secured for the three preceding revivals, if the record were carried through January-February, 1935. Since we are interested in operating changes accompanying similar advances, we restrict the survey of recent changes to the movements up to January, 1935.

[10] If we compare, with respect to changes in aggregate production, periods of business recovery widely separated in time, error may be introduced into our conclusions by the changing character of the elements entering into the aggregate. Different industries, marked by important differences of cyclical behavior, may dominate a national economy at different times. These dominant industries would place their own impress on the aggregate into which they enter. But over a period of fifteen years no great changes occurred in the relative importance of elements entering into aggregate manufacturing production, in the United States. It is true that the incidence of recovery may be different, at different times, but this is a condition affecting all comparisons of this sort, in which aggregates of any kind are used.

TABLE 5

CHANGES IN MANUFACTURING OPERATIONS DURING FIVE PERIODS OF BUSINESS EXPANSION APPROXIMATELY EQUAL IN DEGREE OF RECOVERY

	Percentage change from				
	Dec. 1921-Jan. 1922 to Sept.-Oct. 1922	*June-July 1924 to Feb.-March 1925*	*Nov.-Dec. 1927 to April-May 1929*	*Feb.-March 1933 to May-June 1933*	*Feb.-March 1933 to Dec. 1934-Jan. 1935*
GROSS INCOME AND ITS ELEMENTS					
1. Gross income	+42	+46	+31	+50	+69
2. Production (physical volume)	+33	+36	+31	+43	+37
3. Selling price of products (average)	+ 7	+ 7	0	+ 5	+23
EMPLOYMENT AND ITS ELEMENTS					
4. Total employment (man-hours)	+19	+14	+13	+21	+23
5. Wage-earners employed	+16	+ 7	+ 9	+ 8	+31
6. Working hours per person (average weekly)	+ 3	+ 7	+ 4	+12	− 6
PRODUCTION AND ITS ELEMENTS					
2. Production	+33	+36	+31	+43	+37
5. Wage-earners employed	+16	+ 7	+ 9	+ 8	+31
7. Output per wage-earner (average)	+15	+27	+20	+32	+ 5
4. Total employment (man-hours)	+19	+14	+13	+21	+23
8. Output per man-hour (average)	+12	+19	+16	+18	+11
WAGE DISBURSEMENTS AND ELEMENTS					
9. Wage disbursements	+24	+14	+14	+16	+65
5. Wage-earners employed	+16	+ 7	+ 9	+ 8	+31
10. Earnings per wage-earner (average)	+ 7	+ 7	+ 5	+ 7	+26
4. Employment (man-hours)	+19	+14	+13	+21	+23
11. Hourly wages (average)	+ 4	0	+ 1	− 4	+34
2. Production	+33	+36	+31	+43	+37
12. Labor cost per unit (average)	− 7	−16	−13	−19	+20

is not in the economy at large, nor in the full complex of circumstances that shape a business revival. It is in a particular segment of the total, and in the internal relations among the elements of this segment. These relations will not be unaffected by external developments, but these developments are of secondary importance in the present comparison.

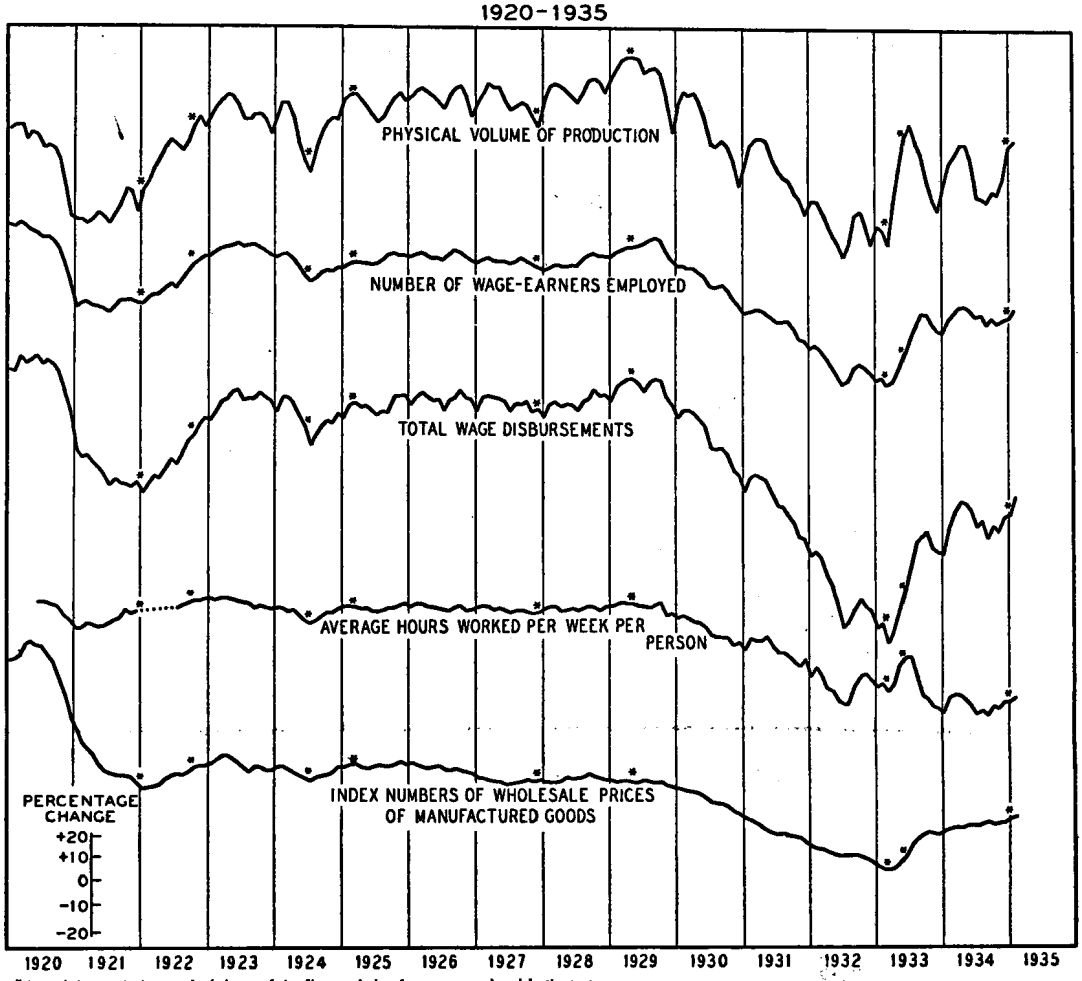
In this comparison, as in the earlier one, no attempt is made to introduce corrections for seasonal movements. Accurate indexes of seasonal variation are not available for all the series. Moreover, it is known that in important industries the customary seasonal pattern has been modified, in recent years. For this reason, and because the cyclical changes here in question are of much greater magnitude than the seasonal changes, it seems advisable to utilize the uncorrected records. Accurate adjustment for seasonal swings would modify the picture in detail, but not in fundamental respects.

We may increase the value of this survey by utilizing two different sets of figures for the most recent recovery. The early spurt of 1933 brought an increase in volume of output well in excess of 37 per cent. The closest possible approach to that figure is provided by the period from February-March, 1933, to May-June, 1933, during which the volume of manufacturing production increased 43 per cent. The changes of this phase may be compared with those of the period February-March, 1933, to December, 1934-January, 1935, as well as with those of the recoveries that began in 1921, in 1924, and in 1927. The period of the first rise, in 1933, is short, and therefore the changes must not be looked upon as resulting from a major technical revolution. They are significant changes, however, as regards the actual operating conditions of industry, and the relation of currently-expended effort to current outlay and current returns.

As in the preceding section we shall deal with certain major series and constituent elements of each series. The measurements appear in Table 5. The basic series are presented graphically, and the dates to which the entries in Table 5 relate are indicated in Figure 1, in order that the nature of the measurements to be compared may be clear. Data are picked from their setting, for the purpose of the quantitative comparison, and it is proper that the reader see what this setting is, in each case.

It is obvious, of course, that although the periods of business expansion here compared cover equal degrees of

FIGURE 1
SELECTED SERIES RELATING TO AMERICAN MANUFACTURING INDUSTRIES
1920-1935



*Asterisks mark the terminal dates of the five periods of recovery analyzed in the text.
Plotted on ratio scale. Uncorrected for seasonal fluctuations.

recovery, when physical output of manufactured goods is the yardstick of recovery, they do not cover equal proportionate parts of business cycles. Phases of revival and expansion vary in amplitude and duration, as do business cycles themselves. In studying certain of the technical aspects of business cycles it is desirable to isolate identical cyclical segments. But interest attaches, also, to the comparison of cyclical movements accompanying given degrees of increase in volume of production. This comparison is here made.[11]

Comparison of the items in Table 5, for different periods of recovery, may be readily made in detail by the reader. Certain general conclusions based upon the above evidence, and other data, are given in the final section of this paper. At this point we may be content with a brief summary of the main points revealed by Table 5.

In respect of the attributes defined by the above measurements, the sharp initial recovery of 1933 appears to have conformed to the pattern of earlier revivals, a pattern which is strikingly repeated in the first four of

[11] Reference has already been made to the exceptional severity of the recession of 1929-33, and to the fact that the relative changes of recovery are affected by the severity of the earlier decline. It is to be expected that recoveries, following recessions of varying magnitudes, will differ, in some respects. We do not now know, however, how the pattern of recovery is affected by the preceding recession. The reader will bear in mind the differing magnitudes of the recessions preceding the phases of expansion to which the measurements in Table 5 relate. It will be useful to recall that the volume of manufacturing production declined approximately 27 per cent prior to the 1921 recovery, 26 per cent prior to the 1924 recovery, and 13 per cent prior to the 1927 recovery, as compared with a drop of about 50 per cent from 1929 to 1933. The price drop of 1920-21 exceeded that of 1929-33.

TABLE 6

CHANGES IN MANUFACTURING OPERATIONS DURING FIVE PERIODS OF BUSINESS EXPANSION APPROXIMATELY EQUAL IN DEGREE OF RECOVERY

Measurements Corrected for Changes in the Value of Money

	Percentage change from				
	Dec. 1921-Jan. 1922 to Sept.-Oct. 1922	*June-July 1924 to Feb.-March 1925*	*Nov.-Dec. 1927 to April-May 1929*	*Feb.-March 1933 to May-June 1933*	*Feb.-March 1933 to Dec. 1934-Jan. 1935*
GROSS INCOME AND ITS ELEMENTS					
1. Gross income[1]	+32	+33	+32	+39	+29
2. Production (physical volume)	+33	+36	+31	+43	+37
3. Selling price of product (average)[2]	− 1	− 2	+ 1	− 3	− 6
WAGE DISBURSEMENTS AND ELEMENTS					
9a. Wage disbursements[2]	+27	+12	+18	+15	+46
5. Wage-earners employed	+16	+ 7	+ 9	+ 8	+31
10. Earnings per wage-earner (average)[2]	+ 9	+ 5	+ 8	+ 6	+11
4. Total employment (man-hours)	+19	+14	+13	+21	+23
11. Hourly wages (average)[2]	+ 7	− 2	+ 4	− 5	+19
9b. Wage disbursements[1]	+15	+ 5	+15	+ 7	+26
2. Production	+33	+36	+31	+43	+37
12. Labor cost per unit (average)[1]	−14	−23	−12	−25	− 8

[1] The all commodities index number of wholesale prices constructed by the United States Bureau of Labor Statistics was used as a deflator for the three earlier periods. For the last two periods the index number of wholesale prices compiled by the National Bureau of Economic Research was used.

[2] The index of the cost of living of industrial workers constructed by the National Industrial Conference Board was used throughout as a deflator.

the five periods covered. But the measurements of net change from early 1933 to early 1935 depart appreciably from the customary pattern of recovery, after depression. The notes that follow relate to the net movements of the period from February-March, 1933, to December, 1934-January, 1935.

This period brought a greater increase in gross income than did equal degrees of recovery, in physical terms, in earlier revivals. A much more rapid rise in per-unit selling prices accounted, of course, for the greater increase in gross income.

The number employed increased much more rapidly. Average hours worked per person decreased; earlier recoveries were marked by increases in average hours worked.

Output per worker advanced only slightly. Substantial increases had marked earlier recoveries. The recent increase in volume of production was effected primarily through the employment of more workers.

The net gain in output per man-hour compares favorably with earlier advances. (The gain in the recent period was effected, it has been noted, during the first five months of recovery.)

Total wage disbursements, earnings per wage-earner, and number employed increased much more rapidly than in earlier revivals.

Earnings per hour increased much more rapidly than in earlier periods of revival.

The total wage bill of manufacturing industries and average labor cost per unit of goods produced increased much more rapidly than in earlier revivals.

It is desirable that we supplement these comparative measurements with others in which some account is taken of changes in the standard of value. A rise of 20 per cent in the average selling prices of manufactured goods will have one meaning when the general level of prices remains constant. It will have a quite different meaning when the general price level falls 20 per cent. So, also, a given gain in aggregate payrolls will mean one thing when living costs remain constant, and quite a different thing when living costs are rising rapidly. No single instrument, suitable for correcting all our value series for changes in the value of money, is available. However, by using a general index of wholesale prices in deflating certain series, and an index of living costs for industrial wage-earners for other series, we may approximate the measurements we desire. The results are given in Table 6.

It is apparent, from a comparison of Table 6 with Table 5, that certain of the distinctive features of the recovery of 1933-35 have been due entirely to the more rapid rise of general prices. The apparent advantage of the more recent recovery in respect of per-unit gain in the selling prices of manufactured goods is removed, when account is taken of changing monetary values.[13] So, also, the gain in the gross

[13] The 6 per cent loss in per-unit worth of manufactured goods between February-March, 1933, and December, 1934-January,

income of manufacturing industries, which was higher for the recent period than for any of the earlier periods, when current dollars were the standard of value, becomes the lowest of the figures compared, when correction is made for changing monetary values.

Recent advances in wage disbursements and in the rewards of labor remain substantially above similar gains during earlier periods of recovery, after full account is taken of changing living costs. The total purchasing power of manufacturing labor increased 46 per cent between the low point of early 1933 and the beginning of 1935. The nearest approach to this figure, during periods marked by equal degree of recovery, came in the 1921-22 recovery, when payrolls, corrected for changes in the cost of living, advanced 27 per cent. Comparison of the entries for the last two periods shows that the major part of the recent gain of 46 per cent came after mid-summer, 1933. Reference to the measurements relating to average real hourly wages shows that the active factor in this gain was provided by a sharp increase in real hourly rates of pay (i.e. money rates corrected for living costs). The rise of 19 per cent in these rates, from 1933 to 1935, stands in notable contrast to the narrower movements of earlier revivals.

If we may measure changes in the purchasing power of the manufacturer's dollar with reference to changes in the general level of wholesale prices, and deflate total payrolls accordingly, we have the corrected wage disbursement figures given after item (9b) of Table 6. In dollars of constant purchasing power at wholesale the wage bill of manufacturing industries shows an advance of 26 per cent over the period of recovery in 1933-35. This is distinctly higher than the advances during earlier revivals marked by roughly equal increases in the volume of manufacturing production. The explanation is found in the measurements of changing labor costs, per unit of product. In terms of the same constant dollars, these costs dropped 8 per cent from 1933 to 1935, as compared with drops of from 12 to 25 per cent in earlier recoveries.

Perhaps the most significant comparisons to be made, among the measurements in Tables 5 and 6, are those relating to the changes from February-March, 1933, to May-June, 1933, and from February-March, 1933, to December, 1934-January, 1935. The actual degrees of recovery were nearly the same; the bases from which changes are measured are identical. It is reasonable to assume that the differences between the two sets of measurements are due to new factors introduced into the operations of manufacturing industries after June, 1933. The most important of these new factors were those connected with the industrial codes.

1935, is to be interpreted with reference to the base from which the change is measured. At the low point of early 1933 manufactured goods enjoyed a much greater relative advantage than in any of the three preceding depressions. Reduction of this advantage was the more imperative, therefore, with reference to the conditions of general recovery.

IV. SUMMARY

We may accept the figures presented above as generally representative of the currents of change that have been running in recent months and in earlier periods of business revival, althought we recognize that in detail they would be subject to correction were data relating to all manufacturing industries available. Certain general conclusions are suggested by the findings of fact.

The advance of the pre-code period, from February-March, 1933, to June-July, 1933, definitely followed the pattern of the earlier periods of revival. Primary emphasis was on production as a means of expanding income, profits and the returns of labor. Production advanced more rapidly than selling prices. Production advanced more rapidly than the number of persons employed, and productivity per worker increased. Production advanced more rapidly than number of man-hours worked, and output per man-hour increased. Production advanced more rapidly than wage disbursements, and labor cost per unit of product declined. Expanding production was a major factor in advancing gross income.

With respect to the purchasing power of labor, expanding production played a dominant part. Labor costs per unit of output declined, with rising volume augmenting the total wage bill. Time rates for labor held practically constant, during revival; increasing man-hours of employment operated as the active factor in the expansion of aggregate returns. Total employment (man-hours) rose more rapidly than did the number of persons employed; hours of employment per person increased.

Rapidly increasing production and more slowly rising prices contributed to a sharp advance in gross income. This meant, although present records do not bear on this point, immediate increases in profits, in the aggregate.

These were the conditions accompanying a revival of the traditional type. There is, of course, no reason to accept the pattern of earlier revivals as a criterion to which recovery from the depression of 1931-33 must necessarily conform. This was a graver depression than those we had known before; it differed in character as well as in degree from similar periods of economic stagnation in the past. Moreover, the periods of activity that were launched by these earlier revivals were marked by important economic as well as social defects. There is nothing sacred about the standard defined by these precedents. Yet, in default of other standards, we must get from them such information as we may concerning the operating conditions of this little-understood industrial machine of ours.

The recovery of 1933-35 is differentiated from earlier revivals by the reversal of the traditional pattern of revival that may be dated, it appears, from the general adoption of industrial codes that began in mid-summer, 1933. Of course, it is not fair to conclude that the codes alone accounted for all the reversals we have noted. Many circumstances affected the economic changes of these disturbed months. But it is a just assumption that the new industrial environment created by the codes had an immediate effect upon the internal operating conditions defined by the various ratios presented in earlier sections.

The outstanding feature of the code period lies in the apparent reduction of emphasis on production and industrial productivity as a means of swelling gross income and increasing the aggregate return of labor. Rising prices and somewhat reduced output marked the code period. As regards the productivity of manufacturing industries, the preceding advance (as measured in output per man-hour) appears to have been checked, although no significant decline occurred during the period of operation under the codes. Too much weight should not be placed upon this development, for the factors involved are complex, and the reasons for changes in productivity are seldom clear. The sharp preceding increase in productivity per man-hour (20 per cent in four months) probably represented a full realization of the potential advantages existing at the low point of the depression. A subsequent check does not provide definite evidence of technical or organizational weakness, or of human inefficiency. It is fair to conclude, however, that the new conditions existing after mid-summer, 1933 did not provide a stimulus to enhanced industrial efficiency.

An increase in the aggregate purchasing power of labor was one of the objectives of the recovery program, and such an increase has been very definitely won. Over a period of some 22 months, while the physical volume of manufacturing production was increasing 37 per cent, aggregate wage disbursements by manufacturing industries increased 65 per cent.[13] Equal production increases during the three preceding revivals had brought advances of from 14 to 24 per cent in total wage disbursements. What is here notable is not the degree of increase, however. The fact that wage payments had dropped to excessively low levels in the winter of 1932-33 would lead one to expect a sharper relative advance, with recovery. The distinctive features of the recent rise are found in its relations to other movements of the recovery period. It was an advance accompanied by higher costs, per unit of time and per unit of output, for the services of manufacturing labor, and herein it departed most significantly from the traditional pattern of revival.

Adjustment of these various measurements to take account of changes in the level of prices and in living costs alters the general picture somewhat. The rise in selling prices of manufactured goods in the recent recovery is reduced by such adjustment. The increase in the aggregate purchasing power of manufacturing labor is less pronounced than the increase in wages in terms of current dollars (the actual increase in purchasing power amounted to 46 per cent, however). So, also, the measurement of the changes occurring during the recovery of 1933-35 against a pre-recession standard changes the perspective, and reduces the apparent magnitude of some of the recent changes.

But the characteristic features of the recovery of 1933-35 are clearly discernible, no matter what the standard of reference may be. An apparent check to the advance in industrial productivity, after mid-summer, 1933, a reduction of working hours and an exceptionally heavy use of men to maintain a given volume of physical output, a relatively sharp advance in the aggregate purchasing power of labor and notable advances in labor costs per unit of time and per unit of product are distinctive of the recent recovery.

High labor costs were, of course, a necessary accompaniment of a rapid increase in the time rate of wage payment, unaccompanied by an equal gain in productivity, and of a rise in total wage disbursements far exceeding the increase in physical volume of production. The price of an expansion in purchasing power, so achieved, was the exceptional rise in costs we have noted.

Why did this notable rise in hourly wage rates, in aggregate wage payments, and in labor costs per unit of product not lead to a much sharper rise in the selling prices of manufactured goods than that actually recorded? The prices of manufactured goods rose less rapidly than the general price level during the recovery of 1933-35, a fact apparently inconsistent with the declining productivity and advancing costs we have noted.[14] The answer, I think, is that

[13] These figures relate to changes between February-March, 1933, and December, 1934-January, 1935. The percentages of increase in production and wage disbursements become 49 and 72, repectively, if the records are carried to January-February, 1935. Since the present figures are given for comparison with movements in earlier revivals, the shorter period is covered.

[14] If we take account of the relative movements of the prices of raw and processed goods over the entire period extending from February, 1933, to the end of 1934, definite reductions of the disparities developing during the recession are to be observed (see *Bulletin 53,* National Bureau of Economic Research, December 22, 1934). Yet we mis-read the changes of this period if we fail to note the actual course and timing of these readjustments.

Correction of the disparities existing in February, 1933, called for a rise in raw material prices, relatively to the prices of manufactured goods. Between February-March, 1933, and June-July, 1933, raw materials rose 22.3 per cent in price, manufactured goods 9.0 per cent. This was the pre-code period. During the ten succeeding months from June-July, 1933, to April-May, 1934, the prices of raw materials rose 8.5 per cent, the prices of manufactured goods 10.0 per cent. The earlier ameliorative move-

these advancing costs impeded a downward adjustment of the real prices of manufactured goods, an adjustment imperatively necessary if the foundations of a lasting recovery were to be laid.* During the 43 months of recession from July, 1929, to February, 1933, the prices of raw materials fell 49 per cent; the prices of manufactured goods fell 31 per cent. The gain in the real value, that is in the average per-unit purchasing power, of manufactured goods during this period was 11 per cent. In default of a permanent shift in inter-group relations, correction of this excessive over-valuation of manufactured goods was essential to the restoration of trade in anything approaching normal volume. Some degree of correction was effected, during the period of recovery we have reviewed, but a disparity still existed in the early months of 1935. It was this differential advantage existing at the low point of recession,[18] an advantage that became substantial with an expanding volume of production, that permitted the payment of higher labor costs, and even made it possible for profits to expand, without an exceptional rise in the selling prices of manufactured goods. But the persistence of the margin that permitted higher labor costs to be paid and profits to be reaped, even though volume of output remained low by normal standards, retarded full expansion of sales and of output and the restoration of employment in customary volume. And in so doing it worked to prevent the restoration of a normal volume of wage disbursements.

In following the notable increases in wage disbursements and in labor costs during the recovery of 1933-35 we should not overlook the severity of the preceding declines. If labor costs be measured in the dollars the manufacturer receives for his products (i.e. if labor costs be deflated by an index of the selling prices, at wholesale, of manufactured goods) we find that at the beginning of 1935 these costs stood about where they did in June, 1929. If labor costs in manufacturing industries were high in 1935, then, they were high to the extent that the prices of manufactured goods as a class were high. In respect of the relation of labor cost to the selling prices of manufactured goods, the sharp advance of the period of recovery had done no more than correct for the severe recession that preceded. For labor costs per unit of product had fallen 29 per cent, from June-July, 1929, to February-March, 1933, while the selling prices of manufactured goods had fallen 31 per cent. This means that, with only a minor difference, the aggregate wage bill showed a net decline equal to that occurring in the gross income of manufacturing industries. Wage liquidation paralleled the general drop in gross income, during these four years of recession. In this respect, the recession of 1929-33 stands alone, among recent cyclical declines. For, traditionally, the decline in wage disbursements lags behind the drop in the gross income of manufacturing industries, and labor finds itself, at the bottom of the depression, getting a larger share of the aggregate receipts. This was not true of the 1933 situation.[19]

Of course, the difference between time rates of pay and labor costs per unit of product is to be distinguished, in this analysis. If time rates of pay remain constant, when industrial productivity is increasing, this means that labor as a producer is getting none of the rewards of higher productivity. (As a consumer, of course, manufacturing labor would gain, if the higher productivity were reflected in lower selling prices.) If labor costs per unit of goods produced remain constant, when industrial productivity is in-

ments were definitely reversed, during this period of operation under the codes. A new correctional movement took place during the summer of 1934, a movement clearly attributable to the influence of the drought on the prices of farm products. From April-May to August-September, 1934, the prices of raw materials rose 9.6 per cent, the prices of manufactured goods 2.1 per cent. Thereafter, to the end of 1934, there was no net change in the prices of these groups of commodities.

There was, thus, definite improvement in the relative position of raw materials during the period prior to code enforcement, and during the summer drought in 1934. When the movements of these two periods are removed, we find price changes working against the downward readjustment of the real per-unit value of manufactured goods.

*DIRECTOR'S COMMENT:

Other and equally important causes of the failure of these real prices to fall were: the power to sustain prices and restrict output exerted by industry through N.R.A. codes and non-legal monopolistic devices; the relatively large proportion of overhead in manufacturing costs in heavily mechanized industries; the accounting habits which tend to recover all existing overhead even on small volume, thus increasing unit overhead costs; the resistance that large industries are able to offer to capital reorganization or bankruptcy. It cannot be assumed that lower prices would not have been compatible with the existing wage rates if less efficient competitors had been eliminated, if prices had been forced down either by competition or regulation, and larger volume of production had resulted.

—GEORGE SOULE

[18] The potential advantage resulting from price relations was rendered much greater by a considerable increase in output per man-hour during the 43 months of recession.

[19] The comprehensive biennial records available in Census compilations throw light on these changes, during the 1929-33 recession. In 1929 total wage disbursements constituted 16.5 per cent of the gross income of manufacturing industries. By 1931 this percentage had increased to 17.4. This change is in accord with past experience. By 1933, however, the percentage had dropped again to 16.8. Liquidation of wages lagged behind the general process of liquidation during the first two years of recession, but thereafter the reduction of wages was speeded up. By 1933 wage payments constituted only a slightly larger fractional part of the gross income of manufacturing industries than in 1929.

creasing, this means that manufacturing labor, as a producer, is getting rewards of higher productivity in the form of higher pay. If the real selling prices of manufactured goods fail to fall, at such a time, it means that the benefits of the increased productivity are not being passed on to consumers generally. (Agents of production other than labor are almost certain, of course, to gain, also.)

If we compare early 1935 with June-July, 1929, we find a notable increase in productivity (probably exceeding 20 per cent per man-hour), practically constant real labor costs per unit of product, substantially higher real rates of pay, per hour of work done, and an actual advance in the real prices at which manufactured goods exchange for other goods. In place of the reduction of real production costs and real selling prices that was to be expected in manufacturing industries, in view of the substantial increase in industrial productivity that had occurred between June, 1929, and February, 1935, those costs and prices had advanced. At a time when the strongest considerations relating to general recovery called for lower selling prices, these prices were maintained at levels above those prevailing for commodities in general.

There is some analogy between the situation prevailing in manufacturing industries from 1933 to 1935 and that which prevailed from 1922 to 1929 (see *Economic Tendencies in the United States,* National Bureau of Economic Research, 1932, Ch. VIII). From 1922 to 1929 profits and overhead charges were maintained at high levels, and the selling prices of manufactured goods failed to decline, to a degree commensurate with the increase in industrial productivity and the fall in labor costs that occurred in that period. This situation tended to reduce marketings and so contributed to the unstable situation existing in 1929. The rise in time rates of pay and in total wage payments in 1933-35, and the failure of overhead and fabricational costs to reflect the great gain in productivity that had occurred since 1929, helped to perpetuate excessively high prices of manufactured goods. (The fabricational costs which thus remained high were not restricted to labor costs. The fact that labor costs did no more than parallel changes in selling prices, when material costs were relatively low indicates that other fabricational charges, such as overhead costs, remained on the same high level as labor costs.) The advance in the prices of these goods, at a time when such goods were already over-valued, retarded a needed expansion in the volume of sales. During the decade of the 'twenties a high manufacturing differential (profits are here included with the differential) was a factor in preventing the *maintenance* of a large volume of production and sales. From 1933 to 1935 a high manufacturing differential was a factor in preventing the *restoration* of a large volume of production and sales.

We are far from knowing all the conditions essential to the steady and efficient operation of a modern industrial economy. But experience during the last ten years seems to justify one general conclusion. The immediate passing on to consumers of a major part of the benefit of increasing industrial productivity, in the form of lower prices, contributes directly to the maintenance of industrial operations on a high level, and to the raising of the standard of living of the people at large. Action designed to procure for special groups the advantages of increasing industrial productivity, or action tending to decrease industrial productivity and advance costs, runs the grave danger of defeating its own purpose, through setting barriers to the maintenance (or the restoration) of the volume of production and employment that is essential to the general welfare.

APPENDIX A

NOTE ON SOURCES OF DATA AND CONSTRUCTION OF INDEXES

Production: Index numbers are constructed by the Federal Reserve Board from 55 individual series of data representing the production of about 34 industries and estimated to represent, directly or indirectly, about 80 per cent of the total industrial production of the United States. The figures are reduced to a daily average output and are presented to show the actual production. No correction for seasonal movements has been made in the index numbers here employed. The monthly average for 1923-25 is the base.

Number employed and payrolls: Index numbers are constructed by the United States Bureau of Labor Statistics. The basic data are supplied by representative establishments in 90 important manufacturing industries of the country. For November, 1934, reports were received from over 25,000 establishments employing more than 3,550,000 workers, whose weekly earnings were about 70 million dollars during the pay period ending nearest the 15th of the month. The employment reports received cover more than 50 per cent of the total wage-earners in all manufacturing industries of the country. The three-year average, 1923-25, equals 100.

Average hours worked per week: The index numbers are constructed from data compiled by the United States Bureau of Labor Statistics. The reports come from a smaller number of establishments than are covered in the monthly survey of manufacturing industries. Not all reporting establishments furnish man-hour information. The figures are presented for only those manufacturing industries (78 in number) for which available information covers at least 20 per cent of all the employees in the industry.

Prices: Index numbers are computed by the National Bureau of Economic Research from wholesale prices compiled by the United States Bureau of Labor Statistics. The weighted index for manufactured goods includes 536 price series. The average for the year 1926 is used as base. For the three earlier periods, an average of the index numbers of the wholesale prices of semi-manufac-

tured and finished goods, constructed by the United States Bureau of Labor Statistics, was used. In averaging, these were weighted 1 and 6, respectively.

For the present purpose the base of each of these index numbers has been shifted to February-March, 1933.

The index of changes in gross income is the product of indexes of changes in physical volume of production (number of units produced) and in average selling price per unit. Thus, in deriving the gross income index for June-July, 1933, we have

1.57 (production index) x 1.09 (price index) = 1.71

In the tables these measurements are given in relative, rather than in ratio, form.

The index of total employment (man-hours) is the product of indexes of number of wage-earners employed and of average number of working hours per week, per person.

The index of average output per wage-earner is secured by dividing the index of physical volume of production by the index of number of wage-earners employed.

The index of average output per man-hour is secured by dividing the index of physical volume of production by the index of total employment (man-hours).

The index of average earnings per wage-earner is secured by dividing the index of total wage disbursements by the index of number of wage-earners employed.

The index of average hourly wages is secured by dividing the index of total wage disbursements by the index of total employment (man-hours). We should note that a change in average hourly earnings may result from an actual change in wage rates, or from a shift in the relative proportions of men working at different rates, in the total labor force. An increase in the proportion of men receiving relatively high wages will raise the average, of course, without any modification of wage rates.

The index of average labor cost per unit of product is secured by dividing the index of total wage disbursements by the index of physical volume of production.

APPENDIX B

COMPARISON OF INDEX NUMBERS DERIVED FROM MONTHLY DATA WITH INDEX NUMBERS BASED ON CENSUS RECORDS, MANUFACTURING INDUSTRIES

Supporting evidence that the measurements given in the preceding pages are representative of the general movements occurring in manufacturing industries of the United States is furnished by a comparison, by Census periods, of index numbers derived from the monthly series here utilized with index numbers based directly upon much more comprehensive Census records. For employment and payroll statistics the series compared are not independent, prior to the 1931-33 period, since the monthly records of the Bureau of Labor Statistics have been adjusted to biennial Census records. This process of adjustment, of course, helps to validate the measurements for the earlier periods, which are given in the text.

	1921	*1923*	*1923*	*1925*	*1925*	*1927*	*1927*	*1929*	*1929*	*1931*	*1931*	*1933*
PHYSICAL VOLUME OF PRODUCTION												
Index of National Bureau of Economic Research, based on Census data[1]	100	146	100	102	100	103	100	113	100	75	100	93
Index of Federal Reserve Board[2]	100	151	100	104	100	101	100	112	100	67	100	94
AVERAGE SELLING PRICE OF PRODUCTS												
Index of National Bureau of Economic Research, based on Census data	100	99	100	99	100	94	100	98	100	78	100	85
Index of United States Bureau of Labor Statistics	100	100	100	99	100	94	100	99	100	81[3]	100	93[3]
NUMBER OF WAGE-EARNERS EMPLOYED												
Census	100	126	100	96	100	100	100	106	100	74	100	93
United States Bureau of Labor Statistics	100	126	100	96	100	100	100	106	100[3]	74	100	89
TOTAL WAGE DISBURSEMENTS (PAYROLLS)												
Census	100	134	100	97	100	101	100	107	100	62	100	73
United States Bureau of Labor Statistics	100	136	100	97	100	101	100	107	100	62	100	72

[1] Weighted by value of product.
[2] Weighted by value added.
[3] For the last two periods the index given is that of wholesale prices of manufactured goods, constructed by the National Bureau of Economic Research.

In only four of the comparisons are there notable differences between the measurements drawn from Census records and those derived from monthly observations. Of these, three are of some concern in the present study. The monthly data on employment and payrolls show a somewhat greater change, from 1931 to 1933, than do the Census measurements. Again, the 1931-33 decline in realized prices, as defined by the Census records, appears to have been greater than the decline in the quoted prices compiled by the Bureau of Labor Statistics. In the two former cases greater stability is found in the more broadly-based Census records. (This same condition, it may be noted, is found in the production records over times of rapid change, as from 1929 to 1931.)

It is difficult to gauge the possible effects of these conditions on the measurements relating to the 1933-35 recovery. The greater steadiness of the figures for all manufacturing industries would tend to make total production, total employment and total payrolls rise somewhat less rapidly than do production, employment and payrolls relating to the sample available for monthly study. On the other hand, a tendency to understate the degree of advance in employment and payrolls, during revival, arises from the use of a fixed sample in the Bureau of Labor Statistics compilations. For the results of the operations of new enterprises are necessarily excluded from such compilations. A comparison of Census records with averages of uncorrected monthly figures indicates that the negative bias is probably the more important, for employment and payrolls. This would mean that the advance recorded in the various tables understates the actual advance of these series in 1933-35. Such bias as is present in the monthly production figures probably works toward an overstatement of the actual advance, because of the greater steadiness of the total. As regards prices, however, it is probable that actual realized prices have risen somewhat more rapidly than the quoted prices indicate.

In general, the above comparison of the two sets of basic data confirms the accuracy of the measurements based on monthly records. The fluctuations in the monthly records are probably wider (with the exceptions noted) than those that would be found in more broadly-based index numbers, but the general directions of movement and the relations among the different measurements are definitely similar.

This paper is a by-product of Dr. Mills' study of the price aspects of recession and recovery which the National Bureau hopes to publish within the year. To round out the discussion of price changes, production movements and changes in purchasing power will also be treated in the book.

The report will deal with the fortunes of four major economic groups—producers of primary products, those engaged in manufacturing operations, producers of capital equipment, and consumers—as they were affected by the forces of contraction and by the conflicting currents of the years 1933 to 1935. Primary producers have been in a peculiar position since the World War, and their difficulties were accentuated by the recession of 1929. Manufacturing industries have enjoyed notable gains in productivity and have faced exceptionally difficult problems of readjustment brought about by drastic changes in price levels. The heavy industries, as a special class, are always in a position of strategic importance during depression and recovery. And consumers, at the terminal stage of economic activity, have been greatly affected by the shifting tides of business activity. Alterations in the purchasing power of important consuming groups have played a role of critical importance in the events of the last five years.

The emphasis of the study is definitely upon the price system, as it functioned during a period of severe recession and depression, and as it reacted to the stimulus of changes in monetary and other conditions. In some respects this report will be a continuation of the story told by ECONOMIC TENDENCIES, *which dealt with the modifications occurring in the domestic economy of the United States during periods of expansion prior to and following the World War. The present study is more sharply focussed, however, upon price phenomena. It departs from the pattern of the earlier book also in that it gives some attention to changing world conditions since 1929.*

TRADE BOOK DESIGN, 1934-1935

Mechanization in Industry, by Harry Jerome, published by the National Bureau in 1934, has been included in the American Trade Book Design Exhibition, 1934-1935, as "an intelligently planned and well-executed technical book." The exhibition, which is sponsored by the American Institute of Graphic Arts, opened at the New School for Social Research, 66 West 12th Street, New York, on May 7, and will continue for two weeks. Efforts are being made to have booksellers throughout the country arrange duplicate exhibitions in order to stimulate interest in the problems of bookmaking and design.

Since only twenty-five books were chosen out of over two hundred submitted by publishers the selection of a National Bureau book is recognition of the care with which its books are manufactured. Ernst Reichl, of H. Wolff Book Manufacturing Company, which printed and bound the book, is the designer.

STAFF PLANS

David L. Wickens, who is known for his work on the farm mortgage studies of the Bureau of Agricultural Economics, and who recently supervised the analysis of 350,000 questionnaires concerning urban real estate financing in sixty-five cities obtained by the Real Property Inventory—a Civil Works Administration project sponsored by the Department of Commerce—has joined the National Bureau staff as an Associate. He is in charge of the study of Real Estate Financing and Economic Stability, which the National Bureau has undertaken at the request of the Social Science Research Council, Committee on Credit and Banking of the Division of Industry and Trade, of which Dr. David Friday is Chairman. Dr. Wickens has a staff at work in Washington.

The appointment of Oswald W. Knauth to direct the organization administering relief in New York City makes it necessary to postpone plans for his early return to the National Bureau staff.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

OSWALD W. KNAUTH, *Chairman*
JOSEPH H. WILLITS, *President*
CHARLES A. BLISS, *Executive Secretary*
GEORGE SOULE, *Vice-President*
SHEPARD MORGAN, *Treasurer*
MARTHA ANDERSON, *Editor*

Research Staff

WESLEY C. MITCHELL, *Director*
ARTHUR F. BURNS
SIMON KUZNETS
F. R. MACAULAY
FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, DAVID L. WICKENS, *Associates*

Directors at large

OSWALD W. KNAUTH
H. W. LAIDLER
L. C. MARSHALL
GEORGE O. MAY
ELWOOD MEAD
SHEPARD MORGAN
GEORGE SOULE
N. I. STONE

Directors by University appointment

EDWIN F. GAY, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors appointed by other organizations

FREDERICK M. FEIKER, *American Engineering Council*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
GEORGE E. ROBERTS, *American Bankers Association*
M. C. RORTY, *American Statistical Association*
ARCH W. SHAW, *National Publishers Association*

Business Profits

Excerpts from reviews of INDUSTRIAL PROFITS IN THE UNITED STATES, by Ralph C. Epstein (678 pp., 123 tables, 69 charts, $5)

New York Daily Investment News, March 12, 1935

"Dr. Epstein has done a remarkably fine job, and his study should be in the hands of all those who want to know about American business. It will aid those interested in stocks as well, for too few investors have a clear idea of the forces that go to make earnings, and the general characteristics of corporation earnings in this country.

Indeed, prior to the publishing of this book there was no equally good volume on the subject. It is no longer necessary to guess as much as before, and, if one is really interested in the subject of earnings and is willing to do some work in finding out the facts, the reading of this book should be of great value. Do not, however, expect a 'popularization' of the facts. Dr. Epstein does not 'sugar-coat' his material. He presents long and intricate tables.

The book is recommended heartily by this reviewer as a genuinely valuable contribution to economic knowledge."

The Annalist, December 28, 1934

"This is an attempt, among other things, to answer one of the most fundamental and most controversial questions of the day, namely, what is the long-run rate of return on invested capital. Economists have in the past answered the question on the basis of economic theory, and statisticians have answered it on the basis of available figures. Although few informed observers, or Professor Epstein himself, would be prepared to state that this book gives a complete and unequivocal answer, it is undoubtedly the most thorough piece of research work yet done on the problem and rests on the most elaborate set of earnings figures ever compiled."

Dun and Bradstreet Monthly Review, April 1935

"Many efforts have been made to ascertain what rates of profit business enterprises earn upon the capital invested, and how these rates fluctuate. The task is important because the fortunes of millions of employees, investors, managers, and consumers fluctuate as the prospects of profits grow brighter or darker.

But the task is also exceedingly difficult; for profits vary widely from year to year in the same enterprise; in a given year they vary widely from one enterprise to another in the same industry; also some indutsries, taken as a whole, flourish in years when other industries languish. To get trustworthy results, it is necessary to include a large number of identical enterprises, engaged in many lines of business over a considerable period of years.

Dr. Epstein has secured fuller and better data concerning profits than any of his predecessors. For 2,046 manufacturing and for 664 trading corporations he has an unbroken record of income statements for each of the years 1919-1928. Supplementary statements for 71 corporations carry the record through 1932. With these materials at his disposal, Dr. Epstein is able to make knowledge of business profits wider, more definite and more secure."

CORPORATE PROFITS AS SHOWN BY AUDIT REPORTS, by W. A. Paton (151 pp., 10 tables, 5 charts, $1.25)

Copies of this book, Volume 28 in the National Bureau publications series, have been distributed to subscribers and are now on sale. Although fewer corporations are covered than in Dr. Epstein's sample and the period studied is shorter, the individual statements give fuller details. For these financial statements the National Bureau is indebted to cooperating members of the American Institute of Accountants. The preface by Mr. George O. May points out that much might be learned about the workings of our economic system if a broadly representative sample of audited financial statements could be made available for analysis year after year.

Recent Books

23. PRODUCTION TRENDS IN THE UNITED STATES SINCE 1870 (1934)
By Arthur F. Burns — 363 pp., $3.50

24. STRATEGIC FACTORS IN BUSINESS CYCLES (1934)
By John Maurice Clark — 238 pp., $1.50

25. GERMAN BUSINESS CYCLES, 1924-1933 (1934)
By Carl T. Schmidt — 283 pp., $2.50

26. INDUSTRIAL PROFITS IN THE UNITED STATES (1934)
By R. C. Epstein — 678 pp., $5.00

27. MECHANIZATION IN INDUSTRY (1934)
By Harry Jerome — 484 pp., $3.50

28. CORPORATE PROFITS AS SHOWN BY AUDIT REPORTS (1935)
By W. A. Paton — 151 pp., $1.25

29. PUBLIC WORKS (in press)
By Arthur D. Gayer — 484 pp., $3.00

National Bureau of Economic Research

BULLETIN 57

JULY 1, 1935

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

The National Bureau's Measures of Cyclical Behavior

WESLEY C. MITCHELL
and
ARTHUR F. BURNS

Copyright 1935, National Bureau of Economic Research, Inc.

I. THE PURPOSE FOR WHICH THE MEASURES ARE MADE

BUSINESS cycles consist of interrelated fluctuations in many economic processes—the production of commodities by farmers, miners and manufacturers; the transporting of freight and passengers by land and water; the pricing of commodities at successive stages of their journeys to business enterprises and households; marketing merchandise at home and abroad; carrying stocks of raw materials and finished products; employing men and disbursing wages; borrowing money and paying interest; making profits or losses and declaring dividends; saving and investing capital; paying current expenses and maturing debts with money or bank credit. That the cyclical fluctuations in these diverse processes differ from one another in timing, amplitude and relationship to the expansions and contractions of general business has been known; but the knowledge has been piecemeal and vague for the most part. Thus economists have had to construct their theories of business cycles without adequate knowledge of the phenomena they were trying to explain, and without adequate means of testing the relations between their hypotheses and what actually happens.

The rapid accumulation of statistical data in recent years is making it possible to work in a more satisfactory fashion. Investigators with adequate resources can now find out the manner in which many economic processes behave with reference to business cycles. By combining what they learn about different processes, they can get a far clearer idea than their predecessors had of the facts to be explained. On the basis of the fuller knowledge of what business cycles are, they should be better able to make tests of existing hypotheses, to devise new ones, and so to improve upon earlier theoretical work.

The National Bureau laid the basis for such an effort in *Business Cycles: The Problem and Its Setting.* Since that volume appeared in 1927, a small staff has been developing a technique for measuring cyclical behavior and has been applying it to some eight hundred time series from the United States, Great Britain, France and Germany.[1] The task of rechecking this analysis and bringing it up to the close of the last completed cycles in the four countries should be finished before the end of the year.

This *Bulletin* gives a brief explanation of the leading features of the technique and a few illustrations of the results. The first three chapters of the book in preparation—*Business Cycles,* Volume II, *Analysis of Cyclical Behavior*—will be available in mimeographed form by August or September. They explain the technique in full detail, interpret the meaning of the results and appraise their representative value. It is expected that Volume II will be published before the close of 1936. The final volume, the *Rhythm of Business Activity,* will follow some time later. This volume will present a theoretical account of how business cycles come about, and it is for this ultimate use that the National Bureau's measures of cyclical behavior are made.

II. THE BASIC UNIT OF THE INVESTIGATION

Each business cycle that runs its course in any country offers one opportunity to observe cyclical phenomena in their mixture of similarities and differences. The more of these units we can observe, the better our chance of disen-

[1] Besides the present writers, Dr. Simon Kuznets has taken an active part in developing the technique. The task of applying it to time series has been supervised by Miss Cicely Applebaum. The assistants who have shared in the work are Mr. H. I. Forman, Miss S. Sakowitz, Mr. D. Volkenau, Miss F. Goldberg, Mr. K. Laubenstein, Mr. W. Friedman, Mr. E. Otto, Mr. C. Wittmann, Miss D. Cook, Mr. W. Levin, Mr. G. Miron, Mr. S. Rubin, and Mr. R. Vernon.

gaging cyclical fluctuations from the random movements with which they are intertwined; the better our chance, also, of finding out how uniform or how variable the cyclical component in economic changes tends to be, and how the cyclical fluctuations that occur in different countries at the same time are related to one another. But the opportunities for close observation are limited to those countries and periods for which continuous statistical series are available. It would be possible and highly desirable to cover more than four countries; it would be possible also to work this restricted field more intensively than we have done. Both the extensive and the intensive margins of cultivation have been set for us by the resources at our disposal.

III. THE MEASURES OF CYCLICAL BEHAVIOR

1. Reference Dates

To learn how different economic processes behave with reference to business cycles we must observe their movements during the revivals, expansions, recessions and contractions in general business activity. Before we can begin observing we must mark off these periods in time. Hence we have made for each of the four countries a table of 'reference dates', showing the months and years of the troughs and peaks of successive business cycles. We based these tables first upon the *Business Annals,* compiled for the National Bureau by Dr. Willard L. Thorp; then we refined, tested and at need amended the dates by studying whatever statistical series are available for the four countries at different periods. 'General business activity' is a concept that can be made more definite as the field covered by economic statistics expands. Hence we have more confidence in the accuracy of our reference dates for the United States than for the three European countries, and more confidence in the later than in the earlier dates.

2. Reference Cycles and Specific Cycles

After eliminating the seasonal variations of a series, we break it into segments marked off by the reference dates for the country from which the series comes. Then we compute the average of the monthly values during each 'reference cycle' and convert the data into percentages of this base; we call these percentages 'reference-cycle relatives'. The application of a uniform set of dates to all series for a given country and the reduction of the original data expressed in diverse units to relatives of their average values during the periods thus marked off put all the materials into comparable form and enable us to see how different processes behave during successive business cycles in our four countries.

While our interest centers in this picture of what happens in the course of a business cycle, it reaches out to other matters. On working with our series we find that almost all of them have cyclical fluctuations, but that these fluctuations bear widely different relationships in time to business cycles. The cyclical movements found in a series, what we call its 'specific cycles', may have turning dates that differ little from our reference dates, or that usually lead or lag behind the reference dates by brief or by considerable intervals, or that have no regular relationship to the reference dates. Now the course of business cycles is influenced by cyclical fluctuations in every economic process, whether or not these fluctuations harmonize with the general tides of activity. Hence, to lay a satisfactory basis for a theory of business cycles, we must supplement our analysis based upon business-cycle periods by studies of the specific cycles peculiar to each series.

To that end, we look in every series for wave-like movements, the duration of which is of the same order of magnitude as that of business cycles. In most series the dates of the troughs and peaks of the specific cycles are clearly defined, but in some series they are obscured by random or secular movements. We mark off the specific cycles by the dates of their turning points as well as we can; compute the average value of the data during each cycle, and make a second set of relatives, corresponding in character to the reference-cycle relatives, except that the new set shows movements during specific cycles.

Table 1 and Chart 1 illustrate these steps. The table shows by months the seasonally adjusted figures of total coke production in the United States from 1914 through 1933—a series chosen because it is short and presents few of the complications that we ordinarily encounter. These figures are plotted on the chart, which shows also the turning points of business cycles and of the specific cycles in coke production. The average monthly production of coke during the first specific cycle (December 1914 to May 1919) was 4,256,000 net tons. With that figure as a base, we convert the monthly values shown by Table 1 for the months covered by this cycle into specific-cycle relatives. The first reference cycle covered by this series runs from January 1915 to April 1919. The average monthly output during that period was 4,316,000 net tons, which is the base upon which the first set of reference-cycle relatives is computed. During the second specific cycle (June 1919 to July 1921) the average monthly output was 3,502,000 net tons; during the second reference cycle (May 1919 to September 1921) it was 3,367,000 net tons. These figures are the bases upon which relatives are computed for the second specific and the second reference cycle. All of the eight tables shown below are made by using the turning points marked on Chart 1.

3. Measures of Timing and Duration

Our tables of reference dates yield measures of the durations of business cycles and of their phases of expansion and contraction. The dates of the cyclical turning points in a given series yield similar measures of the durations of its specific cycles. By comparing the turning points of specific

TABLE 1

PRODUCTION OF COKE, UNITED STATES, 1914-1933[1]

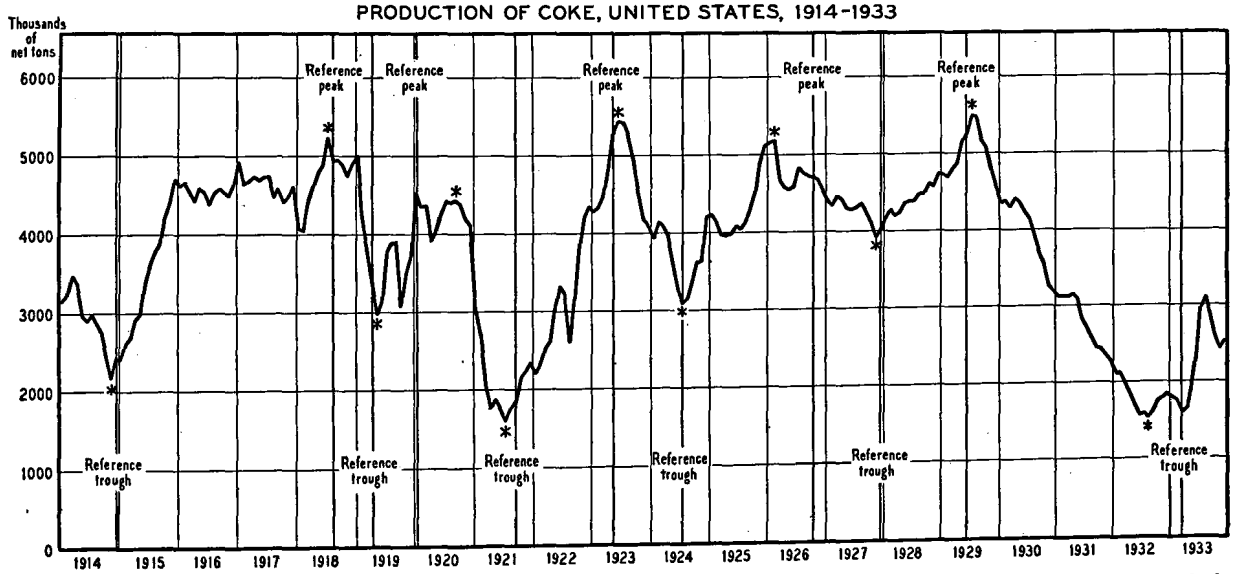
(In thousands of net tons)

	Jan.	*Feb.*	*March*	*April*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
1914	3128	3215	3476	3364	2940	2867	2991	2841	2742	2459	2150	2419
1915	2400	2610	2675	2897	2990	3376	3613	3759	3880	4198	4387	4693
1916	4609	4662	4554	4425	4581	4535	4392	4529	4591	4524	4503	4637
1917	4907	4620	4672	4720	4693	4730	4731	4475	4600	4413	4487	4589
1918	4056	4042	4415	4639	4801	4891	5228	4918	4934	4875	4749	4874
1919	5011	4215	3773	3335	2977	3141	3777	3870	3865	3068	3529	3735
1920	4554	4353	4360	3885	4031	4255	4412	4403	4431	4369	4200	4093
1921	3043	2662	2048	1749	1879	1752	1595	1762	1850	2160	2254	2338
1922	2195	2317	2560	2638	3009	3317	3236	2597	3150	3785	4187	4342
1923	4269	4330	4512	4878	5302	5441	5407	5274	4995	4538	4174	4107
1924	3928	4144	4078	3959	3617	3242	3092	3160	3371	3606	3632	4182
1925	4223	4112	3961	3964	3990	4068	4052	4130	4317	4508	4885	5087
1926	5142	5171	4658	4580	4552	4588	4820	4750	4721	4695	4665	4540
1927	4384	4335	4437	4419	4304	4276	4307	4351	4241	4107	3887	4031
1928	4166	4259	4197	4236	4364	4368	4375	4480	4468	4614	4569	4735
1929	4728	4699	4798	4858	5148	5257	5473	5460	5156	5059	4761	4547
1930	4354	4388	4306	4427	4374	4272	4125	3936	3691	3549	3280	3225
1931	3133	3127	3128	3170	3106	2841	2738	2601	2471	2450	2356	2300
1932	2108	2128	1999	1890	1726	1602	1619	1570	1647	1775	1817	1864
1933	1815	1779	1631	1670	1911	2338	2984	3119	2888	2601	2438	2545

[1] The figures are adjusted for seasonal variations.

CHART I

PRODUCTION OF COKE, UNITED STATES, 1914-1933



The figures are adjusted for seasonal variations. The cyclical peaks and troughs in general business are indicated by vertical lines; the peaks and troughs in the specific cycles of coke production are indicated by asterisks.

cycles with the reference dates, we determine how regularly the specific cycles of a given series correspond in time to business cycles. When the correspondence is close, we determine the number of months by which the troughs and peaks in the series precede or follow the reference troughs and peaks.

These procedures are illustrated by Table A1. After the specific cycles have been marked off, the dates of the

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

A1. TIMING AND DURATION OF SPECIFIC CYCLES

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

	Dates of specific cycles			Lead (−) or lag (+)		DURATION OF CYCLICAL MOVEMENTS							
						Specific cycles			Excess over reference cycles			Per cent of duration of specific cycles	
	Revival	Peak	Trough	At reference peak	At reference trough	Expansion	Contraction	Full cycle	Expansion	Contraction	Full cycle	Expansion	Contraction
				mos.	*mos.*	*mos.*	*mos.*	*mos.*	*mos.*	*mos.*	*mos.*		
		(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
					−1								
1.	Dec. '14	July '18	May '19	−1	+1	44	10	54	0	+ 2	+2	81	19
2.	June '19	Sept. '20	July '21	+8	−2	16	10	26	+7	−10	−3	62	38
3.	Aug. '21	June '23	July '24	+1	0	23	13	36	+3	− 1	+2	64	36
4.	Aug. '24	Feb. '26	Nov. '27	−8	−1	19	21	40	−8	+ 7	−1	48	52
5.	Dec. '27	July '29	Aug. '32	+1	−7	20	37	57	+2	− 8	−6	35	65
Average				+0.2	−2	24	18	43	+1	− 2	−1	58	42
Average deviation				4	2	8	9	10	4	6	3	13	13

turning points are entered in column (1) of this table. The differences in months between the turning dates of the specific cycles and the reference dates (shown by Tables B1-B3) are entered in columns (2) and (3). The durations of the specific cycles and their phases are shown in columns (4)-(6). The differences between the durations of specific cycles and corresponding business cycles are given in columns (7)-(9). Finally, columns (10) and (11) express the lengths of the specific-cycle phases as percentages of the durations of the full cycles.

4. Measures of Amplitude

We measure the amplitudes of the cyclical swings by finding the rise of the specific-cycle relatives from the initial trough of a cycle to the peak and the fall from the peak to the terminal trough. In order to diminish the influence of random factors upon the amplitudes, we use three-month averages centered on the troughs and peaks. Of course, the results show rise and fall in percentages of the average value of the series during the specific cycle that is being measured.

These amplitude measures are given by Table A2 in three forms. Columns (2)-(4) show the three-month averages of the specific-cycle relatives centered at the initial trough, peak, and terminal trough. The second set of measures, given in columns (5)-(7), shows the rise from trough to peak, the fall from peak to trough, and the total rise and fall; these figures are obtained directly from the entries in columns (2)-(4). The third set of measures, given in columns (8)-(10), shows the amplitudes per month; they are obtained by dividing the figures in columns (5)-(7) of Table A2 by the corresponding duration figures in columns (4)-(6) of Table A1.

5. Measures of Secular Movements

Our method of computing cycle relatives as percentages of the average value during a reference or a specific cycle eliminates from the original data what we call the 'inter-cycle' portion of the secular trend. The 'intra-cycle' portion of the trend we make no effort to eliminate. While we should be glad to have two sets of cyclical measures, one showing cyclical movements as deviations from properly fitted trends, and the present set showing cyclical fluctuations and intra-cycle trends in combination, we cannot meet the expense of the double analysis without severely restricting the number of series we cover. Of the two sets of measurements, the one that is easier to make shows more faithfully the 'cyclical' units of economic experience in a business economy, which commonly appear as expansions followed by sharper but briefer and less considerable contractions; it therefore offers better clues to business behavior, and promises to be more useful in framing a theory of business cycles.

While we exclude the inter-cycle portions of the secular trend from the original data, we take account of them by computing the percentage rise or fall in the average value of a series from one specific cycle to the next; also from one phase of expansion to the next and from one phase of

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

A2. AMPLITUDE OF SPECIFIC CYCLES

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

Dates of specific cycles			Amplitude of cyclical movements shown by specific-cycle relatives								
			Standing			Total movement			Movement per month		
Revival	Peak	Trough	At initial trough	At peak	At terminal trough	Rise	Fall	Rise and fall	Rise	Fall	Rise and fall
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Dec. '14	July '18	May '19	55	118	74	63	44	107	1.4	4.4	2.0
2. June '19	Sept. '20	July '21	90	126	49	36	77	113	2.2	7.7	4.3
3. Aug. '21	June '23	July '24	47	148	87	101	61	162	4.4	4.7	4.5
4. Aug. '24	Feb. '26	Nov. '27	73	115	93	42	22	64	2.2	1.0	1.6
5. Dec. '27	July '29	Aug. '32	107	145	43	38	102	140	1.9	2.8	2.5
Average			74	130	69	56	61	117	2.4	4.1	3.0
Average deviation			19	13	19	21	23	27	0.8	1.8	1.1

contraction to the next. The average change from one specific cycle to the next indicates the size of the net intra-cycle trend. We take detailed account of the intra-cycle portion of the trends by computing the percentage rise or fall from the average value of a series during one phase of a specific cycle to the succeeding phase of the cycle.

In our sample of Table A3, columns (2) and (3) show the average value of the seasonally adjusted data during the phases of specific cycles, and column (4) shows the average value during full specific cycles—these being the bases on which specific-cycle relatives are computed. Columns (5) and (6) display the intra-cycle trends. Column (5) states the percentage change from the average value during a contraction to the average value during the following expansion, and column (6) states the percentage change from the average value during an expansion to the average value during the following contraction. Columns (7)-(9) display the inter-cycle trends. They show successively the percentage change from the average value during one expansion to the average value during the next expansion,

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

A3. MEASURES OF SECULAR MOVEMENTS

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

Dates of specific cycles			Average monthly standing (*in thousands of net tons*)			Per cent change from average of preceding phase of specific cycles		Per cent change from average of same phase of preceding cycle			Per cent change per month from average of same phase of preceding cycle		
Revival	Peak	Trough	Expansion	Contraction	Full cycle	Expansion	Contraction	Expansion	Contraction	Full cycle	Expansion	Contraction	Full cycle
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
. Dec. '14	July '18	May '19	4231	4366	4256		+ 3						
. June '19	Sept. '20	July '21	3979	2739	3502	− 9	−31	− 6	−37	−18	−0.2	−1.4	−0.4
. Aug. '21	June '23	July '24	3323	4197	3638	+21	+26	−16	+53	+ 4	−0.5	+1.5	+0.1
. Aug. '24	Feb. '26	Nov. '27	4187	4458	4329	0	+ 6	+26	+ 6	+19	+0.8	+0.2	+0.5
. Dec. '27	July '29	Aug. '32	4591	3270	3733	+ 3	−29	+10	−27	−14	+0.2	−0.6	−0.3
verage						+ 4	− 5	+ 4	− 1	− 2	+0.1	−0.1	−0.03
verage deviation						9	20	14	31	14	0.4	0.9	0.3

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

A4. SPECIFIC-CYCLE PATTERNS

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

	Dates of specific cycles			Averages of specific-cycle relatives at nine stages of the cycles									
				I	II	III	IV	V	VI	VII	VIII	IX	
	Revival	Peak	Trough	Three months centered on initial revival	First third	Middle third	Last third	Three months centered on recession	First third	Middle third	Last third	Three months centered on terminal revival	
					EXPANSION				CONTRACTION				
	(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
1.	Dec. '14	July '18	May '19	55	85	108	108	118	114	110	79	77	
2.	June '19	Sept. '20	July '21	94	103	119	123	124	108	61	50	50	
3.	Aug. '21	June '23	July '24	48	62	85	128	148	130	112	96	88	
4.	Aug. '24	Feb. '26	Nov. '27	74	89	93	112	111	108	104	97	93	
5.	Dec. '27	July '29	Aug. '32	108	114	122	134	144	120	84	54	45	
Average				76	91	105	121	129	116	94	75	71	
Average deviation				20	14	13	9	14	7	17	19	18	

from the average value during one contraction to that during the next, and from the average value during a full specific cycle to that during the next. Finally, columns (10)-(12) reduce the inter-cycle trends shown in columns (7)-(9) to a per-month basis, the divisors being successively the number of months from the midpoint of one expansion to the midpoint of the next expansion, the midpoint of one contraction to the next, and the midpoint of a full cycle to the next.

6. Cyclical Patterns

To show the behavior of a series during the course of its specific cycles in greater detail than in Table A2, we break each specific cycle into nine stages. Stage I covers the three months centered on the initial 'revival', which is the month following the initial trough of the specific cycle; stage V covers the three months centered on the 'recession', which is the month following the peak; stage IX covers the three months centered on the terminal 'revival'. Stages II to IV cover successive thirds of the phase of expansion, and stages VI to VIII cover successive thirds of the phase of contraction. By averaging the specific-cycle relatives for the months included in each of these stages, we get 'specific-cycle patterns'.

We make 'reference-cycle patterns' on a similar plan; but here the nine stages are marked off by the cyclical turning dates, together with the intervening periods of expansion and contraction, of general business. By breaking each reference cycle into nine stages, we show the behavior of different economic processes from stage to stage of business cycles and put both our concept of business cycles and our schedule of reference dates to a critical test. When charted the reference-cycle pattern of a series gives a vivid picture of its behavior with respect to business cycles.

Table A4 illustrates how the specific-cycle patterns are made and Table B1 how the reference-cycle patterns are made. The captions of each table indicate the manner in which the cycles are divided into stages. Table B1 is like Table A4, except that the dates of revival and recession are taken from the standard list of reference dates instead of being taken from the turning points of specific cycles, and that the entries are expressed in units of reference-cycle relatives instead of specific-cycle relatives.

Tables A5 and B2 are closely related to Tables A4 and B1. The entries in Table A5 are obtained by dividing the differences between successive figures in Table A4 by the number of months from the middle of one stage to the middle of the next stage. Table B2 is made from Table B1 just as Table A5 is made from Table A4; that is, the differences between successive entries in Table B1 are divided by the number of months between the middle of one stage and the middle of the next.

7. Rates of Change per Month

In making the cyclical patterns we pay no heed to differences in duration. A very brief business cycle like that which followed the World War (May 1919 to September 1921 in the United States) is broken into nine stages in the same fashion as is a very long cycle like that which lasted from January 1871 to March 1879. Similarly, we disregard differences of duration in measuring amplitudes

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

A5. AVERAGE RATES OF CHANGE PER MONTH FROM STAGE TO STAGE OF SPECIFIC CYCLES

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

Rate of change per month in specific-cycle relatives from stage to stage of the cycles

Dates of specific cycles			I-II Revival to first third	II-III First to middle third	III-IV Middle to last third	IV-V Last third to recession	V-VI Recession to first third	VI-VII First to middle third	VII-VIII Middle to last third	VIII-IX Last third to revival
Revival	Peak	Trough	EXPANSION				CONTRACTION			
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Dec. '14	July '18	May '19	+4.0	+1.6	0	+1.2	−2.0	− 1.3	−10.3	−1.0
2. June '19	Sept. '20	July '21	+3.0	+3.2	+0.8	+0.3	−8.0	−15.7	− 3.7	0
3. Aug. '21	June '23	July '24	+3.5	+3.3	+5.7	+4.4	−7.2	− 4.5	− 4.0	−3.2
4. Aug. '24	Feb. '26	Nov. '27	+4.3	+0.7	+3.2	−0.3	−0.9	− 0.6	− 1.0	−1.0
5. Dec. '27	July '29	Aug. '32	+1.7	+1.3	+1.8	+2.5	−3.7	− 3.0	− 2.5	−1.4
Average			+3.3	+2.0	+2.3	+1.6	−4.4	− 5.0	− 4.3	−1.3
Average deviation			0.8	1.0	1.7	1.5	2.6	4.3	2.4	0.8
Average interval in months			4.3	7.6	7.9	4.6	3.3	5.7	5.8	3.4

of cyclical rise and fall, and in measuring inter-cycle secular movements.

This procedure is dictated by our basic assumption that one business cycle in one country may be taken as a unit in a study of cyclical behavior. But these units, like most of those used in the biological and the social sciences, are variable, and part of our task is to study the character of the variations that occur. Having measured variations in duration, we should find whether they are associated with variations in amplitude, inter-cycle movements and cyclical patterns. Partly to facilitate such studies, we supplement our first measurements of these behavior traits by computing in Table A2 the rates of change per month from the troughs of specific cycles to the peaks and from the

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

B1. REFERENCE-CYCLE PATTERNS

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

Averages of reference-cycle relatives at nine stages of the cycles

Dates of reference cycles			I Three months centered on initial revival	II First third	III Middle third	IV Last third	V Three months centered on recession	VI First third	VII Middle third	VIII Last third	IX Three months centered on terminal revival
Revival	Peak	Trough		EXPANSION				CONTRACTION			
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Jan. '15	Aug. '18	April '19	57	88	106	107	114	111	115	87	73
2. May '19	Jan. '20	Sept. '21	94	103	107	117	131	125	113	54	62
3. Oct. '21	May '23	July '24	56	64	85	121	144	135	109	96	86
4. Aug. '24	Oct. '26	Dec. '27	74	90	103	109	107	102	100	95	96
5. Jan. '28	June '29	March '33	118	122	129	140	154	128	83	51	50
Average			80	93	106	119	130	120	104	77	73
Average deviation			21	15	10	9	16	11	10	19	14

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

B2. AVERAGE RATES OF CHANGE PER MONTH FROM STAGE TO STAGE OF REFERENCE CYCLES

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

Dates of reference cycles			Rate of change per month in reference-cycle relatives from stage to stage of the cycles							
			I-II Revival to first third	II-III First to middle third	III-IV Middle to last third	IV-V Last third to recession	V-VI Recession to first third	VI-VII First to middle third	VII-VIII Middle to last third	VIII-IX Last third to revival
Revival	Peak	Trough	EXPANSION				CONTRACTION			
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Jan. '15	Aug.'18	April '19	+4.1	+1.3	+0.1	+0.9	−2.0	+2.0	−11.2	−7.0
2. May '19	Jan. '20	Sept. '21	+6.0	+1.6	+3.3	+7.0	−1.7	−2.0	− 9.1	+2.0
3. Oct. '21	May'23	July '24	+2.3	+3.5	+5.5	+5.8	−3.6	−6.5	− 2.9	−3.3
4. Aug.'24	Oct. '26	Dec. '27	+3.6	+1.5	+0.7	−0.4	−2.0	−0.5	− 1.1	+0.3
5. Jan. '28	June '29	March'33	+1.3	+1.3	+1.8	+4.0	−3.5	−3.1	− 2.1	−0.1
Average			+3.5	+1.8	+2.3	+3.5	−2.6	−2.0	− 5.3	−1.6
Average deviation			1.3	0.6	1.7	2.6	0.8	2.2	3.9	2.8
Average interval in months			4.0	7.3	7.8	4.5	3.5	6.1	6.6	4.0

peaks to the troughs; by computing in Table A3 the rates of change per month from the average value of a series in one specific cycle to the average value in the next; and by computing in Tables A5 and B2 the rates of change from stage to stage in each specific and each reference cycle.

5. Measures of Conformity to Business Cycles

The comparisons between the timing and duration of specific and reference cycles show roughly whether the wave-like movements in a given series do or do not conform regularly to the waves in general business activity. Further light is shed upon this problem by the similarity or the difference between the specific-cycle and the reference-cycle patterns of a series. But it is desirable to measure explicitly the varying degrees of conformity.

For this purpose we study the movements of a series from stage to stage of successive reference cycles, endeavoring to find during what reference stages the series commonly expands and during what stages it commonly contracts. The typical period of rise may be, let us say, from stages I to V, from VIII to IV, or from VIII to V. In any of these cases we say that the stages during which the series typically rises are 'associated with reference expansion', implying that the remaining stages are 'associated with reference contraction'. Whatever division of the stages is chosen is applied uniformly in the later operations to all the reference cycles covered by a series.

We make two sets of measures of conformity. The first set shows the average rate of change per month during the reference-cycle stages associated with reference expansion, during those associated with reference contraction, and the difference between these two rates of change. This third result is needed because some series with rapidly rising trends at times continue to advance even during the stages associated with reference contraction, and we wish to show how much, if at all, the rate of rise is accelerated during expansions in general business and retarded during contractions.

While the average rates of rise or fall shown by the first set of conformity measures are useful, they do not indicate the *regularity* with which a series responds to the stimuli of general business expansion and contraction. To bring out this feature of cyclical behavior as well as may be, we make 'indexes of conformity'. These show uniformity or lack of uniformity in the direction of movement, but take no account of magnitude of change. When a series rises during the stages associated with reference expansion in one cycle, we mark it +100; when the series remains unchanged, we mark it 0; when it falls, we mark it −100. We cast up the algebraic sum of these entries and divide by their number. The result varies between +100 (positive conformity in all the reference cycles covered) and −100 (inverse conformity in all the cycles). An equal number of positive and inverse movements produces an index of 0. An 'expansion index' of +50 means positive conformity in 3 and inverse conformity in 1 case out of 4; one of +33 means positive conformity in 2 and inverse conformity in 1 case out of 3. For conformity during the stages associated with reference contraction we make a

'contraction index' in a similar way, but now a decline is marked +100 and a rise —100; for a decline means positive conformity to reference contractions and a rise means inverse conformity. Finally, we make indexes of conformity to business cycles as wholes. In doing this we allow for the fact that some series rise or decline throughout business cycles, but at a different rate during reference expansions and contractions. We attain a preliminary 'business-cycle index' by crediting each difference between the rates of change per month during the stages associated with reference expansion and contraction with +100 when the difference is minus, with —100 when it is plus, and then striking an arithmetic mean of these entries. Since this index shows merely the conformity to business cycles considered as running from trough to trough, we supplement it by another index showing conformity to business cycles considered as running from peak to peak. A weighted average of the two preliminary indexes gives us the final 'business-cycle index'. An index of +100 means that the rate of change per month during the stages associated with reference contraction is without exception algebraically lower than the rate of change during the next preceding and following reference expansions.

Table B3 presents these measures for coke production. We read in the captions that 'expansion covers stages I-V' and that 'expansions are related to reference expansions'. This means that the typical period of expansion of coke production is from stage I to stage V of the reference cycles, that the movements of the series during these reference stages are associated with reference expansion, and that the movements from stages V to IX are associated with reference contraction. Column (2) states for each reference cycle the interval from the middle of stage I to the middle of stage V, and column (4) states the interval from the middle of stage V to the middle of stage IX. Column (3) shows the average change per month from the middle of stage I to the middle of stage V, and column (5) shows the average change per month from the middle of stage V to the middle of stage IX; the first is obtained by dividing the entries of column (2) into the differences between the standings in stages I and V as shown in Table B1, and the second is obtained by dividing the entries of column (4) into the differences between the standings in stages V and IX. Column (6) shows the excess of the entries in column (5) over those in column (3). The average rates of change per month, which constitute our first set of conformity measures, are recorded below the entries for individual cycles in columns (3), (5) and (6).

The conformity indexes shown at the bottom of Table B3 constitute our second set of conformity measures. The

TABLE 2

SAMPLES OF THE TABLES USED IN MEASURING CYCLICAL BEHAVIOR

B3. MEASURES OF CONFORMITY TO BUSINESS CYCLES

PRODUCTION OF COKE IN THE UNITED STATES, 1914 TO DATE

(Expansion covers stages I-V. Expansions are related to reference expansions.)

	Dates of reference cycles			Average change of reference-cycle relatives during stages associated with: Reference expansion		Reference contraction		Average change for reference expansion subtracted from average change for reference contraction
	Revival	Peak	Trough	Interval in months	Average change per month	Interval in months	Average change per month	
		(1)		(2)	(3)	(4)	(5)	(6)
1.	Jan. '15	Aug. '18	April '19	44.0	+1.3	8.0	—5.1	—6.4
2.	May '19	Jan. '20	Sept. '21	9.0	+4.1	20.0	—3.4	—7.5
3.	Oct. '21	May '23	July '24	20.0	+4.4	14.0	—4.1	—8.5
4.	Aug. '24	Oct. '26	Dec. '27	27.0	+1.2	14.0	—0.8	—2.0
5.	Jan. '28	June '29	March '33	18.0	+2.0	45.0	—2.3	—4.3
Average					+2.6		—3.1	—5.7
Average deviation					1.3		1.3	2.1
Index of conformity to								
Reference expansions					+100			
Reference contractions							+100	
Business cycles (low to low)								+100
Business cycles (high to high)								+100
All business cycles								+100

expansion index is based on the signs of the entries in column (3), the contraction index is based on the signs in column (5), and the index of conformity to business cycles considered as running from trough to trough is based on the signs in column (6). The index of conformity to business cycles considered as running from peak to peak requires in most series some special computations, but in our sample series it is obvious from the distribution of signs in columns (3) and (5) that this index is +100. The index of conformity to all business cycles, or the final business-cycle index, is a weighted average of the two preliminary indexes, the weights being proportionate to the number of cycles covered by each.

9. Averages and Average Deviations

All the measures described above are made for every reference and for every specific cycle covered by a series. These figures for individual cycles show net changes produced by the interaction of cyclical fluctuations, intra-cycle trends and random perturbations. So long as the cycles are considered one at a time, there is no way of telling what part of the net changes is due to each of these three components. But when averages are struck for all the cycles covered by a series, features peculiar to single cycles tend to fade away, while features common to all the cycles tend to stand out clearly.

Averaging of this sort is our preliminary device for dealing with that most difficult problem of time-series analysis: how to segregate cyclical fluctuations from random perturbations. In general, the larger the number of cycles covered by an average, the more probable it is that the random perturbations of individual cycles will cancel one another. Hence we feel more confidence in our measures of cyclical behavior made from long series than in those made from short ones. But in analyzing price and value series, we exclude from our averages the cycles affected by the monetary changes that occurred during and soon after the Civil War and the World War. We make exclusions in a few other cases when some exceptionally powerful random factor, such as a great coal strike, has warped an individual cycle out of resemblance to the other cycles of its array.

Intra-cycle trends, like random perturbations, tend to disappear in the averages when their direction changes within the period covered by our analysis. These cases, however, are few. Except when we use series from which the compilers have eliminated secular trends, we commonly get averages that show cyclical fluctuations and intra-cycle trends in combination. The trend factor stands out clearly in the upward or downward tilt of most of the cyclical patterns shown by Charts 2-6.

Our attempt to find what cyclical behavior is characteristic of different economic processes does not end in contemplation of average measures; for one of the leading characteristics of actual business cycles is that they vary in duration, intensity and other features. To keep this characteristic prominently before our minds and to provide materials for studying it at a later stage of the investigation, we compute the average deviations from our averages. These deviations are simple measures of the degree in which the figures for individual cycles in a series are clustered about the arithmetic means that we use to represent 'central tendencies'. Random perturbations enter prominently into the average deviations; any changes that occur in the cyclical component proper do likewise, also whatever changes occur in intra-cycle trends, and so too whatever seasonal variations escape our efforts to eliminate them.

IV. CONSTRUCTION OF THE CHARTS

We have devised standard charts of cyclical patterns that show most, though not all, of our measures of cyclical behavior. Since in this *Bulletin* we base our illustrations of results mainly upon the charts, it is necessary to describe their construction in detail. The reader will do well to check this description against any of the charts that follow —preferably Figure 23 showing coke production.

The Captions

We state on the charts the number of specific and reference cycles included in the cyclical patterns, the periods covered, and the conformity indexes. In the chart showing the cyclical patterns of coke production we find the legend 'Conformity: +100, +100, +100'. The first figure is always the index of conformity to reference expansions; the second is the index of conformity to reference contractions; the third is the final index of conformity to whole business cycles.

The Time Scales

The average durations of the specific and reference cycles are represented by the long horizontal lines above and below the cyclical patterns.

The short horizontal lines above and below these time scales show the average deviations from the average durations.

The time scales showing the average duration of specific and reference cycles are broken by nine vertical lines dropped from or erected at the midpoints of the stages into which we divide both sets of cycles. The distances between the vertical lines correspond to the average time intervals between the midpoints of successive cycle-stages. The verticals at recession are extended through the time scales in order that the eye may quickly find this stage.

Cyclical Patterns and Amplitude Scales

The vertical scale at the left of the chart runs in units of cycle relatives; that is, percentages of the average value of the series during a specific or a reference cycle. With the

aid of this scale, the amplitude of the cycles can be read.

The two curves show the specific-cycle and reference-cycle patterns derived by averaging the standings at the nine successive stages into which individual cycles are divided.

The lengths of the vertical lines show the average deviations of the individual cycles from their average standings at the nine stages plotted.

In dealing with series that run by years instead of months or quarters, it is not feasible to break the reference and specific cycles into nine stages. We make five-stage instead of nine-stage patterns in these cases. The first stage represents the initial trough of a cycle, the second represents mid-expansion, the third the peak of the cycle, the fourth mid-contraction, and the fifth the terminal trough.

Leads and Lags

When the specific and reference cycles correspond to one another, the two time scales are so placed with reference to one another that they show the average lead or lag of the turning dates of specific cycles in relation to the turning dates of business cycles.

An arrow drawn from the revival (or the recession) of the specific-cycle pattern to the revival (or the recession) of the reference-cycle pattern means that we consider the average lead or lag of the specific cycles at that point a representative average. When the arrays of leads or lags at a cyclical point seem to have no clear central tendency, no arrow appears. A vertical arrow signifies a significant coincidence in average timing.

When the specific and reference cycles do not correspond to one another, the two time scales are arbitrarily placed so that the recession of the specific-cycle pattern and that of the reference-cycle pattern fall on the same vertical line. In these cases, the charts do not show leads or lags.

Uniformity of Scales

In the charts strict uniformity is maintained in both the time and the amplitude scales. Hence the features of one chart can be compared directly with the similar features of any other chart.

However, in making comparisons, it must be remembered that charts drawn from annual data show coarser time scales and lower amplitudes than charts from monthly data.

V. ILLUSTRATIONS OF RESULTS

All that a time series can reveal directly is the cyclical movement in a particular process—mining coal, clearing checks, pricing of securities, and so on. Even index numbers—whether of prices, production, or 'general business'—represent merely average changes within limited ranges of activities. Yet it is only through time series of restricted significance that business cycles manifest themselves definitely enough to be measured. To obtain quantitative knowledge of the wholes we must first gain quantitative knowledge of the parts. Charts 2-6 represent a small sample of the 'parts' that the National Bureau has been investigating in an endeavor to determine what sort of 'wholes' business cycles are.

1. A Few Aids in Reading the Charts

The charts will at first seem puzzling even to a person who has taken the trouble to study the manner in which they are constructed. But the reader will soon learn how to use them if he bears in mind the following points. (1) The specific-cycle and reference-cycle patterns cover periods that are as nearly the same as the varying turning dates of specific and business cycles permit. (2) The representative value of the patterns is indicated by the vertical lines showing average deviations and by the captions stating the number of cycles covered. (3) Even when the number of cycles is large and the average deviations are small the full significance of the patterns cannot be known without close study of the quality of the original data, the arrays from which the patterns are made, and the many measures we compute but do not record on the charts. (4) In the main the differences among the charts reflect typical differences in cyclical behavior, but to some extent they are connected with the varying periods covered by the series. (5) As already stated the time scales show average leads or lags at reference turns only when there is a one-to-one correspondence of specific and reference cycles. Identity of number of cycles is a necessary but not a sufficient condition for correspondence; thus two short specific cycles may correspond to one reference cycle and one long specific cycle to two reference cycles. (6) Most important of all, the amplitude of the reference-cycle pattern relatively to that of the specific-cycle pattern provides a quick clue to the relationship in time of a given series to business cycles. If the turning dates of the specific cycles are virtually coincident with the reference dates, the two patterns will be nearly the same. If the turning dates of the specific cycles differ from the reference dates by tolerably regular intervals, the two patterns will be much alike when allowance is made for the difference in timing. But if the timing of the specific cycles is relatively independent of that of business cycles, then what may have been a large amplitude in the specific-cycle pattern will be obscured or disappear entirely in the reference-cycle pattern.

2. Indicators of General Business

Chart 2 shows the cyclical patterns of several series that are often regarded as 'indicators of business conditions'. They are introduced by the familiar index of industrial activity in the United States, constructed by the American Telephone and Telegraph Company. This series is one of the few that we treat in a form adjusted for secular trend and it is the only such series in the present list. The

slight downward tilt of its cyclical patterns is accounted for entirely by the severity of the recent depression. The contraction phase of the specific cycles is briefer, but marked by a more rapid rate of movement, than the expansion phase. The average amplitude of the specific cycles is moderate in relation to most series showing output of individual commodities. However, the amplitude is larger than what would be found in a comprehensive index of production or employment. Though the A. T. & T. index tends to lead slightly at business revivals, its movements conform closely to fluctuations in general business activity. This is shown graphically by the resemblance which the reference-cycle pattern bears to the specific-cycle pattern, and is confirmed by the conformity indexes and by the one-to-one correspondence of specific to business cycles.

The series covered in the next eight figures derive their claims as 'indicators of business conditions' from the importance of the single processes which they represent, not from a combination of measures of several basic processes, as is the case with the A. T. & T. index. Thus Figure 2 presents the cyclical behavior of deflated bank clearings outside of New York City prior to 1919 and of bank debits outside of New York City after that date. The most striking difference between this series and the A. T. & T. index is the upward tilt of its cyclical patterns. As may be expected of a process with a rapidly rising secular trend, deflated clearings tend to lead fairly consistently at reference revivals and to lag at reference recessions, so that the contraction phase of the specific cycles is exceptionally brief. The high level of the conformity indexes and the similarity of the reference-cycle and specific-cycle patterns indicate that the series has conformed well to the cyclical fluctuations in general business. But the specific cycles have not borne throughout a one-to-one correspondence to business cycles. Even the business-cycle index falls short of +100, for the reason that the series rose more rapidly during the contraction phase than during the expansion phase of the business cycle of 1924-27.

Figures 3 and 4 picture the cyclical behavior in recent years of factory employment and payrolls in the United States. The fluctuations of both series conform very closely to business cycles. The amplitude of the cycles in payrolls is larger than in employment; in each of the three comparable cycles the former is half again as large as the latter. The explanation is that business enterprises adjust themselves to the changing markets for their wares by varying cyclically the amount of work offered to individual employees and the rate of pay as well as the number of workers carried on the payrolls. Restricting comparisons to 1921-33, we find that the amplitude of the A. T. & T. index is about the same as that of factory payrolls. The vertical lines representing average deviations indicate by their conspicuous lengths that the three cycles covered by payrolls have widely dissimilar patterns. The downward tilts of the patterns of both payrolls and employment are due mainly to the severity of the latest depression.

After excluding the cycles affected by grave monetary disturbances, we contrast in Figures 5 and 6 the cyclical behavior of wholesale prices in the United States and the United Kingdom. For the United Kingdom we use the Sauerbeck index of wholesale prices; for the United States we use the Bureau of Labor Statistics index for the period since 1890 and the index recently constructed by Professors Warren and Pearson for the earlier years. According to these indexes, the average amplitude of cyclical fluctuations in wholesale prices has been about the same in the two countries. But the charts show plainly that both specific and business cycles are longer in the United Kingdom; and when allowance is made for the difference in duration, it becomes clear that American commodity prices have fluctuated more widely than British prices. However, a glance at the other charts in this *Bulletin* will show that, in the absence of sharply abnormal monetary changes, the general level of commodity prices at wholesale is a relatively stable factor. Both here and in Great Britain commodity prices have conformed fairly well to the cycles in general business, although in each country the wholesale price index has occasionally risen during the downward swing of a business cycle and declined or failed to rise during the upward swing.

Figures 7 to 9 enable us to contrast the cyclical behavior of American exports with both British exports and American imports. As in the case of the wholesale price indexes, the cycles most affected by monetary disturbances are excluded from the averages. The charts show that the absolute amplitude of American exports has been about the same as that of British exports but that the cyclical rise and fall per month of American exports has been notably larger. They show also that, while there have been fewer cycles in American imports than in American exports, the former have on the average attained larger amplitudes. But the outstanding differences among the several series consist in their behavior in regard to business cycles. While the exports of the United Kingdom have conformed closely to British business cycles and the imports of the United States to American business cycles, the exports of the United States show only faint traces of conformity to American business cycles. The cyclical variations in American imports have reflected the power of this country to purchase foreign goods and have therefore conformed with considerable regularity to the cyclical alternations in general business. On the other hand exports have been governed mainly by business conditions in America's foreign markets, which in considerable measure have been independent of business conditions in this country. In Great Britain exports form a much larger proportion of domestic produc-

CHART 2

CYCLICAL PATTERNS OF INDICATORS OF GENERAL BUSINESS

FIGURE 1

A.T.&T. INDEX OF INDUSTRIAL ACTIVITY
UNITED STATES: BY MONTHS

--- 15 SPECIFIC CYCLES, 1879-1933
—— 15 REFERENCE CYCLES, 1879-1933
CONFORMITY: +100, +100, +100

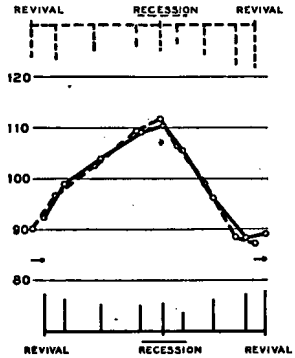


FIGURE 2

DEFLATED BANK CLEARINGS AND DEBITS
OUTSIDE OF NEW YORK CITY: BY MONTHS

--- 15 SPECIFIC CYCLES, 1878-1933
—— 15 REFERENCE CYCLES, 1879-1933
CONFORMITY: +100, +73, +86

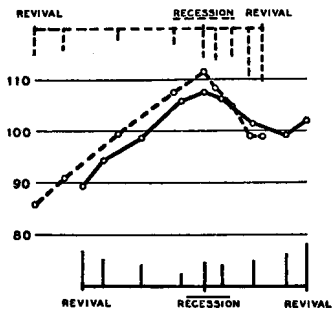


FIGURE 3

INDEX OF FACTORY EMPLOYMENT
UNITED STATES: BY MONTHS

--- 5 SPECIFIC CYCLES, 1915-33
—— 5 REFERENCE CYCLES, 1915-33
CONFORMITY: +100, +100, +100

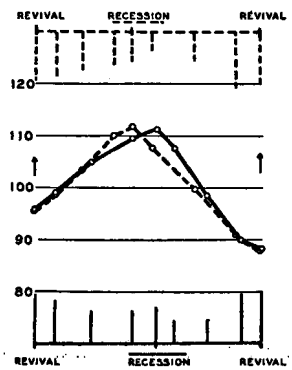


FIGURE 4

INDEX OF FACTORY PAYROLLS
UNITED STATES: BY MONTHS

--- 3 SPECIFIC CYCLES, 1921-33
—— 3 REFERENCE CYCLES, 1921-33
CONFORMITY: +100, +100, +100

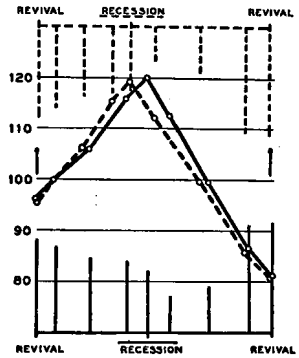


FIGURE 5

INDEX OF WHOLESALE PRICES
UNITED STATES: BY MONTHS

--- 15 SPECIFIC CYCLES, 1856-61, 1871-1914, 1922-33
—— 16 REFERENCE CYCLES, 1855-61, 1871-1914, 1921-33
CONFORMITY: +50, +81, +90

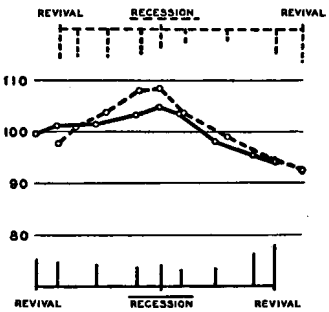


FIGURE 6

INDEX OF WHOLESALE PRICES
UNITED KINGDOM: BY MONTHS

--- 4 SPECIFIC CYCLES, 1888-1914
—— 5 REFERENCE CYCLES, 1888-1914
CONFORMITY: +80, +60, +78

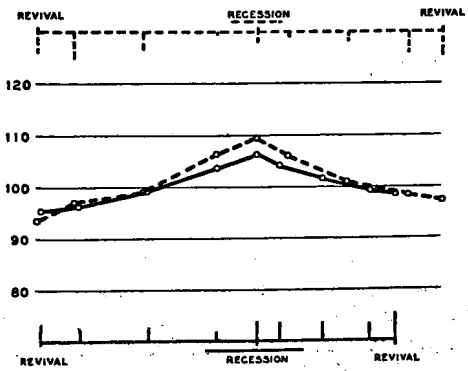


FIGURE 7

TOTAL EXPORTS
UNITED KINGDOM: BY MONTHS

--- 12 SPECIFIC CYCLES, 1855-1914, 1927-32
—— 12 REFERENCE CYCLES, 1855-1914, 1926-32
CONFORMITY: +100, +83, +95

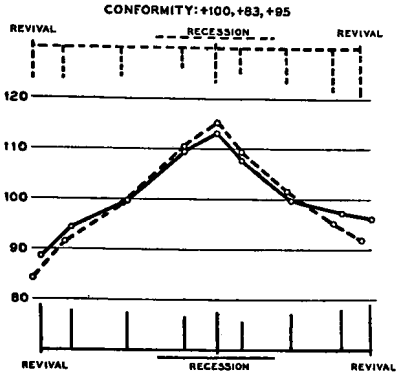


FIGURE 8

TOTAL EXPORTS
UNITED STATES: BY MONTHS

--- 19 SPECIFIC CYCLES, 1868-1914, 1921-33
—— 15 REFERENCE CYCLES, 1868-1914, 1921-33
CONFORMITY: +33, −20, +18

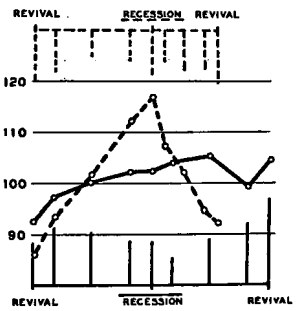


FIGURE 9

TOTAL IMPORTS
UNITED STATES: BY MONTHS

--- 16 SPECIFIC CYCLES, 1868-1915, 1921-33
—— 15 REFERENCE CYCLES, 1868-1914, 1921-33
CONFORMITY: +93, +40, +93

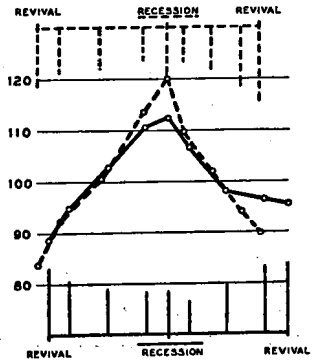
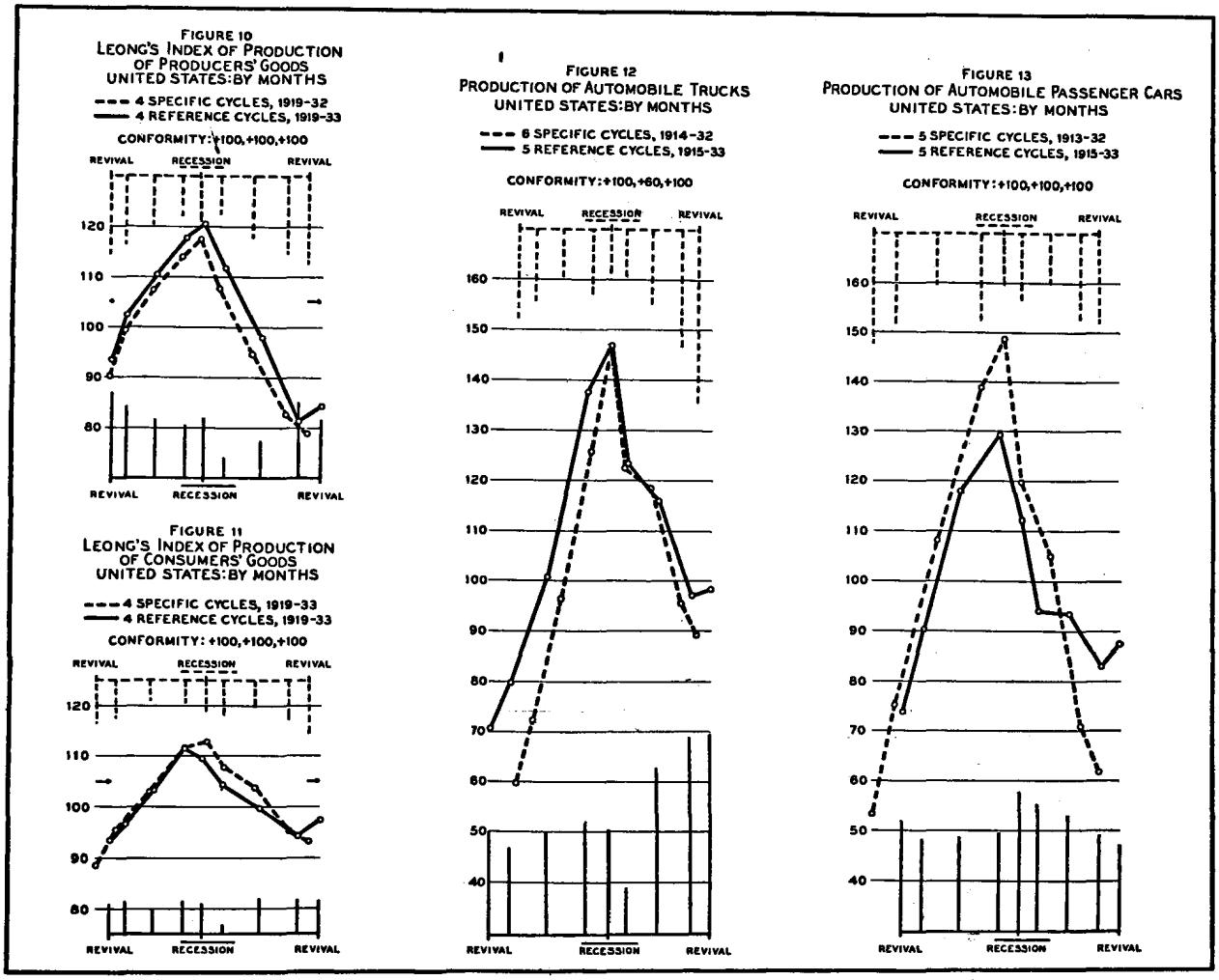


CHART 3
CYCLICAL PATTERNS OF PRODUCTION OF PRODUCERS' AND CONSUMERS' GOODS



tion than in the United States; they are also dominated by finished manufactures rather than by raw materials or semi-manufactures; hence the state of British exports, unlike that of American exports, is a sensitive barometer of domestic business conditions.

3. Producers' Goods and Consumers' Goods

Writers on business cycles make much of the differences in cyclical behavior between producers' and consumers' goods. A few of the characteristics of the production of these two classes of goods are illustrated in Chart 3. In Figures 10 and 11 we compare the cyclical patterns of the output of producers' and consumers' goods, made from the index numbers constructed by Dr. Y. S. Leong. Both indexes conform closely to business cycles, but the former shows slightly more symmetrical cyclical patterns. The two indexes confirm expectations in showing that the cycles in the output of producers' goods have larger amplitudes than the cycles in the output of consumers' goods. However, this valuable generalization must not be used indiscriminately. Figures 12 and 13 indicate that the average amplitude of the production of passenger cars, a consumers' good, is larger than that of trucks, a producers' good; and this difference between the averages is on the whole borne out by the arrays of individual cycles. Nor can the close conformity of the index of production of consumers' goods be accepted as representative of the output of the generality of consumers' goods. The production of durable consumers' goods such as passenger cars (Figure 13) and of ephemeral pleasant goods such as ice cream (Figure 14) conforms rather closely to business cycles, but the production of staples such as meats (Figure 15) or refined sugar (Figure 16) bears a rather irregular relationship to business cycles.

CHART 3 (CONT.)
CYCLICAL PATTERNS OF PRODUCTION OF PRODUCERS' AND CONSUMERS' GOODS

FIGURE 14
PRODUCTION OF ICE CREAM
UNITED STATES: BY MONTHS

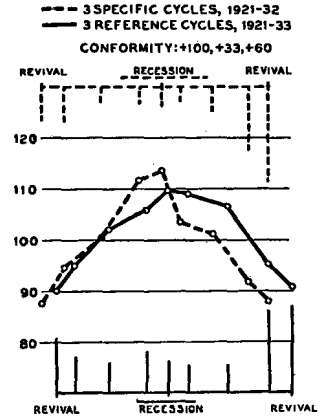


FIGURE 15
INDEX OF ANIMALS SLAUGHTERED
UNITED STATES: BY MONTHS

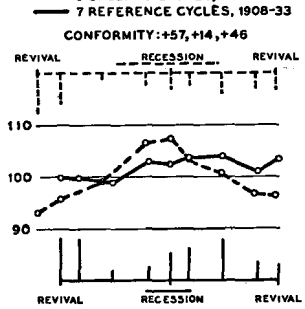


FIGURE 16
SUGAR MELTINGS
UNITED STATES: BY MONTHS

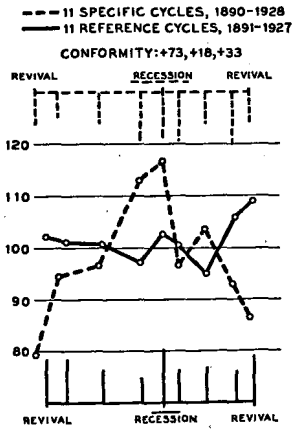


FIGURE 17
ORDERS OF RAILROAD LOCOMOTIVES
UNITED STATES: BY QUARTERS

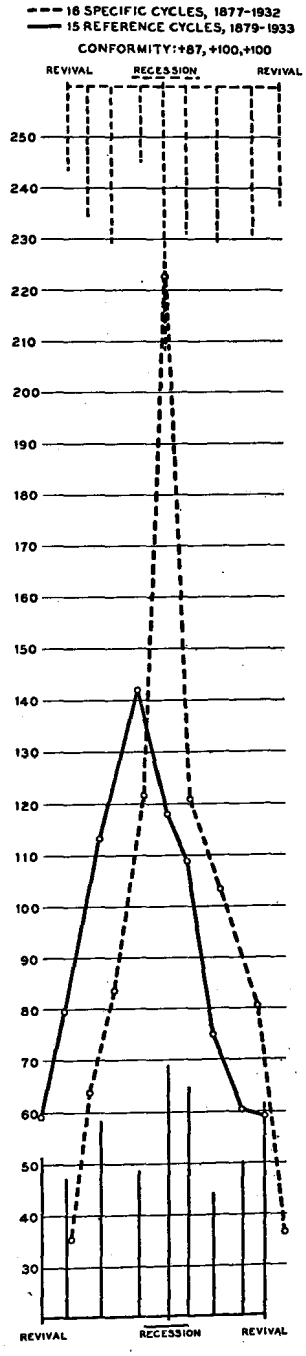
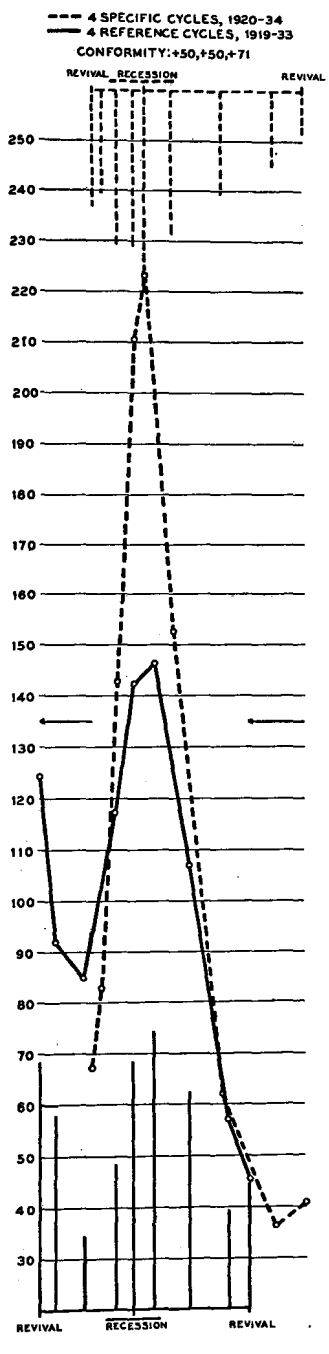


FIGURE 18
SHIPMENTS OF RAILROAD LOCOMOTIVES
UNITED STATES: BY MONTHS



The fluctuations in the output of producers' goods find their most violent expression in the railway equipment industry. Here a business depression always means a sharp curtailment of output, and at times a complete cessation of output. Figures 17 and 18 show the cyclical behavior at two stages in the production of locomotives; the first chart represents the initial stage—the placing of orders, and the second represents the terminal stage—the shipment of completed locomotives. The enormous range of the fluctuations overshadows every other feature of the patterns. But the charts show also that orders respond more quickly to cyclical changes in general business than do shipments, that orders are slightly more volatile than shipments, and that orders conform somewhat more closely to business cycles than do shipments. These differences persist when the cyclical patterns of orders are made to cover the same brief interval as shipments. The brief specific-cycle expansion and the downward tilt of the patterns of locomotive shipments attest the declining trend in the number of locomotives produced.

4. Coal, Electricity, Coke and Iron

In Chart 4 we show the cyclical patterns of a closely related group of basic industrial processes in the United States—the production of power and iron. Anthracite coal (Figure 19) has become more and more a consumers' good with the passage of time. Vastly more important as a business factor is the production of bituminous coal (Figure 20). Though burned by millions of families, it is primarily a producers' good—perhaps the producers' good which has the most widely distributed demand. Largely for this reason the amplitude of bituminous coal production is smaller than is usual among raw producers' goods in the United States; but it is about the same as the amplitude of Leong's index of the output of producers' goods and larger than the amplitude of anthracite coal shipments. If the cycles in the anthracite coal industry seriously affected by strikes are included in the averages, the amplitudes of anthracite shipments and bituminous production become virtually identical. Even when the cycles affected by strikes are excluded, random factors continue to mar the specific-cycle pattern of anthracite coal, as Figure 19 shows. But the specific-cycle pattern of bituminous coal is severely continuous, as is also the reference-cycle pattern. The conformity of the anthracite coal industry to business cycles is moderate at best, while the conformity of the bituminous coal industry is remarkably high.

Electricity is the latest type of energy to be utilized on an extensive scale by industry and households. The greater portion of electric power is produced from coal and enters into industrial uses. Our statistical records catch the electric power industry in the stage of rapid growth, as the sharp upward tilt of the patterns of Figure 21 indicates. As befits a youthful industry, the contractions of specific cycles are brief and mild, with production tending to lag at recessions in general business and to lead at revivals. Our series of electric power production shows positive conformity to each business cycle, but it does so at times through a retardation of growth during reference contractions rather than through actual declines.

More than any other industry the production of iron and steel has long enjoyed the distinction of being regarded as an excellent barometer of trade; so diversified are the uses of iron and steel, particularly for industrial equipment and construction work. The cyclical behavior of pig iron production in the United States is pictured in Figure 22, and of coke—a good complementary to pig iron—in Figure 23. The cyclical patterns of the two series are much alike when compared for the full periods of their statistical histories and are nearly replicas of one another when compared for identical periods. Iron production conforms with exemplary regularity to business cycles, as does coke production. The cyclical patterns of coke production may be compared profitably with the patterns of bituminous coal production; partly because coke is a fuel of more restricted industrial use and partly because it constitutes one of the main outlets for the bituminous coal trade.

A striking shift in the cyclical behavior of the coke industry, consequent upon a change in industrial technique, is illustrated in Figures 24 and 25. In this country coke was long made in 'beehive' ovens from which the by-products ran to waste. But by the end of the World War, the output from the more efficient 'by-product' ovens exceeded that from the older ovens. Hence we break the record of the production of beehive coke in 1919, and show separately the cyclical patterns during the period of secular growth when beehive coke was the main portion of the coke output and during the period of secular decline when beehive ovens were relied upon mainly to supplement the chief supply. The cyclical patterns of beehive coke output prior to 1919 resemble closely the patterns of total coke output, even though the two series have only one cycle in common. But comparing the cyclical behavior of beehive coke production before and after 1919, we find that the average amplitude of the cycles in the later period is more than twice that in the former, that expansions have become shorter and contractions longer, and that a tendency to lead at revivals and lag at recessions has given way to a tendency to lag at revivals and lead at recessions. The average lead at reference recessions shown by Figure 24 is a distortion produced by a lead of 32 months at the reference recession of the War cycle.

5. Crop Production

The last of the production series that we present are shown in Chart 5. These relate to production on farms, whereas the preceding charts picture the cyclical behavior of production in factories and mines. The specific-cycle patterns in

CHART 4

CYCLICAL PATTERNS OF PRODUCTION OF COAL, ELECTRICITY, COKE AND IRON

FIGURE 19
SHIPMENTS OF ANTHRACITE COAL
UNITED STATES: BY MONTHS

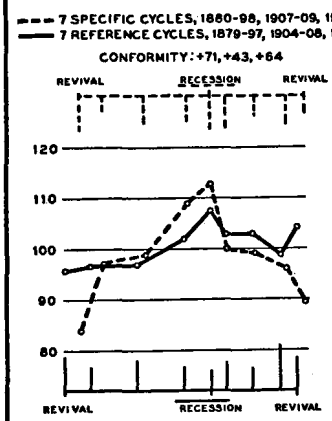


FIGURE 20
PRODUCTION OF BITUMINOUS COAL
UNITED STATES: BY MONTHS

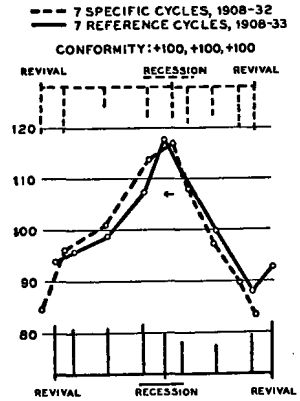


FIGURE 21
PRODUCTION OF ELECTRIC POWER
UNITED STATES: BY MONTHS

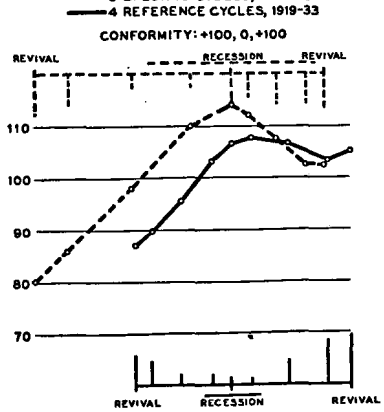


FIGURE 22
PRODUCTION OF PIG IRON
UNITED STATES: BY MONTHS

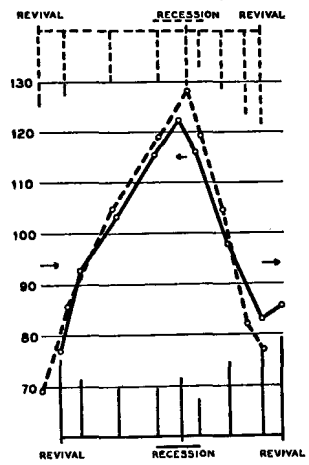


FIGURE 23
PRODUCTION OF COKE, TOTAL
UNITED STATES: BY MONTHS

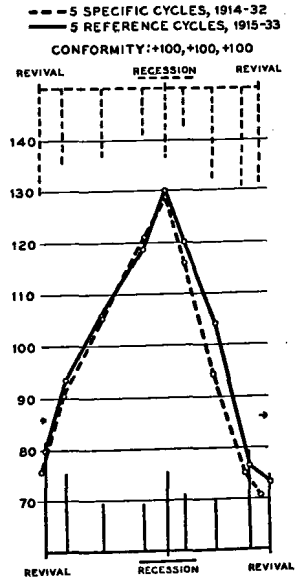


FIGURE 24
PRODUCTION OF BEEHIVE COKE
UNITED STATES: BY MONTHS

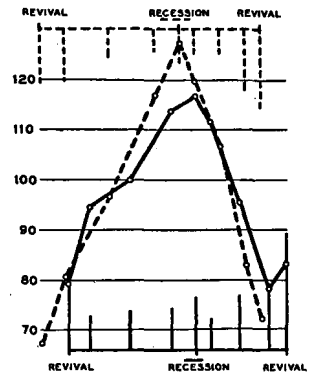


FIGURE 25
PRODUCTION OF BEEHIVE COKE
UNITED STATES: BY MONTHS

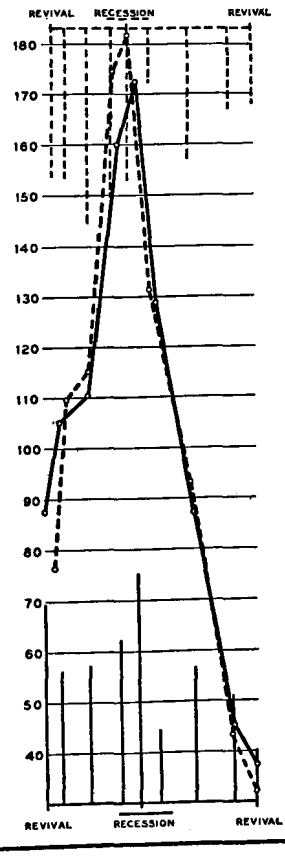
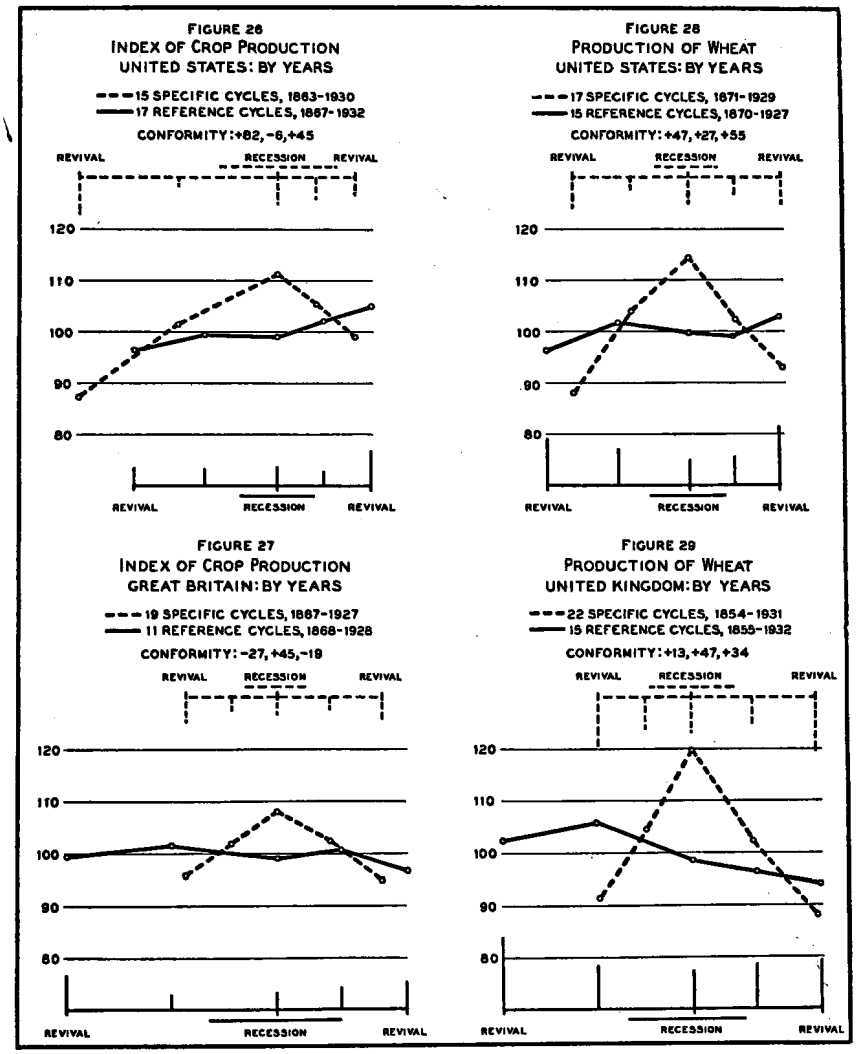


CHART 5
CYCLICAL PATTERNS OF CROP PRODUCTION

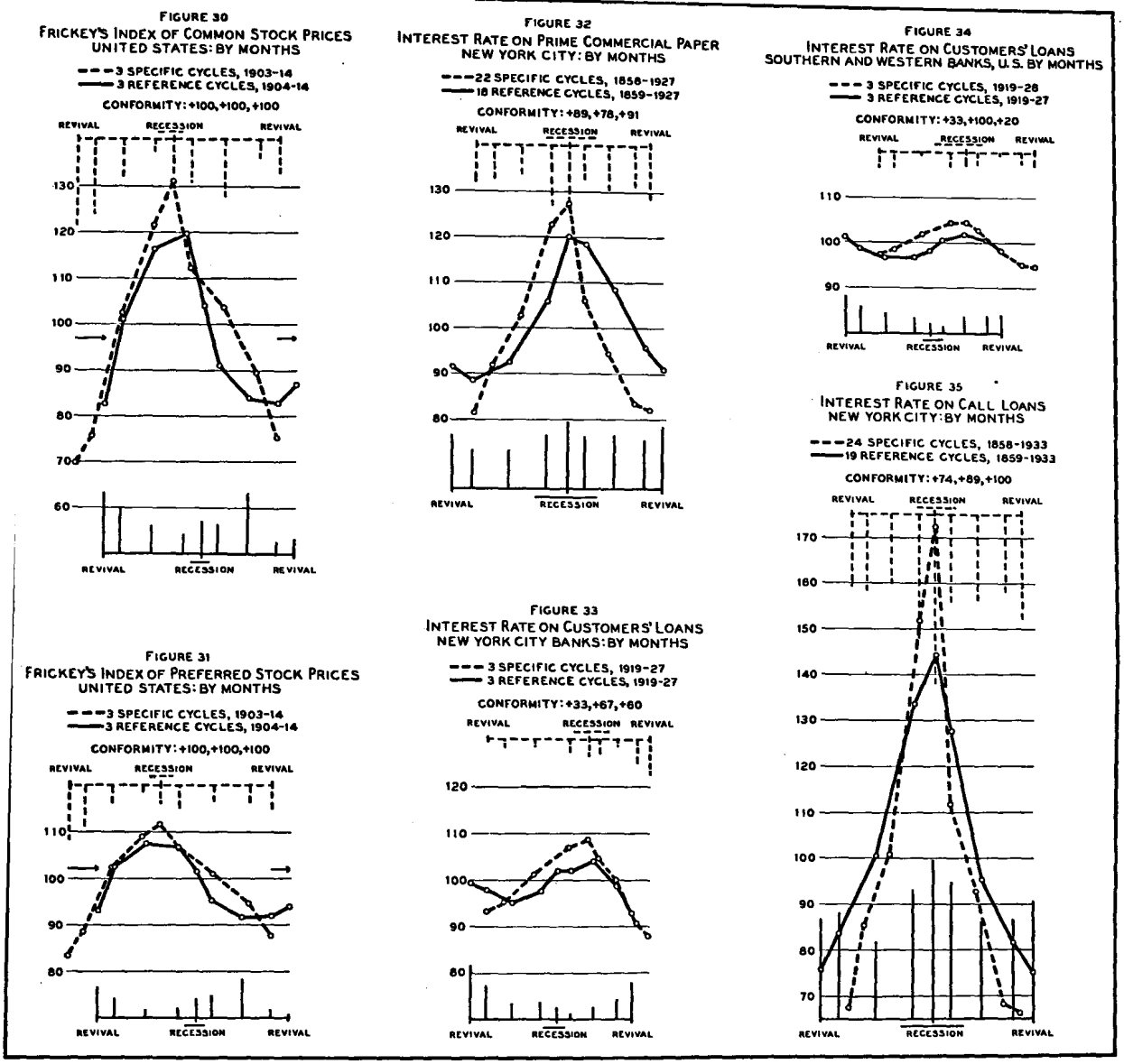


each of the crop charts are as clear-cut as in any of the industrial charts. They are rather mild in amplitude; but they are based on annual harvests and allowance must be made for the fact that annual data yield smaller amplitudes than monthly data. What distinguishes the crop charts from all preceding charts—except, perhaps, American exports and animal slaughter—is the flatness of their reference-cycle patterns. The behavior of crop production during the period of one business cycle has so little relation to the behavior during another, that when the reference-cycle relatives for a number of business cycles are averaged they reveal mainly the secular trends—rising in the United States and declining in Great Britain. The lack of any semblance of relationship to the timing of business cycles is reflected also in the durations of the cycles in total crop production, which are on the average shorter in Great Britain than in this country though British business cycles are on the average considerably longer than business cycles in the United States. The lack of relationship in time between crop production and business cycles does not mean that harvests have no effect upon business cycles; but it does mean that this influence is a random factor.

6. Stock Prices and Interest Rates

A few series illustrating the cyclical behavior of the security and money markets are assembled in Chart 6. In Figures 30 and 31 we contrast the cyclical patterns of indexes of prices of common and preferred stocks traded on the New York Stock Exchange during three pre-War cycles. These indexes were constructed by Professor Edwin Frickey from quotations for identical lists of 20 manu-

CHART 6
CYCLICAL PATTERNS OF STOCK PRICES AND INTEREST RATES



facturing corporations. The two indexes consistently show leads at reference revivals and recessions, but the leads of preferred stock prices tend to be slightly longer. Both indexes conform closely in their fluctuations to the general waves in business activity. The amplitude of the cycles in preferred stock prices is less than half the amplitude of common stock prices, but it is larger than that of the A. T. & T. index and well over twice that of the Bureau of Labor Statistics index of wholesale prices during comparable periods. The amplitude of the index of common stock prices exceeds the amplitude even of pig iron production. But it must be noted that Frickey's indexes are designed to serve primarily as measures of speculative activity and that they are heavily weighted with iron and steel shares; also, that the index of common stock prices shows somewhat larger fluctuations than do the Dow-Jones averages during the same period.

Various writers assign to the fluctuations of interest rates—more often, of *the* interest rate—a key position in their explanations of how business cycles come about. Chart 6 includes only four samples from our collection of

series on interest rates, but it suffices to suggest that the cyclical behavior of each kind of interest rate has marked peculiarities which the theorist cannot afford to overlook. The call loan rate is subject to large random fluctuations and to cyclical fluctuations that are rivalled in amplitude only by the most volatile series on the production of industrial equipment. The cycles in the commercial paper rate have less than half the amplitude of the call loan rate, but they have almost four times the amplitude of the wholesale price indexes charted above. However, the rate on customers' loans charged by New York City banks shows cycles of smaller amplitude than that shown by the A. T. & T. index for a comparable period; and the customers' rate in 27 Southern and Western cities exhibits cycles that are even milder than those found in wholesale prices. The differences in timing are almost as marked as the differences in amplitude. The call loan rate leads about as often as it lags at reference revivals and recessions. But the commercial paper rate evidences a tendency to lag at the turns of general business, and so do the two series on customers' rates. The conformity indexes run highest in call money rates and lowest in the customers' rate of Southern and Western banks. Neither of the two long series—the commercial paper rate and the call loan rate—shows a strict one-to-one correspondence of specific to business cycles; but the excess of specific cycles over reference cycles results almost entirely from the intercalation of financial cycles between the reference dates of business cycles.

SOURCES OF DATA

The following notes identify briefly the sources from which the original data of the series discussed in this *Bulletin* are drawn.

Fig. 1. For 1900-33, American Telephone and Telegraph Co., *Index of Industrial Activity in the United States* (Report, Oct. 20, 1932), and monthly issues of *Summary of Business Conditions.* For earlier years, *Harvard Business Review,* January 1923, p. 159.

Fig. 2. Data on bank clearings outside of New York through 1918, compiled by Dr. F. R. Macaulay of the National Bureau of Economic Research. Figures of bank debits outside of New York beginning with 1919, from the *Federal Reserve Bulletin.* Both series deflated by Carl Snyder's index of the general price level.

Fig. 3. For 1914-18, *Monthly Labor Review,* December 1925, p. 121. For 1919-33, *Federal Reserve Bulletin,* June 1934, p. 326.

Fig. 4. Bureau of Labor Statistics, Bulletin No. 610, p. 22.

Fig. 5. Beginning with 1890, bulletins of Bureau of Labor Statistics. For earlier years, G. F. Warren and F. A. Pearson, *Prices* (John Wiley, 1933), pp. 12-13.

Fig. 6. The Statist, Jubilee Section, June 1928, p. 134.

Fig. 7. Great Britain, *Accounts Relating to Trade and Navigation.*

Figs. 8 and 9. Through June 1914, *Monthly Summary of Commerce and Finance,* particularly the issue of December 1910, pp. 1120-6. Since July 1914, *Monthly Summary of Foreign Commerce.*

Figs. 10 and 11. Journal of the American Statistical Association, June 1935, p. 371.

Figs. 12 and 13. Through June 1921, *Survey of Current Business.* Since July 1921, Bureau of the Census, *Automobiles.*

Fig. 14. Through 1926, Department of Agriculture, Statistical Bulletin No. 25. Since 1927, *Yearbook of Agriculture* and *Crops and Markets.*

Fig. 15. Index constructed by National Bureau of Economic Research from data on federally inspected slaughter of cattle, calves, hogs, sheep and lambs; the weights being in proportion to the average value, as shown in the Census of Manufactures from 1909 through 1929, of each class of animals slaughtered.

Fig. 16. Weekly Statistical Sugar Trade Journal. Data relate to four Atlantic ports.

Fig. 17. For 1877-1924, J. E. Partington, *Railroad Purchasing and the Business Cycle* (Brookings Institution, 1929). Since 1924, *Survey of Current Business.*

Fig. 18. For 1918-19, *Federal Reserve Bulletin.* For 1920-34, Bureau of the Census, *Railroad Locomotives.*

Fig. 19. The Coal Trade (F. E. Saward, editor).

Fig. 20. Mineral Resources and *Minerals Yearbook.*

Fig. 21. For 1919, University of Illinois, Bureau of Business Research, Bulletin No. 16, p. 37. For 1920-33, *Survey of Current Business.*

Fig. 22. From 1902 on, *Iron Age.* For earlier years, unpublished figures estimated by Dr. F. R. Macaulay of the National Bureau of Economic Research.

Figs. 23, 24 and 25. Same as Fig. 20.

Fig. 26. Through 1924, W. M. Persons, *Forecasting Business Cycles* (John Wiley, 1931), pp. 170-1. Since 1924, Warren and Pearson, *op. cit.,* p. 45.

Fig. 27. Weltwirtschaftliches Archiv, March 1935, pp. 293-4.

Fig. 28. For 1866-1910, Food Research Institute, *Wheat Studies,* Vol. II, pp. 260-1. From 1911 on, latest revisions of Department of Agriculture.

Fig. 29. Through 1884, *Journal of the Royal Agricultural Society of England,* Third Series, Vol. IV, p. 132. From 1885 on, Food Research Institute, *Wheat Studies,* Vol. IX, p. 268 and Vol. X, p. 278.

Figs. 30 and 31. Review of Economic Statistics, August 1921, pp. 275-6.

Fig. 32. Unpublished series compiled by Dr. F. R. Macaulay of the National Bureau of Economic Research.

Figs. 33 and 34. Annual Report of the Federal Reserve Board, 1931, p. 82.

Fig. 35. Same as Fig. 32.

National Bureau
of Economic Research

BULLETIN 60

JUNE 30, 1936

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Measures of Capital Consumption, 1919-1933

Copyright 1936, National Bureau of Economic Research, Inc.

SOLOMON FABRICANT

THE ACCOUNTING CONCEPT OF CAPITAL CONSUMPTION

We may most conveniently clarify our notions of the meaning of capital consumption by considering what is implied by the term in business practice. Capital consumption, as the business man sees it, is chiefly represented by deductions from asset accounts (or additions to corresponding valuation accounts), and to a lesser extent by certain direct charges to operations. The relevant entries used in recording the consumption of fixed capital (to which we confine ourselves in this *Bulletin*) include those arising from the following:

1. Depreciation
2. Depletion
3. Retirement and abandonment
4. Destruction by accident
5. Loss on sale
6. Write-down
7. Repairs, renewals and maintenance
8. Capital expenditures charged directly to current operations

To obtain a national total of capital consumption mere transfers among enterprises are eliminated, as in a consolidated statement, except to the extent that they give rise to changes in book values.

Depreciation and depletion charges are estimates, admittedly and of necessity crude, made by the business man on the basis of whatever experience is available. The rate of depreciation or depletion is not the only element approximated. Even the book value to which it is applied, although more definite only if it represents original cost, is itself merely an approximation to the current value of the capital goods being depreciated or depleted. The nature of this approximation, and the bias inherent in it, will concern us later.

Entries arising out of retirements and abandonments may represent losses through depreciation, depletion and obsolescence for which inadequate allowance had been made; or they may constitute the method of currently recording capital consumption. In either case, they represent primarily a *post facto* determination of loss. This is not to imply that this determination is entirely devoid of foresight. The abandonment of workable equipment always manifests a judgment as to the future.

The value of property accidently destroyed is not equal to the deduction made for the destruction if there is any insurance reserve on the books of either the enterprise concerned or its insurance company. We may look upon such destruction as equivalent to the retirement of fully depreciated equipment, in which case part of the insurance premiums (or other charges) has already covered the loss incurred. Or we may record such destruction only when it actually occurs. The former method is the common way of handling these deductions. The latter, however, is more convenient statistically. Since insurance reserves are set up, or their absence justified for large concerns, because such destruction is fairly regular in time and therefore predictable within reasonable degrees of error, the two amounts tend to coincide. The difference between book value of destroyed property and the sum of salvage value and insurance payments chiefly indicates a change in price levels. (More is said of these price changes below.) Types of destruction not commonly taken into business calculations may only be mentioned in this *Bulletin*.

Write-downs of the values of capital goods as well as losses on their sale may, like losses on retirement or abandonment of equipment, indicate inadequate estimates of previous capital consumption. But these entries may also, perhaps more often, represent changes in prices (or even in interest rates). If use is made of original cost—or, indeed, of any estimate not as of the most recent date—price changes will become apparent upon the disposal of plant or equipment. To the extent that write-downs result in lower depreciation charges (and that is one reason given in their justification), it is necessary to include them if we are interested in measuring capital consumption in terms of dollars of original investment and if we are not to suffer an omission from our aggregates. Similar reasoning holds for

write-ups, which increase depreciation charges. However, since the income tax laws do not permit this kind of change to affect depreciation and depletion charges, and since we use depreciation data derived from tax returns, we have omitted from consideration, in this *Bulletin,* charges arising from write-downs.[1]

In all businesses there are minor elements, and in some industries major elements, of capital loss that are not passed through the asset accounts but are recorded when replacements are made. The entry resulting is a charge to repairs, renewals, and maintenance. The expenditures incurred in these restorations of capital are in many ways current prime costs and do not represent the consumption of capital in any ordinary sense. This is obvious when these expenditures fluctuate with output, or more definitely, with the use of capital goods (allowance being made for seasonal movements). But to the extent that they do not do so, by the amount of consequent over- or under-maintenance, we have the formation or consumption of capital. As we shall see, the total magnitude of these expenditures is quite large. A relatively small deviation from 'normal' maintenance may mean a large absolute change in capital. These expenditures, therefore, merit attention even though they fall outside the category of credits to asset accounts. 'Extraordinary' repairs and renewals that are charged to reserves for depreciation presumably represent capital formation.

As a rule capital expenditures, except occasionally those involved in acquiring intangible assets, are not charged immediately to current operations. Other exceptions occur in secret reserves and development costs in the mining industries. The latter, while including intangibles (they are, in fact, usually called by that term), also involve expenditures upon material things. We shall therefore include them, to complete our list. These also do not take the form of credits to asset accounts, except on the supposition of a simultaneous setting up and writing off of a capital asset.

The entries in the above categories are restricted to those relating to fixed capital: in this *Bulletin* we limit our attention to the type of business capital resident in fixed assets, other than land. These assets include plant, equipment, furniture and fixtures, improvements of real estate, and exhaustible resources. Land, business inventories, intangible assets, and durable goods in the possession of non-business entities—consumers and public and semi-public bodies—are not considered here, with one exception. Estimates of the consumption of capital invested in residences are presented in an appendix. Owing to lack of data it is impossible to show separately the depreciation of residential structures held by business concerns. It is combined with the depreciation of other rented residences (Appendix Table III).

In the next section we attempt to determine the quantitative importance of the items in the various categories listed above and to indicate their fluctuations during the last fifteen years. It must be remembered that full data with which to fill out our outline quantitatively are unavailable. In more instances than we would wish the information is incomplete. This follows from the very nature of the underlying phenomena, which are subtle, gradual, not susceptible of easy record, and entwined with the hopes and fears of business venture.

ACCOUNTING ESTIMATES OF CAPITAL CONSUMPTION

Available figures on the most important elements of capital consumption, supplemented by estimates of varying degree of reliability, appear in Table 1. These accounting estimates are 'institutional' estimates in the sense that they were made in accordance with current modes and habits of estimation.

The deficiencies of our data are numerous. Losses due to retirement and abandonment are given for only one industry—steam railroads. (These appear in greater detail in Appendix Table I.) Destruction by accident is estimated only for fire losses; however, these probably constitute the major part of such deductions. Losses on sale of capital assets and write-downs are not given at all. Repairs and renewals are given only for public utilities, together with major repairs and alterations of buildings. Development expenditures in mining industries constitute the only data available on capital expenditures charged directly to current operations.

One reason for the absence of data is the minor importance of some items. This appears to be the reason in the case of losses on the sale of capital assets. When reported in corporate financial statements, the amounts given are usually small. No reliable estimate may be made on the basis of figures published by the Treasury Department in *Statistics of Income.* The losses compiled by the Treasury Department are given only in combination with losses on the sale of investments (stocks and bonds). While the total of these two types of loss has been large in each of the years 1931-33, it is probable that losses incurred in disposing of investments have constituted the bulk of the total. This presumption is strengthened by the fact that companies in the financial field have reported over half the losses.

Write-downs, however, although omitted are important. A rough estimate, made in *Bulletin 55* of this series (p. 10), indicated that several billion dollars of capital assets were written off by industrial corporations alone in the

[1] In the National Bureau study of capital consumption of which this is an interim report, it is hoped to consider the amount of these revaluations in some detail; examination of reports made to the Securities and Exchange Commission indicates their wide prevalence.

TABLE 1

ACCOUNTING MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933, BY TYPE[1]

(in millions of dollars)

YEAR	DEPRECIATION	DEPLETION	DEPRECIATION AND DEPLETION	REPAIRS, RENEWALS AND MAINTENANCE	DEVELOPMENT EXPENSE (MINING)	FIRE LOSSES	TOTAL
1919			3,797	2,589	334	126	6,846
1920			4,154	3,305	495	176	8,130
1921			4,128	2,706	286	195	7,315
1922			4,435	2,682	312	200	7,629
1923			4,713	3,061	392	211	8,377
1924			4,825	2,762	338	216	8,141
1925	4,561	524	5,085	2,698	351	220	8,354
1926	5,109	614	5,723	2,841	373	221	9,158
1927	5,166	540	5,706	2,876	322	186	9,090
1928	5,472	555	6,027	2,735	304	183	9,249
1929	5,870	596	6,466	2,906	321	181	9,874
1930	5,940	493	6,433	2,442	260	198	9,333
1931	5,886	291	6,177	1,946	173	178	8,474
1932	5,475	263	5,738	1,365	134	158	7,395
1933	5,258	264	5,522	1,316	139	106	7,083

[1] A more detailed breakdown is given in Appendix Table I. Sources and methods of estimation appear in footnotes of that table. Properly to understand these figures requires careful attention to the methods of estimation as well as to the discussion in the text. Depreciation and depletion charges are not available separately for years prior to 1925 (see Table 5, footnote).

two years 1931 and 1932. But these revaluations need not concern us at least in so far as the general magnitude of the figures in the table is considered over long periods.

The business depreciation charges are based on those reported to the Treasury Department for use in the determination of income taxes. There is reason to believe that the basic depreciation rates are somewhat higher than would be used for determining net income for other than tax purposes. They would thus tend to include at least some allowance for that type of capital loss which ordinarily is expressed in lump sums in the form of write-offs and abandonments. The latter, of course, are not deductions recognized by the income tax laws.

Not only may the depreciation figures *accepted* by the Treasury Department be higher than those that would otherwise be charged; the figures *reported* may even be higher than those *accepted*. That this is not rare is shown by adjustments made in published financial statements increasing surplus for excess depreciation charges not allowed by the Treasury Department.[2]

The degree of overstatement may show a secular decline, especially as company estimates are reduced by governmental audit and accountants become better acquainted with what is acceptable to the tax authorities. To the extent that this occurred, the advance over the period being reviewed is understated.

[2] On the other hand, even the reported charges may appear too low to those who would make large allowances for future obsolescence. Only 'normal' obsolescence is recognized by tax authorities, except at actual retirement or other disposal of equipment.

The rise in business charges for depreciation is irregular from year to year, and is probably affected by slight changes in coverage. The only definite decline in depreciation charges began in 1931. The decline in total depreciation and depletion charges in 1927 and 1930 was due to the sharp cyclical fall in depletion charges. The excess of investments over retirements resulted in a rise in the volume of capital goods from 1926 to 1927, and from 1929 to 1930. Depreciation charges also rose, as a consequence both of this increase in the amount of depreciable assets and of the prevailing use of some form of the straight-line depreciation formula. In 1931, however, a decline set in and continued for the remainder of the period covered in our table. This decline in 1931-33 tentatively suggests an excess of business capital consumption over gross capital formation.

The rise in depreciation charges over the decade of the 'twenties was the result chiefly of an increase in capital goods and of the persistance of high price levels relative to pre-War costs. As will be shown in more detail below, even if the number and efficiency of buildings, machines and other equipment had remained constant, the price factor alone would have caused a secular rise in depreciation charges.

Depletion charges are essentially rough estimates under any conditions. The figures here presented acquire peculiar characteristics, further, from the tax law provisions regulating their computation. Depletion charges may be based on cost, on discovery value, or on gross value of mineral output, depending on the type of exhaustible resource, on

the year for which they are computed, and on the election of certain alternatives offered to the taxpayer. Further, they may sometimes be limited in amount to a figure equal to or even less than the computed net income before depletion.[3] In prosperous years depletion charges computed on the basis of discovery value or gross income may exceed the amounts necessary to recover capital depletion. In years of depression, when net income before depletion is low, they may fall short of these amounts. The cyclical movements of estimates of actual depletion (and profits) will thus tend to be exaggerated. For these reasons the depletion charges shown here must be accepted with caution. The tax laws have acted, however, not only to distort the entrepreneurial estimates. Were it not for the legal requirement for such estimates, it is doubtful that any deductions would be made in many instances. The situation prevailing before the War is revealing. Although these particular estimates are rough and distorted in many respects, they constitute at least a first approximation to the depletion our natural resources have suffered.[4]

The volume of repairs, renewals and maintenance is shown to be rather large, relative to depreciation charges. This is primarily a consequence of the accounting methods prevailing among the public utilities. In this industry we find maintenance of capital taking the form chiefly of repairs and replacements. Among railroads, for example, practically no depreciation is charged on ways and structures, on the theory that they are fully maintained by current repairs and replacements. To the extent that plant and equipment are in fact not fully maintained we have under-maintenance. This may of course be followed by over-maintenance when delayed repairs are finally made.

Repairs and renewals in industries other than public utilities and real estate also reach a large total. If we may judge from the reports made to the Securities and Exchange Commission by eighty-three large industrial corporations, charges for repairs and renewals ran on the average about equal to depreciation charges in 1934.[5] Much of these charges represents current production costs. However, since their amount is probably great, even a slight deviation from normal maintenance (in the form of deferred repairs, for example) may mean an appreciable volume of capital consumption or formation.

[3] A brief statement of the various provisions and their changes in successive revenue acts is given by R. C. Epstein, *Industrial Profits in the United States* (National Bureau of Economic Research, 1934), p. 328.

[4] Such types of depletion as exhaustion of the soil are not included since no estimates whatever are made by those directly concerned. Rough estimates of soil depletion have been made by the National Resources Board; see the *Report* of December 1, 1934, pp. 15-17.

[5] Data for earlier years are not available except for a few companies, insufficient in number to provide reliable information on annual movements.

The estimates of fire losses of capital equipment are surprisingly small. There are two reasons. First, the rate of fire loss has been decreasing steadily over the last century, and the declining trend is visible even in the last fifteen years. The annual rate of premium charged per hundred dollars of insurance has fallen radically. For one company, the Manufacturers Mutual, the figures (as published in *The Factory Mutuals, 1835-1935*), are as follows:

1845	$ .84	1895	$ .162
1855	.39	1905	.112
1865	.308	1915	.066
1875	.355	1925	.033
1885	.229	1935	.028

Second, during the period covered by the present estimates no conflagration of major proportions occurred. The San Francisco fire of 1906 cost the nation about 350 million dollars: over 25,000 buildings and their contents were destroyed. Obviously, one major disaster like this can wipe out a large fraction of a year's gross increment in capital.

Perhaps more important than such spectacular occurrences, which are rare and of diminishing probability, are the losses arising from soil exhaustion and erosion, which are indirect as well as direct. Since these losses are slow in accumulating, and are not obvious in any case, it is easy to overlook them. Absence of business estimates covering them indicates as much.

A factor affecting the relative values of the several types of capital consumption presented in Table 1 is the average durability of capital goods.[6] If the average life of producers' equipment were shorter, it is improbable that depreciation charges would be affected to the same extent as fire losses.

ACCOUNTING ESTIMATES AND ECONOMIC CONCEPTS

Most broadly defined, the consumption of business capital is measured by the sum of the above entries on the books of business concerns. A somewhat narrower concept omits changes in book valuations arising from the recognition and recording of substantially new price levels, namely, a large portion of write-downs and of losses on sale.

It must be remembered, however, that these measures are aggregates of accounting data, and are based on the accounting concept of capital consumption. Are they satisfactory measures from a social standpoint?

The accountant's conceptions of cost constitute economic forces which affect the conduct of business and the laws of value and production.[6a] Therefore, regardless of the accuracy of the business estimates of capital consumption,

[6] Adequate consideration of this factor raises interesting problems involving rates of interest and prices of capital goods as well as durability. But they cannot be examined here.

[6a] J. M. Clark, *Economics of Overhead Costs* (University of Chicago, 1923), p. x.

business records may not be mere reflections of individual cognizances. Accounts, and the limitations to which they are subject, may in turn influence the sensitivity of business men and the manner of their reaction to the fact of capital decline. But while the accounting concept and the accounting estimates of capital consumption are essential objects of study in the analysis of business behavior, they do not constitute the most adequate concept and estimates of capital consumption from the broad social point of view. In an economic evaluation of national income, savings and wealth, they can be accepted only as first approximations, subject to revision.

Thus, the recognition and recording of capital consumption by business men differ from one industry to another, from one period to another and perhaps also by size of concern. In the estimation of capital consumption from the economic point of view these differences must be taken into account. It is a question whether the particular method of evaluating capital consumption current in each business is not the one to be preferred by the economist even at the expense of consistency. It appears at first sight that the method is current because it *is* the most suitable under the given conditions: who is a better judge of suitability than the entrepreneur, experienced through years of contact with the special conditions of the industry? The economist, however, would be passing by the problem rather than answering it if he were to take this position. It would mean assuming that the given process of evaluation is in fact the most suitable *now*, rather than a habit inherited from the past.

There is also the general bias of business men and accountants in the direction of 'conservatism,' and their understandable penchant for the objectivity of original cost. Further, the reluctance to admit capital consumption is revealed in the not infrequent accumulations necessitating charges to capital. The question whether credits to contingency reserves, or even business savings as such, represent rough forecasts of, and provisions for, future capital losses is not clearly answered in business records. This ambiguity is itself one phase of the difficult problem of allocation in time. Of course an asset account is eventually credited for any losses that occur. But this eventual credit cannot easily be accepted as an adequate record without further consideration. Finally, there is the occasional confusion of tangible and intangible assets. In the valuation (perhaps more frequently, the revaluation) of fixed assets there is sometimes a tendency to ascribe to them monopoly values that are ordinarily imputed to intangibles. From the private viewpoint, of course, the distinction is in some ways academic and, on account of the difficulties involved, is not pressed. But monopoly values are doubtful measures in so far as the economic system at large is concerned.

These are some of the ambiguities and faults inherent in the business concepts of capital consumption. We should not, however, expect to find satisfactory concepts being applied in business practice. Economic theory also has so far failed to provide us with satisfactory concepts of capital and capital consumption, even within the limitations theorists may impose. And for much the same reason. The difficulties involved in constructing rigorous theoretical concepts of capital consumption are identical in nature and source with many of the difficulties troubling accountants and statisticians in their attempts adequately to describe the changing status of business enterprises. Changes in relative prices, technological progress, improvements in quality of goods, the discovery and exhaustion of natural resources—all these dynamic factors continually complicate the situation with which we must deal. They subject even our unit of measurement—money—to changes that restrict its efficiency in aiding us to cope with the evolving environment. In dealing with concrete situations, further, 'non-economic' factors must be taken into account, factors that may be set aside in theoretical considerations. But although theoretical discussions have not yet led to definitive concepts, they have resulted in several valuable guide posts to the direction modification of the business concepts may usefully take.

In the next sections will be considered two striking characteristics of business estimates of capital consumption: the omission of under-maintenance and the use of cost prices.

UNDER-MAINTENANCE

Under-maintenance is almost inevitably a consequence of the desire to avoid making investments that may be postponed and to maintain the apparent rate of profits. For this reason the available figures are few and difficult to interpret. Secret reserves and secret drafts upon capital are, by their very nature, not made public. If maintenance costs are spread over several accounting periods on a budget basis, through reserve accounts, the data are not necessarily secret. But this method of handling such costs, although recommended by accountants where the sums are appreciable, is not widely prevalent or at least is not often revealed by available statements. Indirect evidence is the only means we have of detecting the phenomena of under-maintenance.[7]

[7] If our measures of gross capital formation contain the value of output of repair parts and similar goods, obviously we must include at least that portion of maintenance costs in the measures of capital consumption. Our treatment of both measures must be consistent. Capital formation within the business enterprise, except in public utilities and certain types of construction, and except for the value of parts used in repairs and renewals, has been excluded by Dr. Kuznets from his measures, primarily because of lack of data (see *Bulletin 52*, Gross Capital Formation, 1919-1933). The figures on maintenance presented in this *Bulletin* are still more narrowly limited to public utilities, and to major repairs

TABLE 2

MAINTENANCE RATIOS, CLASS I STEAM RAILWAYS, 1919-1933

YEAR	MAINTENANCE CHARGES OTHER THAN DEPRECIATION, RETIREMENTS, AND INSURANCE, AS A PERCENTAGE OF OPERATING REVENUES	MAN-HOURS OF MAINTENANCE EMPLOYEES PER 100 CAR-MILES [1]
1919	36.20	—
1920	39.77	—
1921	33.20	—
1922	32.21	8.52
1923	32.62	8.74
1924	30.77	8.00
1925	29.90	7.46
1926	29.70	7.16
1927	29.76	6.97
1928	28.50	6.47
1929	28.31	6.39
1930	27.69	5.93
1931	26.49	5.32
1932	23.93	4.95
1933	22.94	4.67

Source: Derived from various data collected by the Interstate Commerce Commission and published in the annual issues of *Statistics of Railways.*

[1] Comparable data are not available for 1919-21.

TABLE 3

MEASURES OF MAINTENANCE, CLASS I STEAM RAILWAYS, 1919-1934

YEAR	REPLACEMENTS: Rails (*thousand tons*)	REPLACEMENTS: Ties (*million*)	PERCENTAGE OF UNSERVICEABLE EQUIPMENT [1]: Freight cars	Locomotives: Passenger	Locomotives: Freight
1919	2,335	80.9	—	—	—
1920	2,507	86.8	7.0	24.8	24.5
1921	2,588	86.5	13.1	23.1	24.0
1922	2.619	86.6	12.8	23.5	25.5
1923	3,139	84.4	8.0	20.8	21.6
1924	3,185	83.1	7.8	18.4	18.8
1925	3,485	82.7	7.7	17.8	17.8
1926	3,818	80.7	6.5	17.0	16.4
1927	3,819	78.3	5.9	16.4	16.1
1928	3,806	77.4	6.2	16.4	16.3
1929	3,610	74.7	6.0	16.2	16.4
1930	2,674	63.4	6.2	17.0	17.5
1931	1.715	51.5	7.8	20.5	20.7
1932	797	39.2	10.6	24.9	26.6
1933	862	37.3	14.1	28.6	32.7
1934	1,165	43.3	14.6	29.3	33.8

Source: Figures collected by the Interstate Commerce Commission, some of which are published in *Statistics of Railways.*

[1] Comparable data are not available for 1919.

The most detailed—and the most adequate—figures bearing on the general question of under-maintenance in business establishments are those compiled by the Interstate Commerce Commission from the reports of steam railroads (Table 2). During the 1920's a declining trend is evidenced in the ratio of maintenance expenditures to gross operating revenue, with pronounced cyclical falls obvious in 1921 and in 1930-33. The trend is probably due to diverse price movements and to changes in technique. Further evidence is afforded by the ratio of man-hours of maintenance employees to car-miles of traffic. Use of this ratio avoids the difficulties arising from diverse price movements. The element of secular decline arising from changing technical methods remains, however, and obscures the conclusions to be drawn from the data. But even if we assume that the trend apparent in the preceding ten years continued through 1930-33, there is definite evidence of under-maintenance of some 15 per cent in 1933 relative to 1929. If deterioration goes on and maintenance be required whether or not traffic declines—and to some extent this is so—the degree of under-maintenance is considerably greater than this figure would suggest. Direct evidence of under-maintenance is provided by quantity figures on maintenance of track and equipment (Table 3). Beginning with 1930 the secular declines apparent in the replacement of rails and ties appear to have speeded up, and by 1932 and 1933 replacements were only a fraction of the 1929 amounts. The decline in rails replaced from 1929 to 1932 reached the large figure of 78 per cent; replacement of ties dropped one-half from 1929 to 1933. The piling up since 1929 of equipment requiring repairs confirms the evidence already presented.

CAPITAL CONSUMPTION IN CONSTANT AND CURRENT PRICES

Until gains, or even losses, are realized by exposure and sale in the market-place, capital assets are usually valued on the books of a business enterprise in terms of their original cost. As a consequence of this method of accounting, one supported by the requirements of the tax laws, depreciation charges represent an amalgam of non-contemporaneous prices. The various items of capital equipment and buildings are of diverse average spans of life. The anticipated useful life of the capital goods produced in 1929, for example, ranged from two years to one hundred, with concentrations (indicative of the approximate character of the estimates) at 10, 15, and 20 years (see Table 4). Half of the 1929 output in value had an anticipated life of between 10 and 30 years; one-fourth exceeded 30 years. We are not wrong in supposing, therefore, that even as late as 1929 capital goods purchased at 1913 and earlier price levels were still being depreciated.

The measures in Table 1 are strictly comparable in the sense that they represent the accounting estimates of capital consumption for the year to which they refer. As such their significance in an analysis of economic behavior cannot be denied. But to the extent that the price units actually

and alterations of buildings. For these and other reasons, comparisons between the figures in this *Bulletin* and those of Dr. Kuznets may not be made without sundry adjustments.

TABLE 4

VALUE OF OUTPUT OF BUSINESS CAPITAL GOODS IN 1929, DISTRIBUTED BY LENGTH OF ANTICIPATED USEFUL LIFE[1]

LIFE[2] (*years*)	VALUE OF OUTPUT (*percentage of total*)	CUMULATED VALUE OF OUTPUT (*percentage of total*)	DEPRECIATION RATE (*per cent*)
75	0.3	100.0	1-1/3
50	5.1	99.7	2
44	1.4	94.6	2-1/4
40	7.5	93.2	2-1/2
35	4.0	85.7	2-6/7
33	3.8	81.7	3
30	4.5	77.9	3-1/3
29	2.6	73.4	3-1/2
25	5.9	70.8	4
22	1.0	64.9	4-1/2
20	9.5	63.9	5
18	2.8	54.4	5-1/2
17	1.4	51.6	6
16	1.5	50.2	6-1/4
15	11.0	48.7	6-2/3
14	2.2	37.7	7
13	0.6	35.5	7-1/2
12.5	3.0	34.9	8
12	2.7	31.9	8-1/3
11	0.5	29.2	9
10	7.6	28.7	10
9	0.4	21.1	11
8	2.8	20.7	12-1/2
7	1.6	17.9	14
6	4.2	16.3	16-2/3
5	4.3	12.1	20
4	3.9	7.8	25
3	2.0	3.9	33-1/3
2.5	1.1	1.9	40
2	0.8	0.8	50
Total	100.0		

[1] The depreciation rates are taken from *Depreciation Studies—Preliminary Report of the Bureau of International Revenue* (1931). They have been appropriately weighted by the value of business capital goods of each average life span produced in 1929. The weights were derived from the *Census of Manufactures* and Dr. Kuznets' estimates of construction (*Bulletin 52*).

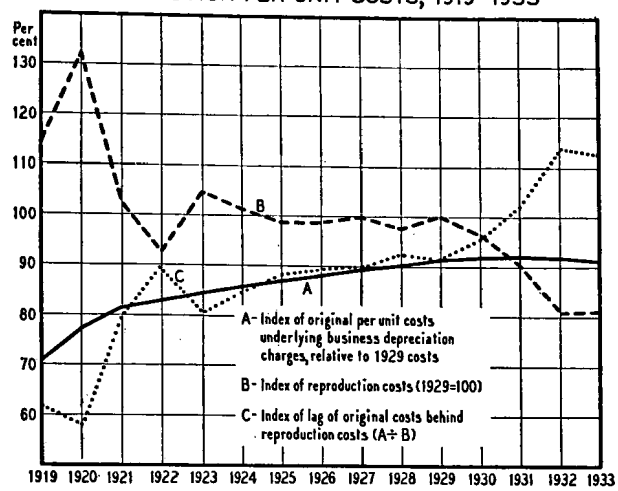
[2] Reciprocal of depreciation rate, not allowing for scrap value.

used in the evaluations are not contemporaneous, the meaning of the measures is obscured. Such items as repairs and fire losses are already priced in current units. But charges for depreciation, depletion, and retirements are in terms of prices paid at the time of original investment. If we are to modify these charges in order to express them in the prices of some common period, rather than in the original cost prices of many periods, a step must be taken beyond Table 1.

Price changes themselves result in one form of capital consumption (and formation) as it appears in the computations of business men. (Write-downs, the major type of entries taking specific account of price changes, have been omitted from the present set of figures, however.) In reducing the measures in Table 1 to contemporaneous price units, therefore, we are ignoring the effects of some of these

CHART 1

ESTIMATES OF ORIGINAL AND OF REPRODUCTION PER UNIT COSTS, 1919-1933



changes. From a social point of view this is defensible on the ground that a general deflation of values does not in itself signify the loss of physical capacity to produce.

As a result of the great fall in the purchasing power of the dollar during the War, the prices implicit in depreciation charges were usually lower than the prices actually paid for replacements. This situation, revealed by the indexes in Chart 1, prevailed during most of the period we are observing. The index portrayed by the solid line represents the original cost prices on the basis of which depreciation charges are computed, as a percentage of the corresponding 1929 prices.[a] Thus, in 1929 the original cost prices of the equipment and buildings being depreciated averaged about 9 per cent less than reproduction costs in 1929. In 1919 the prices originally paid for capital assets in existence averaged some 29 per cent less than 1929 prices. Not until the collapse of prices in 1930 did reproduction costs fall below the amounts set aside in depreciation reserves to make possible the replacement of equipment. The extent of the lag is indicated by a line representing the ratio of this index to an index of current prices.

It is this index of the original cost prices underlying depreciation charges that we must use in reducing the charges

[a] The index is an harmonic mean of various available indexes of prices of capital goods and construction costs weighted by the estimated depreciation charge applicable to the goods produced at the given prices. The harmonic mean of prices was employed because, when used to deflate a value series, it yields a series expressed in constant prices.

The underlying price indexes, especially those of construction, are not entirely satisfactory, and the weights used are rather rough. There can be little doubt, however, that the picture as a whole is as outlined here.

The figures are given in Appendix Table II, with some further details on the method of computation.

to constant dollars. The deflating index number is, in many respects, a peculiar price level. It measures one of the factors tying together different periods and suggests the extent of the influence of previous prices upon the present economic situation. As such it represents an institutional force of some weight and indicates one lagging element through which rising prices are a stimulus to business enterprise, and declining prices are a depressant.

The depletion charges in Table 1 also are composites including prices determined in different years. The adjustment of depletion charges, although somewhat analogous to modifying depreciation charges to reflect changes in prices, presents additional difficulties. Unlike depreciation charges, which are computed chiefly as a percentage of original cost, depletion charges are based on a more heterogeneous mixture of prices. The basic values used relate to discovery values as well as to cost, and in some instances depletion charges are calculated simply as percentages of gross income. In a stationary state we might measure depletion by an amount "adequate to provide some form of man-made capital equivalent in 'value' to this wear and tear." [9] In a dynamic industrial system, however, the task is more difficult and only the roughest approximations are possible. This is recognized in the entrepreneurial estimates themselves, and in the degree of reliability ascribed to them by business men and accountants.

[9] A. C. Pigou, *Economics of Stationary States* (Macmillan, 1935) p. 22.

In this *Bulletin* we attack the problem of reducing depletion charges to constant dollars by going directly to an index of output of raw minerals and forest products. This index is taken to represent the movements of these charges had they been expressed in constant dollars. The index of depletion thus derived may be expressed in dollars by the further assumption that the actual charges in some one year are correct. We select 1929 as this base. Only slightly different results are yielded by the use of other years.

To express depletion charges in 'current' dollars is even more difficult. The use of prices of mineral products or of mines and timber tracts is either incorrect or impossible. For our purposes we might, with some reason, use an index of the general price level or of the prices of capital goods. The latter is our most readily available choice. This assumes that among other things our knowledge of mineral resources is constant, that technological changes have been relatively unimportant, and that relative price changes have been small. These are bold assumptions, of course, involving as they do the absence of change in the chief elements characteristic of a dynamic economy. However, any other reasonable treatment would affect the total but slightly since depletion charges constitute a relatively small portion of our total.

The estimates in Table 1 other than charges for depreciation, depletion and retirements, are already in terms of current prices. Their deflation by appropriate indexes to convert them into constant dollars expressed in 1929 prices

TABLE 5

MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933, BY TYPE, IN TERMS OF 1929 PRICES[1]

(*in millions of dollars*)

YEAR	DEPRECIATION	DEPLETION	DEPRECIATION AND DEPLETION	REPAIRS, RENEWALS AND MAINTENANCE	DEVELOPMENT EXPENSE (MINING)	FIRE LOSSES	TOTAL
1919	4,662	409	5,071	2,225	292	110	7,698
1920	4,584	460	5,044	2,438	374	133	7,989
1921	4,569	363	4,932	2,638	279	190	8,039
1922	4,820	390	5,210	2,921	337	216	8,684
1923	4,952	523	5,475	2,905	374	202	8,956
1924	5,007	495	5,502	2,717	333	213	8,765
1925	5,249	511	5,760	2,753	356	223	9,092
1926	5,806	545	6,351	2,889	378	224	9,842
1927	5,789	548	6,337	2,878	323	187	9,725
1928	6,065	548	6,613	2,806	312	188	9,919
1929	6,443	596	7,039	2,906	321	181	10,447
1930	6,464	514	6,978	2,503	270	206	9,957
1931	6,391	424	6,815	2,173	192	197	9,377
1932	5,958	344	6,302	1,675	166	196	8,339
1933	5,765	372	6,137	1,646	172	131	8,086

[1] Derived by dividing the figures in Table 1 by the appropriate price indexes in Appendix Table II, except in the case of depletion charges, for which see the text.

The separation of depreciation from depletion charges, 1919-24, has been estimated with an error that is small relative to depreciation charges. The estimated breakdown is not given in Table 1 since the error in the above separation may be large, for depletion charges. As mentioned, depletion charges in constant dollars were derived by a procedure not making use of this estimate.

therefore requires no explanation. The deflators are given in Appendix Table II.

The results of the conversion of the estimates in Table 1 into fixed prices are presented in Table 5. The year 1929 has been selected as the base. The average of a broader period such as 1925-29 as the base yields much the same results as does the use of 1929. We are here measuring the declines in capital goods in terms of constant prices instead of the varying cost prices appearing on the books of business enterprises.

In Table 6 the same series are expressed in terms of the prices current year by year, that is, the estimate for 1925 is in terms of 1925 prices, and so on. Only the changes in per unit replacement costs are eliminated by expression of capital consumption in terms of either current or cost dollars: changes in values arising from obsolescence remain, and properly so. We thus make comparable our estimates of capital consumption and gross capital formation and in this way obtain a measure of net capital formation that is not ambiguous, from the economic point of view.

Expressing the estimates of depreciation in current prices implies measuring the capital consumption represented as if price changes were reflected periodically on the books of business enterprises. It enables us to distinguish between two types of capital consumption and thus aids in the analysis of the causes of capital consumption. This distinction is between the decline in value and the value of the decline of capital goods. But we need not attempt to name *the* correct concept. For certain purposes it is convenient to use the concept of capital consumption that is confined to measures of depreciation, depletion and obsolescence. For other purposes the inclusion of value changes other than those arising from depreciation, depletion and obsolescence is more suitable. The figures in Tables 5 and 6, in constant and in current dollars, follow the first concept. Obviously it does not agree with the *business* concept.

The various measures presented in Tables 1, 5, and 6 are brought together in Chart 2, which makes graphic comparison possible.

As was suggested earlier the rising trend of business depreciation charges was partly a consequence of the change in price levels from 1913 to the post-War period. Elimination of the price changes leaves a less rapidly rising trend, but still one averaging about 3.7 per cent per annum between 1919 and 1929 (2.6 per cent per annum between 1919 and 1933). The response to the cyclical declines in business in years prior to 1931 is slight. Only in the major recession of 1929-33 was there a substantial decline in business depreciation charges expressed in constant dollars.[10]

The movements of depletion charges are naturally more responsive to the fluctuations in general business owing to the use of per unit of output charges.

The absence of trend in repairs, renewals and mainte-

[10] An important factor making for this stability is the widely prevalent use of the straight-line method of accruing depreciation charges. Charging on the basis of volume of output would change the figures rather appreciably.

TABLE 6

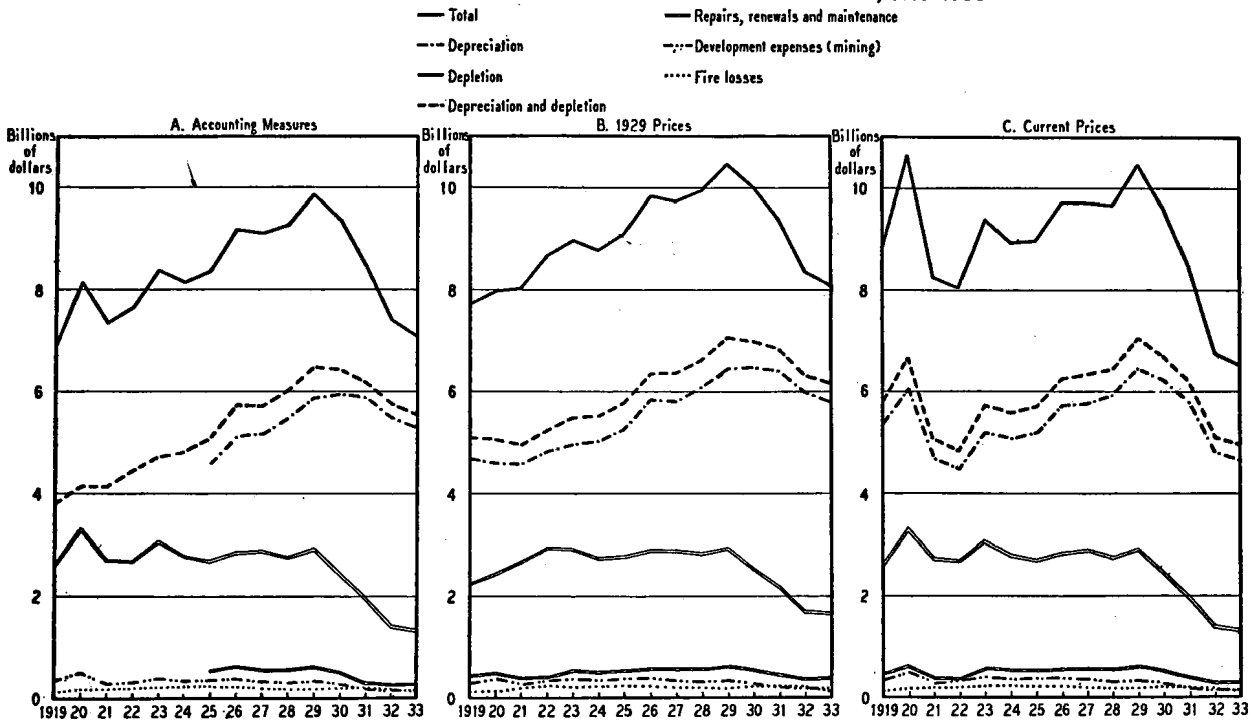
MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933, BY TYPE, IN TERMS OF CURRENT PRICES[1]

(*in millions of dollars*)

YEAR	DEPRECIATION	DEPLETION	DEPRECIATION AND DEPLETION	REPAIRS, RENEWALS AND MAINTENANCE	DEVELOPMENT EXPENSE (MINING)	FIRE LOSSES	TOTAL
1919	5,338	468	5,806	2,589	334	126	8,855
1920	6,060	608	6,668	3,305	495	176	10,644
1921	4,683	372	5,055	2,706	286	195	8,242
1922	4,468	362	4,830	2,682	312	200	8,024
1923	5,185	548	5,733	3,061	392	211	9,397
1924	5,077	502	5,579	2,762	338	216	8,895
1925	5,181	504	5,685	2,698	351	220	8,954
1926	5,731	538	6,269	2,841	373	221	9,704
1927	5,766	546	6,312	2,876	322	186	9,696
1928	5,913	534	6,447	2,735	304	183	9,669
1929	6,443	596	7,039	2,906	321	181	10,447
1930	6,218	494	6,712	2,442	260	198	9,612
1931	5,771	383	6,154	1,946	173	178	8,451
1932	4,814	278	5,092	1,365	134	158	6,749
1933	4,670	301	4,971	1,316	139	106	6,532

[1] The figures on repairs, development expense and fire losses are the same as in Table 1. As stated in the text, these types of capital consumption are already expressed in terms of current prices. The data on depreciation and depletion are derived from the corresponding figures in Table 5 (in constant prices), multiplied by appropriate indexes of current (reproduction cost) prices. These price indexes are the same as those given on the third line of Appendix Table II.

CHART 2
MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933



nance is a consequence of the overwhelming weight of steam railroads. This industry has shown little if any growth during the post-War decade. For the same reason there was no decline in the total in 1921: the railroads were busy restoring their equipment and other property to serviceable condition. The radical decline since 1929 is indicative of the under-maintenance already discussed.

Costs of developing mines have fluctuated with the current rate of mining output. Little can be said about fire losses although the decline since 1930 attracts attention.

The figures in Table 5, from which confusing price movements have been eliminated, make possible certain conclusions with respect to the relative importance of the several types of capital consumption:

1. An increasing proportion of business capital consumption is being recorded in the form of depreciation charges rather than charges for repairs and maintenance, chiefly as a consequence of the decline in the relative importance of steam railroads.

2. Recorded depletion charges and costs of development of our national resources declined in relative importance during the fifteen years under review.

3. Despite a large increase in the nation's capital stock, losses by fire showed no appreciable upward trend.

It is interesting to observe the influence of the high post-War prices and low depression prices upon the measures of capital consumption (Table 6). Substitution of these prices for the original cost prices underlying the accounting estimates of depreciation charges raises the values assigned to the earlier years of the period 1919-33, and lowers the values of the later years. The figures given in Table 6 provide a basis for a significant comparison with current estimates of gross capital formation of similar scope, just as do the figures in Table 1.

In deriving the figures in Tables 5 and 6 we have been forced to ignore the steady improvements in quality of equipment produced. Of course changes may be foreseen and investment made or withheld accordingly. If an investment is made under these circumstances it presumably is done in the anticipation that depreciation and obsolescence charges can be raised sufficiently to take account of the future rise in quality or fall in price. This may not be as exceptional as it seems offhand. If business men have, by long experience, been inured to such relative price changes (equivalent to improvements in quality with price constant), depreciation policies may come to anticipate them in the form of allowances for 'normal' obsolescence. However, the wide prevalence of straight-line depreciation charges means that in actual practice no attempt is made to pro-rate depreciation charges so that the anticipated losses are properly allocated over the life of the equipment. The entrepreneurial estimates of depreciation in Table 1

may therefore understate the decline in value of capital goods during the first half of their useful lives and overstate the decline in the second half. In an economy in which the volume of capital is fairly constant, however, the discrepancies tend to cancel one another. If the volume of capital is growing there may be something of a continuous lag in the level of capital charges, and therefore a continuous overstatement of annual profits. Until the day of reckoning, however, no difficulties may be anticipated. But, in fact, such a day occurs whenever there is a substantial slackening in the rate of growth of capital—that is, during every major depression.[11]

The difficulties of price and quality changes confront the business man as well as the economist. One difficulty is the possibility that no replacement price may be quoted or recorded in the market. This is merely a limiting case within the broad category of 'quality' changes. Here lie some of the chief causes of difficulty in accounting for capital consumption. It is partly because of changes in the quality of the new capital equipment flowing through the market that even great changes in price levels are ignored in the records of business. Quality changes are thus not simply something to be *eliminated*. Rather, from a scientific standpoint, they are something to be *analyzed*. The difficulties of adequately measuring capital consumed, of computing costs, and of pricing, arise in large part from such changes in 'quality.' It is these difficulties which help to explain some of the recognized inadequacies of current accounting methods and current price indexes.

With reference to the direction of influence of quality changes upon the indexes in Chart 1 the following may be ventured. If improvements in capital goods may be assumed to go on at a steady rate, then in order to reflect this progressive cheapening the index of current prices (the broken line in Chart 1) would be swung about the 1929 base so that the 1919-28 figures are raised and the 1930-33 figures lowered. Similar (but not exactly the same) would be the change in the solid line. The data represented by the dotted line would be least changed. But it is these figures which reveal the lag in which we are interested.

ESTIMATES OF CAPITAL CONSUMPTION AND THE MEASUREMENT OF PROFITS AND SAVINGS

Current methods of measuring capital consumption constitute an indispensable part of the procedure of estimating business profits, national income, savings, and national wealth. Any peculiarities characteristic of the determination by business men of their current position will thus affect not only these measures but also the influence exerted by them upon economic behavior. The computations most immediately involved are those concerned with business profits and savings. Measures of capital consumption, indeed, come into existence primarily as part of these computations. It is worth indicating the influence, upon current measures of profits and business savings, of two characteristics of business measurements—the use of original cost and of the straight-line depreciation formula in the estimation of depreciation charges.[12] The influence of the cost base is most prominent over long periods. During ordinary business cycles it is the prevailing use of some variety of the straight-line formula that appears to affect depreciation charges most prominently. Let us consider first the use of original cost as it affects depreciation estimates and measures of business savings.

Current prices may differ from original cost prices because of secular movements in the prices of capital goods or because of movements constituting parts of business cycles. But the short cyclical changes in the prices of capital goods are relatively small.[13] During recent business cycles of moderate amplitude there has been relative stability in current prices of capital goods and differences between them and the prices underlying book values have not fluctuated to any important extent. Secular movements of prices result, however, in a cumulative deviation of replacement prices from book values, which may become great. It is these larger movements that interest us in the present comparison. Even prosperity replacement costs may be on a lower secular level than original cost prices; and even depression replacement costs may be on a higher secular level than original cost prices. The magnitude of these differences in a specific historical period is indicated in Table 7.

The estimates in Table 7 of corporate savings for 1919-33 are derived, naturally, by a series of subtractions from gross income in which an estimate of depreciation in original cost prices is one of the items subtracted. If this estimate of depreciation be expressed in terms of current replacement cost, instead of in terms of original cost, we have a rather different estimate. The difference between the two (the third column) is rather large in relation to corporate savings. Modified estimates of corporate savings, in which account is taken of the differences in column

[11] In so far as there is actual shortening of life, depreciation charges may understate actual depreciation and obsolescence, account being taken of the resulting losses only on retirement and abandonment of assets. However, as we have noticed, the depreciation charges available to us tend to be estimated at higher than commonly accepted rates and indeed explicitly include an allowance for 'normal' obsolescence. To that extent obsolescence and similar declines in value are allowed for regularly.

[12] Other business practices, such as the valuation of inventories at the lower of cost or market prices, are also of interest in this connection. But here we restrict our attention to the characteristics mentioned.

[13] See Frederick C. Mills, Changes in Prices, Manufacturing Costs and Industrial Productivity, 1929-1934, *Bulletin 53* of this series.

TABLE 7

MEASURES OF DEPRECIATION AND OF CORPORATE SAVINGS, 1919-1933

ALL CORPORATIONS IN THE UNITED STATES [1]

(*in millions of dollars*)

(1) YEAR	(2) CORPORATE SAVINGS [2]	(3) DIFFERENCE BETWEEN DEPRECIATION AT COST PRICES AND AT CURRENT PRICES	(4) CORPORATE SAVINGS, MODIFIED (2) + (3)
1919	4,310	—1,000	3,310
1920	1,380	—1,390	— 10
1921	—2,670	— 570	—3,240
1922	1,660	— 290	1,370
1923	2,410	— 640	1,770
1924	1,440	— 490	950
1925	2,810	— 390	2,420
1926	2,180	— 400	1,780
1927	950	— 390	560
1928	2,330	— 290	2,040
1929	1,350	— 380	970
1930	—4,110	— 190	—4,300
1931	—6.040	80	—5,960
1932	—6,550	450	—6,100
1933	—3,060	390	—2,670
Total	—1,610	—5,500	—7,110

[1] Excluding tax-exempt and life insurance companies. The data basic to the figures in columns (2) and (3) are derived from *Statistics of Income*.

[2] Net income less cash dividends paid to individuals. For 1929-33 profits and losses derived from the sale of capital assets have been eliminated.

(3), are given in the last series of figures in the table. At the foot of the table appear algebraic totals for the entire period surveyed. Corporate savings as ordinarily computed reached a total negative figure of 1,610 million dollars, while the modified measures added up to a negative figure of 7,110 million dollars. The cumulated difference, arising out of the discrepancy between original and reproduction cost, amounted to 5,500 million dollars, also negative. The latter figure is very large, in relation to the estimated cumulated corporate savings.

The figures suggest the extent to which business savings tend to be overstated by the use of cost bases in the estimation of depreciation charges when prices are high relatively to preceding periods when investments were made. When prices are relatively low, business savings tend to be understated. We thus see that a considerable fraction of the apparent corporate savings put aside by business organizations during the early part of the 'twenties was required to restore their capital equipment at the relatively high price levels prevailing. The free funds actually available for new investment were smaller than appeared in the income accounts of business enterprises. Where dividends were sustained, at a level equal to that of computed profits, capital was in fact being depleted.[14]

Here we have reflected one factor making for the stimulation of business enterprise when the secular movement of prices is upward, and the depression of business enterprise when the secular movement of prices is downward. The reason for this phenomenon is found, in part, in the tendency of business men to look to the money counters in which business is transacted as the final criterion and purpose of their activities. When the purchasing power of money becomes the goal and measure of business enterprise, as it may in a runaway inflation, the change in business behavior is great. But inflation must go far before the rules of the game are changed.[15] In the absence of such radical changes the nominal character of money and prices is recognized only sporadically and to a small degree. This occurs, of course, when revaluations of assets are made through appraisal or other less objective estimation. To the extent that business men do in fact recognize the significance of secular changes in price levels, the figures in column (4) of Table 7 represent their estimates of savings. To the extent that they do not, their estimates are those in the second column of the table. Somewhere between these two limits, and probably closer to the figures in column (2), are the entrepreneurial measures of annual savings.

We turn now to another characteristic of business measures of depreciation, already mentioned: their remarkable steadiness. In spite of large fluctuations in gross value of product, physical volume of output, and consequently in the use made of capital equipment, depreciation costs allocated to specific years reveal relatively little change. Cyclical declines in 1921, 1924, 1927, and 1930-32 are definitely impressed even upon annual series of physical output and net income. Gross income declined in 1921 and 1930-32, and rose only fractionally in 1924 and 1927. Depreciation charges, in terms either of original cost or of current replacement cost, reveal no declines at all, except in the most recent period. The averages of the year-to-year changes in the last two series (Table 8) are minor compared with

[14] The same reasoning holds to a great extent where capital consumption is understated not because of the use of the cost base, but because of failure to take obsolescence adequately into account. The situation of the street railways is already history.

It must be noted that the figures in Table 7 refer to the aggregate of all corporations in the United States. If we were to confine our attention to those industries in which depreciation charges bulk large, in comparison with business savings, the influence of price changes would be even greater than is indicated in the table.

[15] Current methods of estimating depreciation charges are but one element in the situation making for stimulus or drag when the secular movement of prices is up or down, and probably not the most important. Lagging wage rates, fixed interest charges, and other costs, must be considered. Even of these other costs, however, the same fundamental reason is at the bottom, namely, the tendency to rely upon money as the ultimate standard of valuation.

TABLE 8
AVERAGE ABSOLUTE ANNUAL CHANGES IN PHYSICAL OUTPUT, GROSS AND NET INCOME, AND DEPRECIATION CHARGES, 1919-1933

ALL CORPORATIONS IN THE UNITED STATES[1]

	As a percentage of	
	1919-33 average value	*1929 value*
Physical volume of output	10.9	8.5
Gross income	11.8	8.8
Depreciation charges		
Expressed in original cost prices	6.8	5.4
Expressed in 1929 prices	4.9	4.0
Net income	60.0	30.7

[1] The index of physical volume of output covers industrial production and trade. It is computed by Persons and Foster, *Review of Economic Statistics*, August 15, 1933, p. 155. The 1933 figure is estimated.

Gross income does not include tax-exempt income. The original data are from *Statistics of Income*.

The depreciation charges are also from *Statistics of Income*. They were expressed in 1929 prices by dividing by the index on the first line of Appendix Table II.

The net income is based on compiled net profits after taxes, excluding dividends received from other corporations and gains or losses on the sale of capital assets (*Statistics of Income*).

those of the other series, and are due primarily to the secular movement, rather than to the cyclical fluctuations.

Since the estimates of net income are remainders after depreciation (among other items) has been subtracted from gross income, their violent fluctuations are to be ascribed, in part at least, to the absence of large movements in depreciation charges. And this is a consequence of the widely prevalent use of the straight-line depreciation formula or other formulae not taking directly into account fluctuations in the volume of output. Here, also, the use of this particular type of formula, rather than of one that would make depreciation charges reflect the rate of production, appears to be explained chiefly by the limited visibility available to business men. The longevity of a machine or a building may be more readily and accurately predicted than the use, in terms of volume of output, that will be made of it. Another, though minor, contributing factor may be the habit in many business computations of working with rough magnitudes. This, in turn, may be a consequence of the relatively large cost inherent in fine measurements, or of the factor already mentioned—the belief that more accurate measures are impossible.

A further factor may be the continuous decay which to some extent goes on in capital goods whether they be used or not. But to the extent that the loss of value of capital goods is not simply a function of time, the straight-line method of allocating depreciation charges appears to be rigid in its lack of discrimination among time periods with varying volumes of output. Similarly, to the extent that the loss of value is directly related to the volume of output, the maintenance method used by many public utilities is too elastic, resulting in charges for maintaining capital that are of greater cyclical amplitude than is output (see Table 2).

CONCLUDING REMARKS

In this *Bulletin* we have been concerned chiefly with the available data on capital consumption, and with some of their characteristics. We have tried to indicate the reservations that must be made in using these materials, and have called attention particularly to the ambiguities resulting from changing prices. The relation of estimates of capital consumption to the measurement of profits and of corporate savings was indicated.

An attempt to learn what we can about the negative items in the nation's capital account involves more than the compilation of measures of their extent and fluctuation. The nature of the estimates themselves must be considered, for we must resort to business computations for our figures. Even if the consumption of capital is an objective fact, we become aware of it only through the minds of those who keep the records. These records are, further, influenced by efforts to control profit estimates and by other factors.

It is essential to note this fact that all measures of capital consumption are estimates. We do not know how to handle efficiently the problem of measuring capital consumption in a dynamic world. Technological and price changes 'disturb' business computations and forecasts, as well as judgments concerning the past. Reluctance to acknowledge specific instances of capital evanescence is common. The factors that make for profits make also for difficulty in the computation of profits and all related estimates. In the complex changing situation business men cannot see far enough, or clearly enough. It is partly for this reason that they tend to hold fast to the unchanging reality of cost prices, and it may be partly for this reason that waves of optimism and pessimism tend periodically to sweep over business enterprise.

FORTHCOMING PUBLICATIONS

The third *Bulletin* of the 1936 series, to be issued this summer, will be by Wesley C. Mitchell: Characteristics of the Business Cycle, 1927-1933.

Chapter III of Dr. Mitchell's second volume—*Business Cycles: Analysis of Cyclical Behavior*—has been mimeographed and is ready for distribution. Copies will be sent to all who have already purchased Chapters I and II. We still have a few copies of the first two chapters, and the three will be sent upon receipt of $1.00.

Ebb and Flow in Trade Unionism, in which Dr. Leo Wolman gives trade union membership from 1897 to date and discusses events since his volume, *The Growth of American Trade Unions, 1880-1923,* appeared, will be published next month (300 pp., 5 charts, 48 tables, price $3.00). Orders are being taken now. Some copies of the former volume are still available. As long as the supply lasts the two volumes may be purchased for $4.00.

APPENDIX TABLE I

ACCOUNTING MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933, BY TYPE AND INDUSTRY[1]

(in millions of dollars)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
Agriculture and related industries															
Depreciation							923	916	921	921	940	919	870	831	786
Depletion							23	24	22	22	25	17	12	8	10
Depreciation and depletion	1,020	1,083	957	888	878	896	946	940	943	943	965	937	882	838	796
Mining															
Depreciation							295	245	242	216	239	203	203	173	160
Depletion							297	289	242	222	254	191	113	106	115
Depreciation and depletion	508	613	542	584	705	687	592	534	484	439	492	394	316	280	279
Development expense	334	495	286	312	392	338	351	373	322	304	321	260	173	134	135
Manufacturing															
Depreciation							1,493	1,640	1,718	1,795	1,879	1,945	1,849	1,681	1,631
Depletion							156	263	244	268	277	249	126	121	114
Depreciation and depletion	1,152	1,293	1,287	1,485	1,573	1,552	1,649	1,903	1,962	2,063	2,156	2,194	1,974	1,802	1,745
Other industries (trade, construction, service, miscellaneous)															
Depreciation							741	970	848	938	1,033	1,058	1,049	1,029	920
Depletion							28	6	6	10	6	5	14	4	3
Depreciation and depletion	475	521	568	594	630	678	769	976	854	948	1,039	1,063	1,063	1,033	923
Public utilities and transportation															
Depreciation							588	720	794	898	983	1,023	1,123	1,062	990
Depletion							8	24	21	25	29	27	23	22	15
Depreciation and depletion	369	337	436	455	497	534	596	745	814	923	1,011	1,049	1,146	1,084	1,013
Repairs, renewals and maintenance	2,318	3,016	2,358	2,315	2,616	2,389	2,408	2,501	2,436	2,355	2,416	2,080	1,658	1,222	1,171
Retirements (loss on retired property and delayed income debits), steam railroads	11	10	30	52	66	49	54	59	61	50	86	90	105	63	113
Finance and real estate (non-residential)															
Depreciation							467	559	582	654	710	701	687	636	650
Depletion							12	8	5	8	6	4	3	2	2
Depreciation and depletion	263	297	307	378	364	428	479	567	587	662	716	706	690	638	652
Major repairs and alterations	271	289	348	367	445	373	290	340	440	380	490	362	288	143	143
Unallocated															
Fire losses	126	176	195	200	211	216	220	221	186	183	181	198	178	158	100

[1] The data on business depreciation and depletion are based on corporate figures published in *Statistics of Income*. For farming, estimates of the Department of Agriculture were used, with several minor modifications. Non-corporate figures were estimated by stepping up the corporate figures by ratios obtained from the Censuses of Manufactures, Mines, Distribution, and Construction. Separate data for depreciation and depletion are not available for years prior to 1925.

The figures on repairs, renewals and maintenance by public utilities were collected from *Statistics of Railways*, the Census of Electrical Industries, and estimates of the Federal Employment Stabilization Board, interpolated by data published in several industrial journals and corporate reports. Retirements of equipment by steam railways are also from *Statistics of Railways*. Major repairs and alterations in the real estate field (and also of homes) are based on figures relating to permits published in the *Monthly Labor Review*, supplemented by data from the Bureau of Labor Statistics.

Development expenses in mining industries are derived from data in the Census of Mines and Quarries, *Report on Crude Petroleum and Its Liquid Refined Products* (U. S. Tariff Commission), and *Preliminary Report on a Survey of Crude Petroleum* (Department of the Interior); with interpolations based on *Mineral Resources* (Bureau of Mines).

Total fire losses are estimated by the National Board of Fire Underwriters. To these was applied a percentage based on the ratio of value of business capital goods to the total national wealth subject to fire hazards (Federal Trade Commission estimates of national wealth, 1922).

APPENDIX TABLE II

INDEXES USED IN DEFLATING ACCOUNTING MEASURES OF BUSINESS CAPITAL CONSUMPTION, 1919-1933[1]

(prices in 1929=100)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
Depreciation[2]	70.8	77.0	81.4	82.9	84.2	85.7	86.9	88.0	89.2	90.2	91.1	91.9	92.1	91.9	91.5
Repairs, renewals and maintenance[2]	116.4	135.6	102.6	91.8	105.4	101.7	98.0	98.3	99.9	97.5	100.0	97.6	89.6	81.5	80.5
Development expense, Fire losses[4]	114.5	132.2	102.5	92.7	104.7	101.4	98.7	98.7	99.6	97.5	100.0	96.2	90.3	80.8	81.1

[1] Depletion charges expressed in constant prices were obtained directly, without use of a price index; see explanation in the text.

[2] This is an harmonic mean of various indexes of the prices of capital equipment, weighted by the amount of depreciation charges based on each year's price. In 1929, for example, depreciation was charged on equipment and buildings purchased in 1929, 1928, 1927, and so on. The deflator for 1929 depreciation charges must therefore be a weighted average of 1929, 1928, 1927, ..., prices, the weights being the 1929 depreciation on the goods purchased in each of these years. This weighted average, relative to 1929 prices, is 91.1. To express the 1929 depreciation charges in terms of 1929 prices, it is necessary to divide the charges by this average, 91.1. The various underlying price indexes include the following: Railroad construction costs (Interstate Commerce Commission), machine tools and wood

Appendix Table III

Measures of Capital Consumption, Residences, and Related Price Indexes, 1919-1933

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
A. ACCOUNTING MEASURES OF CAPITAL CONSUMPTION (*in millions of dollars*)[1]															
RESIDENCES, RENTED															
Non-farm															
Depreciation	266	278	294	326	371	421	476	532	579	619	651	673	682	684	682
Major repairs and alterations	89	93	111	114	135	110	83	93	111	109	99	62	41	28	32
Farm															
Depreciation	28	31	23	24	24	24	24	25	25	25	25	25	22	20	20
RESIDENCES, OWNER-OCCUPIED															
Non-farm															
Depreciation	232	249	269	304	355	413	478	547	608	666	717	741	750	753	751
Major repairs and alterations	99	108	131	138	168	140	109	126	155	155	145	90	60	40	47
Farm															
Depreciation	395	428	326	333	334	333	342	344	348	344	349	342	307	284	284
UNALLOCATED															
Fire losses	63	89	98	99	105	108	111	111	94	92	91	99	89	79	53
ALL RESIDENCES															
Depreciation	921	986	912	987	1,084	1,191	1,320	1,448	1,560	1,654	1,742	1,781	1,761	1,741	1,737
Major repairs and alterations	188	201	242	252	303	250	192	219	266	264	244	152	101	68	79
Fire losses	63	89	98	99	105	108	111	111	94	92	91	99	89	79	53
Total	1,172	1,276	1,252	1,338	1,492	1,549	1,623	1,778	1,920	2,010	2,077	2,032	1,951	1,888	1,869
B. INDEXES USED IN DEFLATING ACCOUNTING MEASURES OF CAPITAL CONSUMPTION (*prices in 1929=100*)															
ALL RESIDENCES															
Depreciation[2]	43.4	45.1	47.1	49.9	53.5	57.5	61.3	64.7	67.4	69.7	71.6	72.9	73.9	74.6	75.2
Major repairs and alterations, Fire losses[3]	95.9	121.4	97.5	84.3	103.4	104.1	99.9	100.5	99.6	99.9	100.0	98.0	87.6	75.8	82.2
C. MEASURES OF CAPITAL CONSUMPTION, IN TERMS OF 1929 PRICES (*in millions of dollars*)[4]															
ALL RESIDENCES															
Depreciation	2,122	2,186	1,936	1,978	2,026	2,071	2,153	2,238	2,314	2,373	2,433	2,443	2,383	2,334	2,310
Major repairs and alterations	196	166	248	299	293	240	192	218	267	264	244	155	115	90	96
Fire losses	66	73	101	117	102	104	111	110	94	92	91	101	102	104	64
Total	2,384	2,425	2,285	2,394	2,421	2,415	2,456	2,566	2,675	2,729	2,768	2,699	2,600	2,528	2,470

[1] The depreciation charges are accounting measures in the sense that they are computed in accordance with ordinary accounting practice: it is doubtful whether most owners of private residences make formal estimates of depreciation. Depreciation charges on farm homes are based on figures of the Department of Agriculture and the Census of Agriculture. Depreciation on non-farm residences are estimates derived from the value of owned homes and rentals paid in 1930 (Census of Population); new construction of residences (permits published in the *Monthly Labor Review*, contracts awarded compiled by the F. W. Dodge Corporation, and permits compiled by J. R. Riggleman); rents paid and received by corporations (*Statistics of Income*); rents paid by wage earners (*Monthly Labor Review*); ratio of depreciation charges to rentals received by realty corporations (Bureau of Internal Revenue, unpublished figures); and depreciation rates listed by the Treasury Department (*Depreciation Studies—Preliminary Report of the Bureau of Internal Revenue*, 1931).

Major repairs and alterations of homes are based on building permits published in the *Monthly Labor Review*, supplemented by unpublished data from the Bureau of Labor Statistics.

Total fire losses are estimated by the National Board of Fire Underwriters. To these was applied a percentage based on the ratio of value of residences to the total national wealth subject to fire hazards (Federal Trade Commission estimates of national wealth, 1922).

[2] Obtained by a procedure similar to that outlined in footnote 1 of Appendix Table II. The basic underlying cost index was that of the *Engineering News-Record*. In this case it was necessary to use prices of years preceding 1913.

[3] Index of building costs, *Engineering News-Record*.

[4] Derived by dividing the figures in Section A by the appropriate price indexes in Section B.

(*Notes to Appendix Table II continued*)

working machinery (American Appraisal Company), commercial cost of cars (Brill), processed capital equipment (National Bureau of Economic Research), construction costs (American Appraisal Company, Richey, Tuttle). Owing to certain provisions in the income tax law, it is not necessary to use prices prior to 1913.

The weights were obtained from estimates of gross capital formation (*Bulletin 52*, National Bureau of Economic Research; *Census of Manufactures*, U. S., Massachusetts, and Pennsylvania, and volume of construction, Dodge Co. and Riggleman) and the depreciation rates listed by the Bureau of Internal Revenue.

[3] Weighted arithmetic average of five indexes of per unit maintenance costs: steam railroads—ways and structures (I.C.C.), steam railroads—equipment (I.C.C.), electric light and power costs (Richey), electric cars (Brill), construction (American Appraisal Company).

[4] Weighted arithmetic average of the indexes listed in footnote 2.

COOPERATIVE RESEARCH

It has been customary to give, in the June issue of the *Bulletin,* an account of our annual planning conference. This year it has been postponed because our cooperative program made so much progress after the Shawnee Conference in September (*see Bulletin 58*) that it was felt desirable to appoint an Executive Director who could devote time to its constructive planning and to following its various features. Happily Joseph H. Willits, Dean of the Wharton School of Finance and Commerce, University of Pennsylvania, a member of our Board of Directors since 1927 and its present Chairman was persuaded to undertake the task. One of his first duties, which begin in the autumn, will be to confer with representatives from the cooperating universities to report on the year's progress and to plan for improvement and expansion of a coordinated research program.

In *Retrospect and Prospect* Dr. Mitchell mentioned the establishment of the secretariat for the Price Conference, under the chairmanship of F. C. Mills, and outlined the projects suggested at the Income Conference, of which Simon Kuznets was elected chairman. We give a brief summary of developments since the publication of *Retrospect and Prospect.*

Income

In accordance with the instructions of the Income Conference the Executive Committee has set up a separate committee on concepts and terminology: Dr. Morris Copeland, chairman; Dr. Winfield Riefler and Dr. Simon Kuznets. The task of this committee is to prepare a report containing a clear exposition of the various terms, with the object of bringing about a better understanding of their significance and application and thereby helping to promote a greater uniformity of usage.

A committee was also organized to consider the possibility of a comprehensive tabulation of the individual state income tax returns for Wisconsin. Harold M. Groves was elected chairman, and Simeon Leland, Simon Kuznets and Aaron Director members. The committee met at Chicago with a group from Wisconsin, including Harry Jerome of the University of Wisconsin and Leonard Krueger of the Wisconsin State Tax Commission. A small subcommittee undertook to work out plans for the tabulation project, and submit it for consideration to the Works Progress Administration of the State of Wisconsin.

Arrangements have been made to have several problems in the field of income and wealth measurements discussed at the annual meeting of the American Economic and Statistical Associations. The Executive Committee of the Conference has arranged for the presentation of reports on the following topics: (1) Treatment of Government Income and Expenditures in Its Bearing upon the Measurement of National Income and Wealth (by Professor Gerhard Colm of the Graduate Faculty of the New School for Social Research); (2) The Concept of Income Employed in Income Taxation (by Professor Carl Shoup of Columbia University); (3) Problems in Measurement of Purchasing Power of Net Farm and Net Urban Income (by a member of the staff, not yet designated, of the Bureau of Agricultural Economics); (4) Problems in the Measurement of Labor Income (by Mr. Solomon Kuznets of the U. S. Bureau of Labor Statistics). The discussants of these reports, who have to date accepted our invitation to act in that capacity, are J. D. Black, M. R. Benedict, J. R. Blough, Mabel Newcomer, and Leo Wolman.

Prices

Further attention has been given to the possibility of cooperative research on the price problems of industry and trade. A meeting of industrial experts and economists was held at the National Bureau on February 21. The members of this group were agreed on the desirability of attaining the following objectives:

1. More accurate determination of the actual price changes among manufactured goods, account being taken of changes in quality and in design.
2. The measurement of production costs, both average and differential.
3. The measurement of changes in industrial productivity, and the determination of cost and price changes accompanying them.
4. The measurement of price-quantity relations (i.e., the determination of changes in demand associated with given changes in price).

The Price Conference also is planning for round table discussions of problems of vital concern to its field at the next meeting of the scientific societies. Meanwhile it is arranging for small committees of economists and industrial experts whose business it will be to explore the problems that would be encountered in given industries, and to frame programs of research for these industries. Such a committee has been set up in the textile field, under the chairmanship of S. J. Kennedy, an economist for the Pacific Mills. It is proposed that similar committees be established for coal, boots and shoes, and automobiles. The several programs of research that will be framed by these committees will be circulated in advance of the December meetings, and will be subjected to critical review at that time. With carefully tested programs in hand, it is hoped that means will be found for prosecuting one or more of these industry studies.

The Committee is also collaborating with groups at Harvard, Pennsylvania, and Pittsburgh Universities, who are studying or planning to study prices and costs in American industries.

National Bureau of Economic Research

BULLETIN 62

DECEMBER 7, 1936

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Revaluations of Fixed Assets, 1925-1934

Copyright 1936, National Bureau of Economic Research, Inc.

SOLOMON FABRICANT

SIGNIFICANCE OF REVALUATIONS

BALANCE sheet values of assets constitute essential data in estimates of wealth, capital, income and profits. Rational use of these estimates cannot be made by economists, statisticians or investors without some consideration of the manner in which assets are valued by business men and accountants.

Of particular interest at present are revaluations of fixed assets. The write-down in 1935 of the property account of the United States Steel Corporation by 270 million dollars, or 17 per cent of the net value in the account, is one spectacular instance. Business men are confronted by a dynamic situation in which price levels fluctuate, obsolescence of machines and plant becomes evident, profit-making opportunities appear and disappear, and business goodwill grows or vanishes. If their records are to reflect the changing reality about them, business men are forced to revalue their assets.

These revaluations possess considerable significance. They constitute clues to the formation and consumption of capital as it fluctuates with changes in tastes, technology and institutions. As such they are essential data in the analysis of changes in capital that is being made at the National Bureau.[1] From another point of view they reflect the discrepancies between original cost and capitalized value that arise from perpetual economic flux. Further, revaluations constitute exceptions to the usual rules of accounting. Their number and amount suggest the degree to which accounting technique has been kept in its place as a servant. For rules and procedures tend to become tyrants: they acquire the dignity and influence of custom and their origin and purpose are lost sight of.

[1] "Gross Capital Formation, 1919-1933" (*Bulletin 52*, November 15, 1934) and "Measures of Capital Consumption, 1919-1933" (*Bulletin 60*, June 30, 1936).

The 'book values' found in accounting records do not represent past or present market values in any simple manner. Deductions from original cost, manifested by estimates of reserves for depreciation and depletion, and revaluations through write-ups and write-downs, give rise to book values that reflect neither original cost nor present market value. They are the product of a valuation process going on beside the market-place, not in it. Economists have envisaged an extension of value theory to this valuation process outside the market.[2] The results of our investigation are offered as a contribution towards such a supplement to the theory of market value: the theory of book value.

How important are revaluations of assets? How many concerns enter write-ups and write-downs in their books? Which particular groups of fixed assets are especially involved? Do the number and amount of revaluations vary from time to time? What reasons are usually offered in justification of revaluations? In what way may they be expected to affect computations of profits and other economic measures? These are some of the questions considered in this *Bulletin*.

THE DATA AND THEIR CHARACTERISTICS

Our analysis is based on data novel in degree of detail and comparability. They are derived from reports made by listed industrial corporations to the Securities and Exchange Commission. As sworn statements, certified by public accountants, and made in reply to a uniform and specific question, they lend themselves readily to summary.

The question asked concerning write-ups and write-downs, which appears in 'Form 10, Application for Registration Pursuant to Section 12 (b) and (c) of the Securities Exchange Act of 1934', is as follows:

[2] David Friday, "An Extension of Value Theory", *Quarterly Journal of Economics*, February 1922.

If, since January 1, 1925, there have been any increases or decreases in *investments,* in *property, plant* and *equipment* or in *intangible assets,* resulting from substantially revaluing such assets, state:

(1) In what year or years such revaluations were made.

(2) The amounts of such write-ups or write-downs, and the accounts affected, including the contra entry or entries.

(3) If, in connection with such revaluations, any adjustments were made in related reserve accounts, state the accounts and amounts, with explanations.

The 'Instruction Book for Form 10 for Corporations', in explanation of this question, states:

These items do not refer to adjustments made in the ordinary course of business, but only to major revaluations made for the purpose of entering in the books current values, reproduction costs, or any values other than original cost.

Our study is confined to an examination of reports of 208 large industrial concerns (mining and manufacturing chiefly, with a few from trade, construction and service) covering the years 1925-34, inclusive. The companies were chosen at random from the file of S. E. C. reports of the New York Stock Exchange and therefore include only corporations listed on it. Consolidated reports, rather than the individual reports of related companies, were used wherever possible.

The data are further limited in that only solvent companies in existence in 1934 are included. Revaluations of assets made by corporations prior to consolidation or liquidation are omitted. While these revaluations may reach large amounts per company, the number of concerns involved is small. Still another qualification, related to the preceding, is that only the history of the existing legal entity is fully covered.[3] In our analysis corporations coming into existence before and after 1925 are distinguished to avoid the statistical errors that might otherwise arise.

The size of the sample may be judged by a comparison of the assets of the sample corporations with the assets of all corporations, in the comparable industrial groups, in the United States.

	ALL REPORTING CORPORATIONS 1933[1]	SAMPLE 1934	SAMPLE AS PERCENTAGE OF ALL CORPORATIONS
	(*millions of dollars*)		
Property, plant and equipment	34,802	6,412	18.4
Investments	12,641	1,193	9.4
Total assets	84,246	11,684	13.9

[1] SOURCE: *Statistics of Income for 1933.* The 1934 figures are not yet available. Intangible assets are not published separately by the Treasury Department.

[3] According to an amendment to the instruction book (Release No. 191, Securities Exchange Act of 1934, April 24, 1935) revaluation by predecessor companies must be included in Form 10 only if: "(1) The registrant is the successor to a predecessor and at the time of such succession continued under substantially the same ownership and control as such predecessor; and (2) the registrant succeeded to: either (a) substantially all the assets of such predecessor; or (b) a substantial portion thereof and such portion was segregated on the books of such predecessor." It seems that before the date of this amendment there was no requirement that entries in the books of predecessors should be reported, and in fact they were omitted in most cases.

[4] Of the 208 companies 55 have assumed a new legal habit since 1924—a large fraction, for many are really new only in a strictly legal sense. The relative number of new corporations emphasizes the need for paying attention to changes in capital and assets in the process of reorganization, consolidation, or modification of corporate being, in any adequate historical account of the course of profits and modifications in capital structures of business enterprises.

[5] The importance of the revaluations is judged here in relation to the net book value of the corresponding assets at the end of 1934. Since some of the revaluations consisted of completely writing off an asset, the ratios derived may be very large, sometimes infinitely so. It would perhaps have been preferable to compare the amount of revaluations with the book value of the corresponding asset before revaluation. But the ratios used here are adequate for our purposes, and cost considerably less effort to obtain.

TOTAL NUMBER AND VOLUME OF REVALUATIONS

Of the 208 reports examined as many as 157 indicated some write-up or write-down during the ten years 1925-34. To the question whether there had been any substantial revaluation of investments, property, plant and equipment, or intangible assets, three-fourths of the companies answered in the affirmative.

Some companies, of course, were not in existence during this entire period, and therefore had less opportunity to revalue their assets.[4] However, the difference in the proportion of companies reporting revaluations is slight, when we distinguish between those incorporated before and since January 1, 1925, 76 against 75 per cent. The largest proportion reporting revaluations, 86 per cent were companies organized during the War years 1915-20 (Table 1).

TABLE 1

CORPORATIONS REPORTING REVALUATIONS OF FIXED ASSETS, 1925-1934, NUMBER

PERIOD DURING WHICH INCORPORATED	CORPORATIONS IN SAMPLE (number)	CORPORATIONS REPORTING REVALUATIONS	
		Number	Percentage of total
Before 1901	33	24	73
1901-1914	47	30	64
1915-1920	57	49	86
1921-1924	16	13	81
Before 1925	153	116	76
1925-1934	55	41	75
Total	208	157	75

Most of the revaluations, as percentages of the amount of corresponding assets,[5] were reported for intangible assets, investments being second, and property, plant and equipment last. In terms of actual amounts of revalua-

tions, however, the order is different. The amounts themselves are most significant in considering such matters as the evaluation of net worth. But in so far as the values of individual assets are concerned, the percentages are of primary interest (Table 2). Write-ups of property account were surprisingly small, the total for the decade falling well below depreciation charges for one year. For both intangibles and investments the percentages were much greater, 16 and 18 respectively.

Total write-downs exceeded write-ups of property, plant and equipment, and intangibles, and were roughly equal in investments. This preponderance of write-downs is in accord with what we know of the economic history of the period 1925-34. Write-ups during and immediately following the War probably exceeded write-downs, but that period lies outside the scope of the records analyzed here.

In percentages of the corresponding asset values in 1934, write-downs of property and equipment were apparently of minor importance, slightly exceeding 10 per cent. However, even on a per annum basis they formed an appreciable amount compared with depreciation and net income. And their significance is even greater, since it is their cumulative effect on book values that is of importance, and this is more closely measured by the total for the decade.[6]

[6] The totals are not *exact* measures of the cumulative effects because depreciation and depletion charges may eventually wipe out the book value of the asset and thus render revaluations only of passing influence on book values. For intangibles and investments and such tangible property as land, however, the situation is otherwise.

Write-downs of intangibles almost equaled their final net book value. Of course, one reason for the large relative amount of write-downs of intangibles is that the book values used are those after revaluation, not before. But that the ratio would be large in any event is to be expected from the nature of the asset. No one can accurately measure the value of goodwill, patents or trademarks; consequently, all valuations are suspect and subject to correction, and as we shall see later, influenced by the prevailing state of business hopes. It is for this reason that intangibles are so often written down, or written off, or never allowed to appear in the balance sheet. Of the 208 corporations studied here only 60 valued their intangible assets (on their books) in 1934 at more than one dollar.

If we extend our analysis to the classification by year of incorporation the distinction between corporations in existence for the entire period 1925-34 and those coming into existence during the ten years appears rather significant. The companies incorporated prior to 1925 wrote off an appreciably larger portion of their property accounts than did those in existence only part of the decade studied. This is true, also, of investments. In writing down intangibles, however, the newer companies considerably exceeded the older concerns. With respect to write-ups of intangibles and of property the relative positions are reversed.

The revaluations made by corporations in existence during the entire decade may be examined in greater detail (Table 3).[7] The most highly concentrated distributions

TABLE 2

TOTAL WRITE-UPS AND WRITE-DOWNS, 1925-1934, IN RELATION TO NET BOOK VALUES OF CORRESPONDING ASSETS IN 1934

PERIOD DURING WHICH INCORPORATED	NUMBER OF CORPORATIONS	AGGREGATE WRITE-UPS	AGGREGATE WRITE-DOWNS	NET BOOK VALUE OF ASSETS (1934)	AGGREGATE WRITE-UPS	AGGREGATE WRITE-DOWNS
		(in thousands of dollars)			*(as percentages of net book value of assets)*	
		PROPERTY, PLANT AND EQUIPMENT				
Before 1925	153	86,131	567,060	4,907,614	1.76	11.55
1925-1934	55	90,754	102,092	1,504,039	6.03	6.79
Total	208	176,885	669,152	6,411,653	2.76	10.44
		INTANGIBLES				
Before 1925	153	52,587	254,837	308,309	17.06	82.66
1925-1934	55	890	53,515	21,260	4.19	251.72
Total	208	53,477	308,352	329,569	16.23	93.56
		INVESTMENTS				
Before 1925	153	202,293	165,521	943,599	21.44	17.54
1925-1934	55	17,823	31,349	249,292	7.15	12.58
Total	208	220,116	196,870	1,192,891	18.45	16.50

TABLE 3

WRITE-UPS AND WRITE-DOWNS, 1925-34, AS PERCENTAGES OF THE NET BOOK VALUES OF THE CORRESPONDING ASSETS IN 1934

Frequency distribution by size of percentage

Each corporation counts as one item[1]

Percentage[2]	PROPERTY, PLANT AND EQUIPMENT			INTANGIBLE ASSETS			INVESTMENTS		
	Write-up	Write-down	Net Write-up	Write-up	Write-down	Net Write-up	Write-up	Write-down	Net Write-up
∞[3]				2		1	2		
140.0 and over	1						7		4
130.0 to 139.9									
120.0 to 129.9	1								
110.0 to 119.9	1								
100.0 to 109.9									
90.0 to 99.9							1		1
80.0 to 89.9									
70.0 to 79.9									
60.0 to 69.9	1			1					
50.0 to 59.9	1		2				1		1
40.0 to 49.9	3		2				2		
30.0 to 39.9	1		2			1	1		2
20.0 to 29.9	3		1				2		2
10.0 to 19.9							2		
0.1 to 9.9	20		7				6		
0.0	121	79	73	150	98	98	129	99	95
—0.1 to —9.9		20	17		2	2		8	6
—10.0 to —19.9		9	8		1	1		4	4
—20.0 to —29.9		5	5		1	1		2	2
—30.0 to —39.9		8	9		1			5	6
—40.0 to —49.9		2	1					3	3
—50.0 to —59.9		1	2					1	1
—60.0 to —69.9		4	2		1	1		1	1
—70.0 to —79.9		8	7					2	
—80.0 to —89.9		2	2		1	1		3	5
—90.0 to —99.9		2	2					3	
—100.0 to —109.9		1	1						
—110.0 to —119.9		1	1					1	1
—120.0 to —129.9					1	1		2	2
—130.0 to —139.9								1	1
—140.0 and under		11	9		9	9		12	11
—∞[3]					38	37		6	5
Total	153	153	153	153	153	153	153	153	153

[1] Only corporations in existence during the entire period are included.

[2] The classes '140.0 and over' and '—140.0 and under' do not include the items of infinite size.

[3] Infinite: denominator is zero.

are those for revaluations of property, plant and equipment. A definite and thick clustering about the zero point is noticeable. This means that the amount of write-up or write-down of property, plant and equipment is rather small for most companies; that, relatively speaking, there were only a few large write-ups or write-downs of this asset. Revaluations of investments were also small for most companies but there were large amounts of write-ups and write-downs for more companies than in the case of property, plant and equipment. That is, the frequencies decrease less rapidly as the zero point is left behind. For intangibles the distribution is quite strange. Of the 55 reporting write-downs, 38 had completely written down their intangible assets.[8] It is therefore to be expected that

[7] The younger companies are omitted to avoid the possible lack of comparability that may arise from their absence during part of the period 1925-34.

[8] A qualification must be applied to the zero class in the above distributions. It will be remembered that a majority of the companies in the sample show no value of intangible assets at all.

revaluation of intangibles will tend, more than revaluations of other assets, to introduce divergencies in rates of profits, by affecting book values of net worth.

REVALUATIONS BY YEARS

The distribution of number and amount of revaluations among the years covered in our survey concerns us next (Tables 4 and 5).

Write-ups of property, plant and equipment reached a peak, in respect of number, in 1928. In 1932 and 1933 there were none. A roughly similar time pattern is found in the upward revaluations of intangible assets, though the total number involved is too small to provide much evidence. With respect to investments, write-ups fluctuated much less; consequently the turning points are less definitely established.

The effects of the most recent depression are reflected sharply in the number of write-downs of property and investments. The number of downward revaluations of tangible fixed assets fell slowly to 1928-29 and then shot up, reaching a high in 1932. Similar fluctuations are apparent for investments except that the rise to 1932 is more rapid (in percentage terms). No reliable indications of a decline between 1925 and 1928 are available. Write-downs did not decline between 1933 and 1934, as in property, plant and equipment. The number of write-downs of intangibles did not increase appreciably between 1928 and 1932. The distribution in time is similar in some respects to that of investment write-ups. The small rise in 1932 and the relatively large number as early as 1925 lend support to the belief that intangibles are written down when business is good, to indicate caution, as frequently as they are written down when times are bad and values appear to be tottering or to have crashed.

The data on the number of revaluations may be supplemented by those on the amount. The two sets of data are of interest from different points of view, and in conjunction throw light on the changing magnitude of revaluations per company, as well as per year. From the viewpoint of economic behavior those on number are most useful, indicating more clearly the reactions of business men as reflected by changes in their accounting habits. The amount of revaluations in each year is useful in interpreting aggregate book values of assets and capital.

In the main, the material bearing on the amount of revaluations confirms the evidence gained from the number of companies involved. There are some discrepancies in high and low points: in 1926 write-downs of property account were larger than in 1928; the fewest occurred in 1930. Of the write-downs of tangible fixed assets 44 per cent were made in the one year 1932 and 18 per cent in 1931. During the four years 1931-34, 84 per cent of the aggregate write-downs of the decade occurred.

Footnote 8 concluded

Therefore a large number of companies with intangible assets valued at zero, and with no revaluations of intangibles, should be placed in a separate (indeterminate) class, since $0 \div 0$ is mathematically indeterminate. These, however, have been placed in the zero class.

TABLE 4

CORPORATIONS REPORTING REVALUATIONS OF FIXED ASSETS, 1925-1934, NUMBER, BY YEARS

CORPORATIONS INCORPORATED BEFORE 1925	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*
Write-ups										
Property, plant and equipment	4	4	7	13	7	4	3	....	....	1
Intangibles	....	....	....	2	1	1	....	....	....	....
Investments	4	4	3	2	3	2	1	3	3	7
Write-downs										
Property, plant and equipment	9	8	7	6	6	8	24	30	22	13
Intangibles	11	8	7	10	7	4	10	11	5	6
Investments	2	1	1	2	5	7	15	23	13	13
Total number of corporations	153	153	153	153	153	153	153	153	153	153
ALL CORPORATIONS IN SAMPLE										
Write-ups										
Property, plant and equipment	6	9	11	18	10	5	6	1	1	3
Intangibles	....	....	1	2	1	1	1	1	....	....
Investments	4	5	4	3	3	3	2	3	5	11
Write-downs										
Property, plant and equipment	10	9	8	7	9	11	30	41	33	19
Intangibles	13	10	11	14	12	6	11	12	9	6
Investments	3	1	3	4	8	10	20	31	18	18
Total number of corporations	159	172	181	192	199	201	202	207	208	208

TABLE 5

WRITE-UPS AND WRITE-DOWNS, 1925-1934, AMOUNT, BY YEARS

Reported by corporations in existence during the entire period[1]

(thousands of dollars)

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*
Write-ups										
Property, plant and equipment	10,254	6,614	15,980	24,086	11,426	12,315	5,343	.....	.....	77
Intangibles	.....	.....	.....	16,442	25,559	10,586	.....	.....	.....	.....
Investments	17,938	33,140	7,046	6,155	24,967	3,762	49	417	1,057	8,517
Write-downs										
Property, plant and equipment	12,495	24,008	10,471	21,474	10,171	7,630	96,698	236,263	60,984	59,730
Intangibles	48,370	7,918	14,308	49,514	29,191	13,801	11,776	42,000	10,193	11,653
Investments	158	25	582	4,779	13,579	2,975	29,404	39,745	35,342	37,081
Net write-ups										
Property, plant and equipment	—2,241	—17,394	5,509	2,612	1,255	4,685	—91,355	—236,263	—60,984	—59,653
Intangibles	—48,370	—7,918	—14,308	—33,072	—3,632	—3,215	—11,776	—42,000	—10,193	—11,653
Investments	17,780	33,115	6,464	1,376	11,388	787	—29,355	—39,328	—34,285	—28,564

[1] The sum of the figures on any line does not exactly equal the corresponding aggregate in Table 2 since the latter includes some revaluations not allocated to any specific year of the period 1925-34.

The net difference between write-ups and write-downs reveals interesting features. In no year is there a net write-up of intangibles. The cyclical movements in the other two series are sharp and reflect the state of general business on the one hand and the stock market on the other.

The increase in amount of write-downs per company, of tangible fixed assets, between 1929 and 1932, is sharp. While number of write-downs rose from 6 to 30, or five-fold, the amount in dollars rose from 10 million to 236 million, or over twenty-three-fold. In investments, however, no such clear relationship and divergence is evident in the two series of number and amount.

The diverse behavior of the three classes of fixed assets reflects the factors affecting the amount and number of revaluations. To these factors we now turn.

REASONS OFFERED FOR REVALUATIONS

We have been concerned with describing the fixed assets most commonly affected by revaluations, the relative number of concerns involved and the amount of revaluations made by them, and the distribution of number and amount over the decade studied. What are the reasons offered in explanation of these various revaluations?

The type of assets involved and the relative amounts of revaluations reported for each, and their time distribution in relation to what we know of the corresponding state of business, in themselves throw light on these reasons. But there is more direct information provided in many of the original reports. Let us examine this material first.

Discrepancy between book value and some sort of 'current value' is the basis of practically all revaluations. In most of the reports that included some explanation of the entries recorded the only statement was simply to the effect that an appraisal had been made of property, plant and equipment. Some 40 of the companies reporting write-ups and write-downs of property offer this explanation. In a sense, of course, any revaluation implies an appraisal as of a given moment. But as used here, and as understood in accounting reports, the term 'appraisal' is confined to a rather detailed inspection of physical condition together with a study of obsolescence and current reproduction costs. Not always are these appraisals reported as 'independent'—that is, made by outside experts. Some companies state that their assets were revalued simply on the basis of opinions or decisions of officers or directors.

Appraisals are usually made because a decision to revalue has already been more or less definitely formed. To this extent the opinions of officers and directors underlie every appraisal and therefore every revaluation based upon an appraisal. Necessarily these opinions and decisions also underlie every retention of existing book values.

Some companies appear to be in the habit of using expert appraisals as aids in their accounting. Thus, the F. E. Myers & Bro. Co. reports appraisals on three separate occasions, 1922, 1927 and 1933, all resulting in revaluations.

Even an independent appraisal is still subject to the superior will and responsibility of the officers and directors of a corporation. Occasionally, appraisal does not lead to immediate or ultimate revaluation, or the appraisal may be modified by decision of the directors. For example, the F. E. Myers & Bro. Co. entered one appraisal only partly at the time it was made. The balance was, however, recorded at a later date. A 1920 appraisal of the assets of Bucyrus-Erie was not written into the books until 1925. A curious appraisal of an appraisal was made when "ap-

praised sound values" of the property of General Cable were discounted 20 per cent and only then entered in the records.

Appraisals, of course, are not reasons for revaluations but only methods of getting at the amounts by which to revalue. They can tell us nothing in themselves of these reasons except to suggest that the fundamental factors were sufficiently strong to be sensed by the officials ordering the appraisals.

More explicit as to the kind of 'value' substituted for the superseded book value are those explanations mentioning anticipations of losses on disposal of property. These are reported by several corporations. One, George A. Fuller Company, anticipated and recorded a gain. But even this explanation tells us little as to the basic causes.

More fundamental are such factors as changes in general price levels, discovered obsolescence, and errors in earlier estimates of depreciation and depletion. Price changes are mentioned specifically by some ten corporations as the cause of the revaluations made by them. In one or two instances (e.g., Mohawk Carpet) mention is made of "current reproductive costs new" as the revised basis of book values. Changing current prices had a continuous effect on the book values of depletable assets of one subsidiary of the American Smelting and Refining Company. This company valued the "known and probable" ore in its mineral lands on the basis of the average price of metals received by it the preceding ten years. As a result, revaluations were upward in 1927, 1928 and 1929, and downward in each of the five years following. Part of these revaluations represented, of course, some allowance for depletion and made it unnecessary to compute depletion separately, since even if prices remained constant, the changing amount of ore in the mineral lands would result in a downward revaluation.

Obsolescence is mentioned specifically in only a few reports. As we shall see later, however, it is probably a major factor accounting for downward revaluations.

Revised estimates of earlier charges for depreciation and depletion are responsible for a considerable number of revaluations of property account. About a dozen reports mention this. Most of these refer to decisions of the Treasury Department in connection with the assessment of income taxes. In one or two the depreciation or depletion base also was adjusted.

Broader changes in the methods of accounting for fixed assets, as well as in the application of methods already in use, are responsible for certain revaluations. For example, development of mines and oil wells, formerly charged to income, are now often capitalized and written off periodically through depreciation charges. A change of this sort requires that the value of developments already charged to income but still rendering service be added to fixed assets. A few instances of this sort were discovered, including the Standard Oil Company of Kansas. This change of policy was rather wide-spread after the beginning of the recent severe depression.

Other instances of changes in accounting policy occur in the case of patents (The Paraffine Cos., Inc.), improvements (South American Gold and Platinum), and lease rentals (Standard Oil of Kansas).

The idleness of certain portions of plant is given as grounds for write-down of values by ten or twelve corporations. Naturally, it is more or less permanent idleness that is anticipated. The anticipation of permanent disuse may reflect only the pessimistic mood inherent in a long and severe depression, and the concomitant conservatism it engenders. Where actually permanent this idleness is, to some extent, a consequence of obsolescence, and to some extent a result of over-investment in the preceding period of prosperity. When only temporary, write-downs arising from disuse of property may be expected to be cancelled later when fears are not realized. This is true in several instances (e.g., Gotham Silk Hose). At least one company (General Motors), however, counterbalanced restorations of the value of formerly idle property by contra entries to reserves for depreciation.

This cancelling of earlier revaluations by further revaluations is not restricted to entries arising from idle facilities. On the contrary, a considerable number, especially of write-downs during the last few years, represent cancellations of write-ups at earlier dates. Such cancellations are reported, in our sample, by as many as thirty companies. In one or two it is a revaluation by a predecessor company that is eliminated. Some of these revaluations follow one another in a rather striking manner (Byron Jackson Company, Ludlum Steel). One company (Superior Oil) reports a write-down during receivership (1931) of a former recording (1929) of an "excess appraisal value". This practice of a mutual cancelling of write-ups and write-downs is indicated by Table 6 relating to the property account. A distinct correlation is apparent although it is not high. Of the 31 companies reporting write-ups 21 (or two-thirds) reported write-downs also. But only 74 of the

TABLE 6

RELATIONSHIP OF WRITE-UPS AND WRITE-DOWNS OF PROPERTY, PLANT AND EQUIPMENT

NUMBER OF COMPANIES[1]	REPORTING WRITE-DOWNS	REPORTING NO WRITE-DOWNS	TOTAL NUMBER
Reporting write-ups	21	10	31
Reporting no write-ups	53	69	122
Total number	74	79	153

[1] Only corporations in existence during each year 1925-34 are included.

total 153 (or less than one-half) reported write-downs. If the latter ratio had applied also to the group of companies reporting write-ups, we would have expected to find only 15 reporting write-downs, instead of the 21 actually doing so.[9]

The almost universal streak of caution in business men, found side by side with receptivity to current moods, underlies many of the entries discussed above. The presence of write-downs when facilities are idle or when loss on disposal is anticipated, and the many absences of write-ups, reflect such caution. It is particularly clear, however, in the treatment of intangible fixed assets—patents, goodwill, trade-marks.

Intangible assets are reported, as already mentioned, by only 60 of the 208 companies in our sample. Many companies wrote off intangible assets as soon as they were acquired by purchase from other concerns (Borden, Devoe and Reynolds, Dupont, etc.). In other companies, when tangible fixed assets were written up, the surplus thus created was used to extinguish intangibles (Continental Can, City Ice & Fuel, Sharon Steel Hoop, Addressograph-Multigraph). When acquired for value paid, of course, adequate justification has appeared for placing intangibles upon the books.

With respect to investments, most revaluations appear to be the result of changes in market values. Differences between cost and value on the books of the issuing company also have often been eliminated in the form of a write-down. (Occasionally such differences are recorded as intangible assets.) Rather often, investments are kept on the books on a lower of cost or market basis, which may mean write-downs in a falling market, and restoration of the cost basis in a rising market. Book values of investments are also affected by the financial condition and prospects of the companies, especially subsidiaries, whose securities are being held. To some extent investments in foreign subsidiaries have been revalued as foreign exchange rates have fluctuated (National Cash Register).

So much for the explanations given in the reports; further information is provided by the figures themselves. The distribution of revaluations among the various assets, especially the proportionately large volume of write-downs of intangibles, and the response in number and amount of revaluations to the conditions prevailing during the recent severe depression further emphasize the nature of the forces making for revaluation of assets. The strange compound of conservatism and optimism, major changes in price levels, changes in accounting practice (changes that are themselves reflections of current business conditions), obsolescence uncovered in a severe depression—these are the factors and conditions affecting valuations on the books of business enterprises.

These bits of evidence may be supplemented by other data collected, through direct questionnaires, by the National Association of Cost Accountants.[10] Members of the association were asked, early in 1933, whether asset values should be written down. Of 117 cost accountants replying, 85 were in favor of writing down assets. Of these, 13 favored "present market value", 64 favored "net sound value", and 9 some other value. Only 13 were ready to accept "present market value", 64 advocating a net sound value which must have meant, to them, some value greater than "present" market value, probably being more in line with their estimates of future market values. The complete record is as follows:

Number of members replying to questionnaire		117
Those against writing down assets		32
Those in favor of writing down assets		85
To present market value	13	
To net sound value	64	
To some other value	9	
Number of companies in which assets have not been written down		71
Number of companies in which assets have been marked down		46
Number of companies marking down		
Assets now or expected to be in use	35	
Assets not now or expected to be in use	33	
Assets in both groups	22	
Number of members in favor of marking down assets whose companies have not written down their assets		42

It is difficult to determine just which factors made such a large number of the cost accountants favor the writing down of assets. "Present market value" implies, although not necessarily, that the collapse of prices was most influential. But even if we assume this, it must be remembered that 73 other accountants favored other values. It is probably not unfair to conclude that besides the fall in prices the existence of unused capacity was also a powerful force. Indeed, in the report of the St. Louis Chapter of the Association, the entire discussion of revaluation is related primarily to the existence of idle facilities. The fact that of 46 companies 33 wrote down idle plant, 11 writing down only idle plant, adds weight to the conclusion that obsolescence, unwise expansion, and the mood of depression were important elements.

We have reviewed some of the reasons offered for the revaluations made in the years covered by our survey.

[9] The significance of the difference between 15 and 21 may be demonstrated by technical statistical means.

[10] *N.A.C.A. Bulletin, Section I,* March 15, 1933, p. 1037; and "Idle Plant Facilities, Excess Plant Values", Report of National Association of Cost Accountants Conference (St. Louis Chapter), April 6, 1933 (mimeographed).

One of the features of the reports is the small place specifically accorded to such factors as faulty investment and obsolescence (assuming that these really can be distinguished). But it is probably in the nature of the records that they do not reveal the really fundamental factors.[11] Over-investment during prosperity, and changes in tastes and technique that lead to obsolescence, find their concrete expression in the form of idle property—unused plant—in depression. It is this concrete expression that is noted in the records as the immediate cause of write-down.

Obsolescence appears in depression more often than in prosperity since at the latter time most capacity is in full use. The apparently temporary write-downs in severe depression are often really permanent write-downs, not merely a reflection of the moment's mood. But obsolescence is revealed also to some extent even in prosperity. It may be doubted, therefore, whether in the near future write-ups will exceed write-downs, as a consequence of the restoration, even if partial, of earlier (1929) price levels. It is probable that write-downs always tend to exceed write-ups, except possibly during or immediately after a tremendous inflation, and that this excess is a reflection of the obsolescence not accounted for in depreciation charges.

One further question arises, namely, why so many companies do not revalue their assets. As we have seen (Table 3), of 153 corporations, 79 did not write down their property, plant and equipment during the decade studied, although this period included one of the severest and longest depressions on record. Since no explanations are given, obviously only an opinion can be hazarded as to the reasons. Among these, first place must be given to the weight of accounting usage. The accounting apparatus grips most firmly those figures that are based on original cost, figures that are as comfortable as old friends and as unchanging, tried as they are by the acid test of the paid voucher. Other reasons are also related to accounting practices; for example, the regulations of the Treasury Department which refuses to accept revaluations for tax purposes. The legal theory of the inviolability of corporate capital, confused though it be, may also exercise some influence.

[11] It thus becomes necessary, if a conclusive statement is to be made about the basic factors, to approach the problem from another angle by utilizing materials not given in the reports. This *Bulletin* presents some preliminary results derived from only one body of data.

The whole problem of revaluation is part of the broader problem of the factors making for profits and losses. A detailed study of the fortunes of individual industries and enterprises, with reference to changes in demand, technology, supply prices of competing and joint factors of production, the state of competition, and legislative enactments, is required to get at a full explanation of the basic factors underlying revaluations.

Revaluations may not be made simply because of a refusal to recognize current conditions as anything but temporary. Such optimism (or pessimism) may persist even in the face of a fairly long period of depression or prosperity; it is not always misplaced in so far as the ordinary business cycle is concerned.

Finally, it may be considered undesirable to revalue assets in order to avoid certain effects upon calculations of profits or book capital, and upon those who use these records—investors, bankers and stockholders. Or if these effects be felt desirable it may be considered unnecessary to go to the trouble of revaluation in order to attain them. This brings us to the question of the effects of revaluations, which are two-fold: they influence measures of both capital and income.

EFFECTS OF REVALUATIONS

The effect on measures of fixed assets, particularly property, plant and equipment, is illustrated by certain figures collected from published reports by Arthur H. Winakor (Table 7). The individual industries given are those in which the effect of write-ups and write-downs seemed especially large. The greatest difference between book value and book value adjusted for revaluations occurs in the apparel industry, where it amounts to over 30 per cent of the latter figure. The property account of all industries combined was affected by revaluations to the extent of 8 per cent. But not only the aggregate of the assets, and the measures of total national wealth in which they are included, are subject to the influence of revaluations. Industrial comparisons and comparisons of individual companies are affected even more strongly.

TABLE 7

CHANGES IN NET BOOK VALUE OF PROPERTY, PLANT AND EQUIPMENT, INDUSTRIAL CORPORATIONS[1]

INDUSTRY	NET BOOK VALUE IN 1932 AS A PERCENTAGE OF THE 1927 VALUE	
	Ignoring revaluations of assets	Correcting for revaluations of assets
Total	104	113
Selected industries		
Apparel	67	97
Aviation and auto accessories	101	123
Chemicals	123	142
Machinery and tools	92	100
Petroleum	104	119

[1] Arthur H. Winakor, "Maintenance of Working Capital of Industrial Corporations by Conversion of Fixed Assets", University of Illinois, January 23, 1934, pp. 25-6. The total number of companies covered is 182.

Revaluations affect, also, estimates of certain current costs—depreciation and depletion—and therefore estimates

of profits. They need not do so, of course. Appreciation may be written off by charging depreciation on the appreciated portion not to current income account but to surplus. There are several instances of this practice in the corporate reports examined here (e.g., Evans Products). Depreciation may continue to be charged on written-off property (that has been restored to use) and added to costs, the corresponding credit being to some surplus account (Snider Packing). Or, as one cost accountant suggested, write-down may be accomplished by setting up a reserve for property revaluation, allowing the assets to be carried at cost in the books for depreciation purposes and at present replacement value on the balance sheet.[12] Further, as already mentioned, there are the restrictions of the income tax laws which do not permit revaluations to affect the amount of depreciation charges deducted in computing taxable net income. But on the whole, the ordinary records of business depreciation and depletion are definitely affected. Indeed, actual revaluation is not necessary for this result to be accomplished. Recognition of the factors involved, leading to a change in depreciation rates, or to charging to accounts other than cost of sales the burden resulting from idle facilities, accomplishes much the same result.[13]

The effects on the computation of costs and profits are obvious. Indeed, an argument offered for writing off plant values is that it leaves the company in a "splendid competitive market position".[14] That is, its costs are lowered by the amount of depreciation on the values written off. The extent to which aggregate costs affect competitive position is, of course, a problem in itself. But in any event, the computed profits are definitely affected. With them are affected the available measures of corporate savings and of national income.

Measurement of the *rate* of profits is influenced by revaluations in two ways. The numerator, net income, is

[12] St. Louis Chapter of the N.A.C.A., *op. cit.*, p. 13.

[13] See the interesting answers to questions bearing on these points in the report of the N.A.C.A. Conference (St. Louis Chapter), already cited.

[14] Cf. W. A. Layman, *The Annalist*, August 25, 1933.

TABLE 8

TOTAL REVALUATIONS OF FIXED ASSETS, 1925-1934, AS PERCENTAGES OF THE NET BOOK VALUES OF TOTAL ASSETS IN 1934

Frequency distribution by size of percentage

Each corporation counts as one item[1]

Percentage	WRITE-UP Number	WRITE-UP Percentage	WRITE-DOWN Number	WRITE-DOWN Percentage	NET WRITE-UP Number	NET WRITE-UP Percentage
70.0 and over	1	.7				
60.0 to 69.9	2	1.3			1	.7
50.0 to 59.9	1	.7				
40.0 to 49.9	1	.7				
30.0 to 39.9	4	2.6			1	.7
20.0 to 29.9	3	2.0			3	2.0
10.0 to 19.9	6	3.9			3	2.0
0.1 to 9.9	34	22.2			7	4.6
0.0	101	66.0	42	27.5	40	26.2
—0.1 to —9.9			44	28.8	39	25.5
—10.0 to —19.9			15	9.8	13	8.5
—20.0 to —29.9			10	6.5	9	5.9
—30.0 to —39.9			10	6.5	11	7.2
—40.0 to —49.9			7	4.6	6	3.9
—50.0 to —59.9			3	2.0	2	1.3
—60.0 to —69.9			7	4.6	4	2.6
—70.0 to —79.9			1	.7	1	.7
—80.0 to —89.9			1	.7	1	.7
—90.0 to —99.9			3	2.0	2	1.3
—100.0 to —109.9					2	1.3
—110.0 to —119.9			3	2.0	1	.7
—120.0 to —129.9						
—130.0 to —139.9						
—140.0 to —149.9			3	2.0	4	2.6
—150.0 and under			4	2.6	3	2.0
Total	153	100.0	153	100.0	153	100.0

[1] Only corporations in existence during the entire period are included.

affected, and the denominator, net worth, as well. But while both change in the same direction the extent of the change is different. Some light is thrown on the possible effects of revaluations on measures of corporate net worth by the figures collected in our study. Table 8 suggests the influence of total write-ups and write-downs on total assets (which include, besides fixed assets, cash, inventories and accounts receivable). Most write-ups of fixed assets during 1925-34 were small, only 18 companies (12 per cent of the total number) reporting upward revaluations exceeding 10 per cent of total assets at the end of 1934. Write-downs exceeding 10 per cent of total assets were much more frequent. As many as 67 concerns wrote down fixed assets by more than 10 per cent, 42 writing down over 30 per cent of 1934 total assets. The net figure, write-ups less write-downs, was also large for many corporations. About 5 per cent of the companies reported net upward revaluations exceeding 10 per cent of total assets, while almost 40 per cent reported net write-downs of more than 10 per cent of all assets. Of these, 20 companies, or over 13 per cent of the total, revealed net write-downs during the decade exceeding half of their total assets in 1934. The ratio of net worth to total assets is roughly 0.75. The effects on net worth, therefore, are understated by the figures in the table.

Because of revaluations, comparisons of profitability must be made with full recognition of the complicating features of book values. Their importance, especially to stockholders and prospective investors, is attested by the fact that our basic data originate in an attempt, by the Securities and Exchange Commission, to supply these groups with the necessary information.

SPECIAL NOTE TO BULLETIN SUBSCRIBERS

MAY we call your attention to the new class of members, Associates, announced in the attached leaflet. If subscribers whose subscriptions expire with this issue will send $5 instead of $1 they will continue to receive the *Bulletin* and in addition will be entitled to a 33 1/3 discount on all National Bureau books.

Frederick C. Mills' *Prices in Recession and Recovery* will be released on December 14 (581 pp., 60 tables, 16 charts, $4.00). The Table of Contents is given on the enclosed leaflet.

The fifth issue of the 1936 series of *Bulletins* will be by Leo Wolman, 'The Recovery in Wages and Employment'.

The 1937 series will start with two issues on agriculture: the first will discuss the wheat crisis and show its peculiar relation to mechanization, size of farm, and other elements affecting supply; the second will consider the demand side and its importance in such agricultural fields as cotton and dairying.

Another issue will be by Simon Kuznets on National Income, 1919-1935.

PRICES in RECESSION and RECOVERY

A Survey of Recent Changes

FREDERICK C. MILLS

National Bureau of Economic Research, Inc.

1819 Broadway New York, N. Y.

National Bureau
of Economic Research

BULLETIN 63

DECEMBER 21, 1936

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

The Recovery in Wages and Employment

Copyright 1936, National Bureau of Economic Research, Inc.

LEO WOLMAN

THE recovery in wages and employment, which for most groups began in the middle of 1933, has now continued more than three years. In its latest report, issued in October 1936, the United States Department of Labor estimates that the total number of employees, exclusive of those in agriculture, has increased six million since March 1933. In this rise all groups have shared, but in general the greatest increases have been in the most severely depressed industries.

Almost without exception, payrolls have increased more rapidly than employment. This is due to the very considerable rise in rates of wages since 1933 and to the shift from short- to full-time employment. The greatest percentage increases in aggregate wage payments, as in employment, were in industries most severely hit by the depression.

Both employment and payrolls in all major categories of industry remain substantially below 1929, or the average of 1923-25. In manufacturing, during the first nine months of 1936, employment was 14.1 per cent below 1929, 10.1 per cent below 1923-25; payrolls were 27.5 per cent below 1929, 20.9 per cent below 1923-25. The average number of manufacturing employees in the first nine months of 1936 is estimated to be 7,529,000, against 8,767,000 in 1929. Average weekly payrolls in manufacturing in 1936 and 1929 are estimated as approximately 161 and 222 million dollars respectively. Employment and payrolls in manufacturing industry during 1936 appear to have returned to the levels prevailing in October and November 1930.

The lag in recovery, as measured by changes in employment and payrolls, is greatest in the capital goods and construction industries, and in industries suffering from protracted depression, like anthracite coal mining. The gulf between 1929 and 1936 is widest in these industries in spite of the very considerable advances made by them since 1933.

Weekly wages per employee have increased substantially since the turn in business in 1933. But they likewise remain far below 1929, mainly because of the general reduction in the work-week effected under the N.R.A. codes. Where the hours of work were not reduced under the N.R.A., the disparity between wages per week in 1936 and 1929 is not so great.

Increases in payrolls and in per capita wages during the recovery have exceeded the rise in the cost of living. According to official indexes, living costs in 1936 are still about 18 per cent below 1929. The gap between real wages is, therefore, much smaller than the gap between money wages from 1929 to 1936.

A series of decisions by the United States Supreme Court, beginning on May 27, 1935, the date of the Schechter decision, has brought to an end much of the governmental regulation of wages and hours undertaken by the N.R.A. and other federal agencies and by state governments. The limitations on the power of the federal government imposed by the decisions of the Court in this case and in the Guffey-Snyder case on May 18, 1936, and the restrictions on the authority of state governments to regulate wages indicated in the decision of the Court, June 1, 1936, relating to the constitutionality of the minimum wage act of New York State, have removed the formal regulations affecting wages and hours that had been applied for two years to the major classes of industry in this country. However, average wages and hours of work in the major groups of industries affected by these rulings do not appear to reflect the removal of control and the restoration of freer competitive conditions. There is some evidence that the reductions in wages and increases in the schedules of hours that probably took place in some industries and plants were offset by wage increases and lower schedules of hours in others.

The statistics of wages and employment used in this *Bulletin* are taken from reports of the United States government, except the series of hourly earnings and average

hours worked per week in manufacturing industries, 1929-36. Since official statistics for these series for years prior to 1932 are not available, we have used figures published by the National Industrial Conference Board. All are subject to margins of error of indeterminate amount. The older series seem on the whole to be more reliable than the more recent. Current indexes of employment and payrolls are probably least trustworthy for classes—such as construction, services and trade—for which the available data are still incomplete and the samples therefore not sufficiently representative. The results of the Census of Business of 1935 should supply some of the material needed to correct current monthly indexes of employment and payrolls in these classes. The preliminary report of the 1935

TABLE 1

INDEX NUMBERS OF EMPLOYMENT AND PAYROLLS, MANUFACTURING AND NON-MANUFACTURING INDUSTRIES, 1933-1936

(*1929=100*)

	EMPLOYMENT				PAYROLLS			
INDUSTRY	*1933*	*1934*	*1935*	*1936*[1]	*1933*	*1934*	*1935*	*1936*[1]
All manufacturing industries[2]	68.8	78.7	82.0	85.9	45.3	57.6	65.3	72.5
Selected manufacturing industries								
Cotton goods	89.3	94.8	91.2	94.5	66.7	78.4	79.6	85.5
Blast furnaces, steel works, rolling mills	68.9	82.1	86.8	96.8	37.0	51.4	64.8	82.7
Steam railroad repair shops	59.9	64.4	62.1	69.4	43.7	50.9	53.6	63.7
Foundry and machine shop products	49.0	63.3	69.3	79.4	29.7	44.9	53.9	68.2
Automobiles	54.4	84.8	99.1	99.0	34.4	61.3	80.4	85.9
Boots and shoes	92.8	96.2	95.2	94.3	63.9	74.5	73.6	70.9
Knit goods	91.0	95.8	100.1	101.7	62.7	75.9	83.3	83.9
Lumber, sawmills	45.2	52.6	54.3	58.4	26.8	35.8	40.5	48.9
Baking	90.8	101.6	100.7	102.9	71.6	82.7	83.9	89.8
Women's clothing	85.2	89.9	94.4	99.2	52.2	65.2	70.6	71.9
Men's clothing	92.8	97.1	105.1	108.1	57.3	70.1	85.6	87.3
Extractive industries								
Coal mining								
Anthracite	51.7	59.6	53.2	51.8	45.8	55.9	47.5	44.9
Bituminous	67.9	77.2	76.7	77.8	37.8	54.2	58.2	67.2
Other mining								
Metalliferous	34.6	41.6	47.3	59.1	20.6	26.7	33.9	46.1
Non-metallic and quarrying	44.9	48.9	46.0	48.5	24.7	29.6	30.7	37.5
Crude petroleum producing	62.2	77.7	74.9	72.8	44.1	56.9	57.9	58.0
Public utilities								
Telephone and telegraph	70.4	70.3	70.1	71.7	68.2	71.5	74.5	77.7
Electric light and power and gas	78.8	83.8	84.8	89.4	72.0	77.9	81.4	87.4
Electric railroads and motor buses	70.0	72.1	71.2	71.7	58.9	62.2	63.7	66.6
Trade								
Wholesale	76.1	82.8	84.0	85.6	56.8	63.0	65.6	68.4
Retail	76.1	82.1	82.3	83.3	55.2	60.9	62.1	64.5
Service industries								
Laundries	78.8	81.3	81.5	85.6	59.5	64.9	66.9	73.4
Dyeing and cleaning	74.3	77.1	77.5	81.0	49.5	56.1	57.9	61.8
Hotels	70.1	80.2	81.0	83.2	51.0	61.6	63.4	66.2
Class I railroads	58.3	60.6	59.7	63.2[3]	47.9	52.0	56.3	62.4[3]
Building construction (private)	31.9	35.1	39.0	45.7	20.0	23.2	32.0	40.2

SOURCES: U. S. Bureau of Labor Statistics, except for Class I railroads and construction. The railroad statistics are based on data published by the Interstate Commerce Commission. The building construction statistics for 1933-35 are based on data collected by the U. S. Department of Commerce for its study of national income; the indexes for 1936 are extrapolations based on percentage changes in employment and payrolls in private building construction reported by the U. S. Bureau of Labor Statistics.

[1] Average of first 9 months only.

[2] The U. S. Bureau of Labor Statistics indexes for all manufacturing industries combined and for individual manufacturing industries have been adjusted to the trend shown by the 1933 Census of Manufactures.

[3] Average of first 8 months only.

Census of Retail Trade suggests that the corrections may well be considerable (see end of Section 1).

1. Employment and Payrolls

The course of employment and payrolls, 1933-36, is shown for major categories of industry in Table 1. All industries listed, except anthracite coal mining, show substantial and continuing increases in payrolls since 1933. Payrolls in metalliferous mining and private building construction have more than doubled. In the manufacturing, bituminous coal mining, and non-metallic mining and quarrying industries the increase is in excess of 50 per cent. In the production of crude petroleum and on the railroads payrolls have increased almost one-third; in the services more than one-fifth; and in trade and public utilities approximately one-sixth. The anthracite coal mining industry records no upturn at all, its payroll being lower in 1936 than in 1933; but the seasonal rise in production later in the year may improve the relative position of this industry.

In spite of the length of the period of recovery, now well in its fourth year, payrolls generally remain substantially under 1929. The best showing among non-manufacturing industries is made by the electric light and power and gas industry which is less than 15 per cent below 1929; the worst, by private building construction and non-metallic mining and quarrying whose total wage payments fall short of 1929 by 59.8 per cent in the one case and 62.5 per cent in the other. The payrolls of all manufacturing industries combined, the largest single source of employment and wage disbursements, are running more than one-quarter below 1929, but within the group there is a considerable diversity of experience. Thus among the eleven large manufacturing industries listed in Table 1, the payrolls of sawmills in 1936 were 51.1 per cent below 1929, and of baking establishments, only 10.2 per cent. Index numbers of employment and payrolls in selected industries for each month, 1929-36, are shown in Charts 1 and 2.

By and large the industries that were most depressed in 1933 have since had the greatest percentage increases in payrolls, and it was indeed to have been anticipated that index numbers of payrolls as low as 20 would on the rebound show the most striking relative improvement. But the figures at the same time show that where both the decline in payrolls and the subsequent recovery were greatest, the discrepancies between current wage disbursements and those in 1929 remain the widest. The payrolls illustrating this type of behavior are to be found mainly in the construction and construction materials industries and in the industries that produce capital equipment. Thus the industries of this class in which total wage payments are less than half those of 1929 are private building construction, mining other than coal, and many manufacturing industries producing capital equipment and construction materials (see

CHART 1
INDEX NUMBERS OF EMPLOYMENT, 1929-1936
1929=100

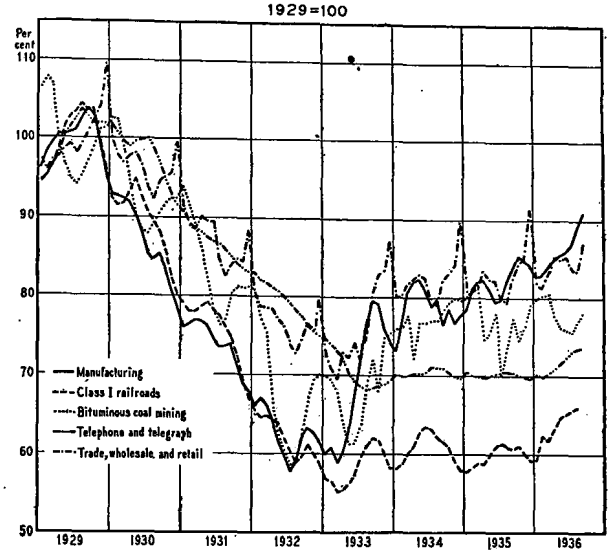


Table 3). Anthracite coal mining appears, also, to fall into this category, but the failure of employment and payrolls to recover in this industry probably reflects the continuance of a secular decline in its competitive position.

Through both depression and recovery there have been striking differences in the payroll and employment changes of industries manufacturing durable and non-durable goods, as shown in Table 2. In 1933 the industries producing durable goods were the more depressed, their payrolls being 65.6 per cent, and employment 45.1 per cent, below 1929. During the recovery their total wage payments doubled while payrolls in industries producing non-durable goods

CHART 2
INDEX NUMBERS OF PAYROLLS, 1929-1936
1929=100

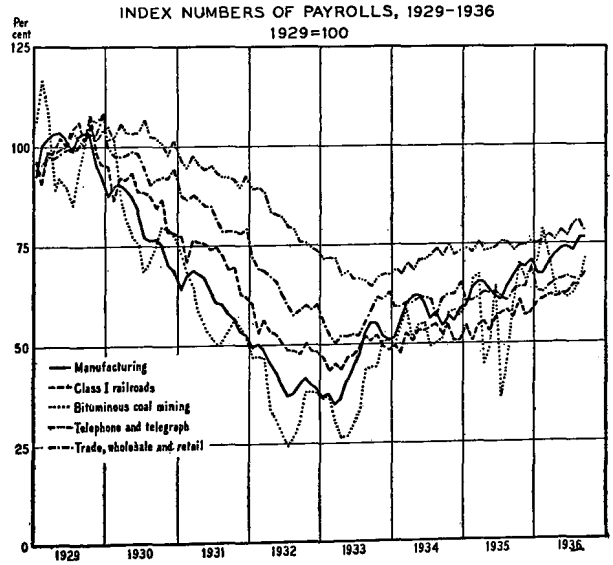


TABLE 2

INDEX NUMBERS OF EMPLOYMENT AND PAYROLLS IN INDUSTRIES MANUFACTURING DURABLE AND NON-DURABLE GOODS, 1933-1936

(*1929=100*)

	EMPLOYMENT				PAYROLLS			
	1933	*1934*	*1935*	*1936*[1]	*1933*	*1934*	*1935*	*1936*[1]
Durable goods	54.9	67.7	73.4	80.1	34.4	48.2	58.3	68.3
Non-durable goods	85.0	91.9	93.0	93.7	60.5	71.9	77.0	78.4

SOURCE: U. S. Bureau of Labor Statistics indexes adjusted by the National Bureau of Economic Research to the trend shown by the 1933 Census of Manufactures.

[1] Average of first 9 months only.

increased only 30 per cent. Most of the total rise in manufacturing employment and payrolls during 1936 was in the durable goods industries. But in many of the industries that produce construction materials and capital goods payrolls continue to be consistently lower than in industries producing perishable goods and other articles intended for the ultimate consumer.

It is clear from Table 3 that the most powerful obstacle in the path of more complete business revival has so far been the retarded rate of recovery of the construction materials and capital goods industries. Several of the large consumers' goods industries have raised their payrolls almost to pre-depression levels. In many of the industries related to construction, however, wage disbursements in 1936 are about half those in 1929. The limited list of capital equipment industries shows somewhat the same features; for the relatively large increase in the payrolls of the iron and steel industry reflects mainly the expansion in the production of automobiles and of a great variety of small steel products, and during 1936, the revival of demand for such heavier products as rails, plates and structural shapes. The demand for structural steel began to make itself felt in 1936, and is reflected in the rise of payrolls in blast furnaces, steel works and rolling mills in that year to a point 17.3 per cent below 1929. The continued low level of payrolls in the electrical manufacturing industry probably reflects the lag in the demand for heavy machinery and equipment from the electric light and power industry.

Fluctuations in payrolls have been closely paralleled since 1933 by changes in the volume of employment. But the recovery is in general much greater if measured by the increase in wage payments than in the number employed. In manufacturing, for example, payrolls increased, between 1933 and 1936, 60 per cent, employment only 25 per cent; in private building construction the increases were 100 per cent and 43 per cent, respectively; and in most other industries there were equally wide divergencies. Compared, also, to the recovery from the depression of 1921, the difference between increases in wage disbursements and in number employed appears to be much more striking in this latest revival of business.

Many factors doubtless have contributed to this condition, but the most influential have been the degree to which work-sharing was practiced during the latest depression and the very considerable rise in wage rates since the turn in business in 1933. While it has been customary in all depressions for industry to retain a more or less permanent labor-force and to distribute the available work among all its members, there is every evidence that in the latest depression the number of employees entirely laid off was relatively smaller and the extent of work-sharing among those retained relatively greater than previously. Under the circumstances, the recovery in business has manifested itself in a disproportionate rise in wage payments and a lag in reemployment. When the employees already on payrolls begin to work full time under prevailing schedules of hours, we may expect relatively greater increases in the number employed. It may well be that business in this country is now close to that stage of recovery. Consequently, barring a general increase in the length of the work-week, which now seems quite unlikely, or unusually rapid and great increases in the productivity of labor, the next phases of business revival may witness substantial increases in total employment.

Measured in terms of payrolls and employment the recovery has pursued an uneven course. The greatest percentage increases were recorded in the first months of recovery when business vigorously rebounded from the exceptionally low levels of activity to which it had descended during the period of bank failures and of the bank holiday in 1932-33. Consequently both payrolls and employment in 1934 were for most industries far in excess of 1933. In the second half of 1934 the rate of advance had begun to slacken and the percentage increases in employment and payrolls from 1934 to 1935 were much less than in the preceding year. The rate of increase in manufacturing pay rolls declined from 27.2 per cent, 1933-34, to 13.4 per cent, 1934-35; in bituminous coal mining from 43.4 to 7.4 per cent; in wholesale and retail trade from 9.7 to 3.1 per cent. In 1936, and for some industries in the second half of 1935, the rate of increase appears to have been again accelerated.

What the sequence in these stages of recovery has been

TABLE 3

INDEX NUMBERS OF PAYROLLS IN SELECTED MANUFACTURING INDUSTRIES, 1933-1936

(*1929=100*)

INDUSTRY	*1933*	*1934*	*1935*	*1936*[1]
Construction materials and allied products				
Lumber, sawmills	26.8	35.8	40.5	48.9
Lumber, millwork	22.4	26.8	37.9	49.1
Cast-iron pipe	25.8	36.4	37.2	50.7
Marble, granite, slate	26.6	24.9	23.0	29.8
Cement	28.4	39.1	41.1	50.0
Steam and hot water apparatus	33.1	37.5	45.5	57.2
Furniture	31.4	36.2	45.4	51.5
Capital equipment				
Electrical machinery, apparatus, supplies	29.5	41.9	51.7	60.2
Blast furnaces, steel works, rolling mills	37.0	51.4	64.8	82.7
Steam railroad repair shops	43.7	50.9	53.6	63.7
Locomotives	10.4	24.6	23.1	34.4
Hardware	39.8	51.8	51.6	55.8
Consumers' goods				
Baking	71.6	82.7	83.9	89.8
Slaughtering and meat packing	67.7	90.5	76.0	79.6
Cotton goods	66.7	78.4	79.6	85.5
Women's clothing	52.2	65.2	70.6	71.9
Automobiles	34.4	61.3	80.4	85.9
Petroleum refining	68.4	77.6	81.7	85.3

SOURCE: U. S. Bureau of Labor Statistics. The indexes have been adjusted by the National Bureau of Economic Research to conform to the trend shown by the 1933 Census of Manufactures.

[1] Average of first 9 months only.

is illustrated by the behavior of payrolls and employment in manufacturing. The level of employment remained, except for minor fluctuations, relatively stable from the middle of 1934 to the middle of 1935; then began the rise that is still in progress. Thus, from June 1934 to June 1935 employment in manufacturing decreased 2.1 per cent; from June 1935 to June 1936 it increased 8.2 per cent. In the five months since May 1936 employment has exceeded that in the same months of the preceding year by nearly 8 per cent. Variations in payrolls reflect somewhat similar trends. Comparisons of the movement of factory payrolls in the twelve-month periods, July to June, show the very considerable increase in the first year of the recovery, 1933-34, the retardation in the rate of increase in the second year, and the acceleration in 1935-36. Thus in the first year payrolls increased 43.4 per cent; in the second, 8.1 per cent, and in the third and latest year, 15.2 per cent. In the five months from May to September 1936 payrolls were 17 per cent greater than in the same months of the preceding year.

TWELVE MONTHS ENDING JUNE 15	INDEX NUMBERS OF PAYROLLS (*1929=100*)
1932-33	38.7
1933-34	55.5
1934-35	60.0
1935-36	69.1

It should be observed that the basic data on which many of the foregoing conclusions rest are of unequal value. The field of governmental statistics relating to wages and employment has been enormously extended since 1929, and in the process of expansion established series have been improved and new ones introduced. Time and experiment are required for collecting data and for testing their adequacy and reliability. For some classes of employment this is easier than for others. The Class I railroad statistics may be accepted with a considerable measure of confidence because of the method of their collection and the scope of their coverage. The manufacturing statistics are reasonably reliable since they cover from 40 to 50 per cent of the estimated total number employed in factories and have been corrected to conform with the results of the 1933 biennial census of manufactures. The series for trade, services and construction stand, however, on a different footing. They are new and tentative and pertain to fields of employment in which as yet no frequent and regular censuses are taken. The first Census of Business, covering trade and various of the services, was taken for 1929. Since then additional censuses, not strictly comparable with the first or with one another, have been taken for 1933 and 1935. The results

of the 1935 census are now being published but preliminary totals are available for retail trade only. If the index numbers of employment and payrolls in retail trade, given in Table 1, are corrected by the preliminary results of this census, the index number of employment in 1935 is raised from 82.3 to 88.6 or more than 7 per cent, and the index number of payrolls from 62.1 to 68.8 or more than 10 per cent. These corrections suggest the possible margins of error in this and related series, but there is no way to take them into account until more complete census figures become available and the current series themselves are further improved in adequacy and reliability.

2. Weekly Earnings and Hours Worked

Per capita weekly earnings have steadily increased in almost all the major classes of employment in every year since 1933 (Table 4). In anthracite coal mining there was a substantial decline from 1934 to 1935, following a substantial increase in the preceding year, and in crude petroleum producing there was a nominal decline from 1933 to

Table 4

Average Per Capita Weekly Earnings, Manufacturing and Non-manufacturing Industries, 1929-1936

	1929	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*[5]
All manufacturing industries	$27.36	$25.39	$22.51	$18.18	$17.60	$19.12	$21.03	$22.36
Selected manufacturing industries								
Cotton goods	15.65	14.51	13.56	10.83	11.39	12.59	13.05	13.55
Blast furnaces, steel works, rolling mills	32.17	28.75	22.13	13.78	16.80	19.12	23.04	26.52
Steam railroad repair shops	31.20	29.48	26.94	22.50	22.74	24.14	26.53	28.23
Foundry and machine shop products	30.86	27.55	22.45	16.92	17.13	20.24	22.63	24.97
Automobiles	32.90	28.58	25.50	20.87	20.87	23.01	27.18	28.78
Boots and shoes	21.60	18.86	17.60	14.94	15.21	17.22	17.88	17.50
Knit goods	19.33	17.79	16.00	13.38	13.47	15.45	16.38	16.41
Lumber, sawmills	20.62	19.68	16.00	11.77	12.33	14.30	16.46	18.88
Baking	26.94	27.09	25.73	23.14	21.62	21.79	21.68	22.79
Women's clothing	24.24	25.34	23.34	18.19	16.84	18.51	18.63	18.72
Men's clothing	22.84	20.00	18.13	13.70	14.14	16.26	18.16	18.44
Extractive industries								
Coal mining	26.42	24.24	19.92	16.34	16.90	20.18	20.91	22.57
Anthracite	30.85	31.41	26.89	24.86	25.61	27.09	25.60	25.22
Bituminous	25.00	21.93	17.74	13.78	14.29	18.10	19.50	21.77
Other mining								
Metalliferous	30.12	28.13	22.99	18.63	19.21	20.82	22.73	24.08
Non-metallic and quarrying	26.28[1]	24.73	20.95	15.99	14.50	15.58	16.59	18.76
Crude petroleum producing	.....	35.55[2]	34.26	29.92	27.53	27.44	28.73	29.55
Public utilities	29.56[3]	30.31[3]	30.58	28.55	27.07	27.88	28.98	30.14
Telephone and telegraph	.....	28.68[3]	29.27	27.52	26.12	27.10	28.30	29.15
Electric light and power and gas	.....	31.61[3]	31.56	30.15	28.72	29.29	30.48	31.54
Electric railroads and motor buses	.....	31.45[3]	31.43	28.41	26.78	27.58	28.47	30.16
Trade	25.65	26.06	25.46	22.72	21.15	21.71	22.09	22.98
Wholesale	30.19	31.24	30.61	27.72	26.11	26.35	26.94	28.37
Retail	23.80	23.95	23.44	20.75	19.20	19.89	20.19	20.86
Service industries								
Laundries	.....	19.86[4]	18.54	16.26	14.74	15.02	15.55	16.04
Dyeing and cleaning	.....	23.84[4]	22.09	18.85	16.73	17.82	18.24	18.58
Hotels	16.98	17.07	16.06	14.24	12.79	13.15	13.57	13.96
Class I railroads	32.62	31.99	30.87	27.15	26.83	28.05	30.82	32.20
Building construction (private)	.....	.....	30.36	25.44	21.58	22.79	24.16	25.91

Sources: U. S. Bureau of Labor Statistics, except for Class I railroads. The railroad statistics are based on data published by the Interstate Commerce Commission. The group averages for coal mining, public utilities and trade are weighted averages computed by the National Bureau of Economic Research.

[1] Average of the last 7 months only.

[2] Average of the last 9 months only.

[3] Unweighted average published by the U. S. Bureau of Labor Statistics.

[4] Averages of the last 2 months only.

[5] Average of the first 8 months only.

1934. In all major industries except anthracite coal mining weekly earnings were higher in 1936 than in 1933, although in many the difference was not great. Among the major groups listed in Table 4 the greatest increase over the entire period of recovery, 1933-36, was in bituminous coal mining—52.3 per cent. In 1933 the earnings of wage earners in bituminous coal mines averaged only $14.29 a week. The next largest increases—over 25 per cent—were in total manufacturing and in mining other than coal. But in several individual manufacturing industries the increase in per capita weekly wages equalled or exceeded that in bituminous coal mining. The earnings, for example, of employees in blast furnaces, steel works and rolling mills increased, 1933-36, from $16.80 to $26.52 a week, or 57.9 per cent, and of employees in sawmills from $12.33 to $18.88, or 53.1 per cent. The anthracite coal mining industry showed a slight decline. In public utilities and trade the rise was less than 15 per cent, but in both industries the decline during the depression was much less than in manufacturing and bituminous coal mining. In the service industries the recorded recovery in weekly wages has been slight, amounting only to 11 per cent in dyeing and cleaning, and to approximately 9 per cent in both hotels and laundries. It is only fair to say, however, that the statistics for these classes of employment are probably for many reasons the least reliable of all. Average per capita weekly earnings in selected industries, for each month, 1929-36, are shown in Chart 3.

The rise in per capita weekly wages since 1933 is the combined result of increases in wage rates and in the number of hours worked per week; but in most industries the increase in wage rates, and hence in hourly earnings, has been the decisive factor. Average hours worked per week in each year, 1933-36, are shown in Table 5. In all industries except anthracite coal mining, telephone and telegraph, and Class I railroads the average hours worked per week, reflecting mainly the reduction of schedules of hours under the N.R.A., were fewer in 1934 than in 1933. Since 1934, average hours of work have tended to increase, but at a slower rate. In manufacturing they rose 5.5 per cent 1934-35, 5.2 per cent 1935-36, but were in the latest year, 1936, only 1.6 per cent higher than in 1933. Hours in bituminous coal mining declined in both 1934 and 1935, increased 4.9 per cent 1935-36, and in 1936 remained 6.1 per cent below 1933. In fact, among non-manufacturing industries, only in non-metallic mining and quarrying and in rail transportation were average hours worked per week in 1936 substantially in excess of 1933. Average hours worked per week in selected industries, 1933-36, are shown by months in Chart 4.

Weekly earnings in 1936 are considerably less than in 1929 in nearly all the industries included in Table 4. In public utilities they are slightly higher than in 1929 and in rail transportation the decline is less than 5 per cent. In

CHART 3

AVERAGE PER CAPITA WEEKLY EARNINGS
1929–1936

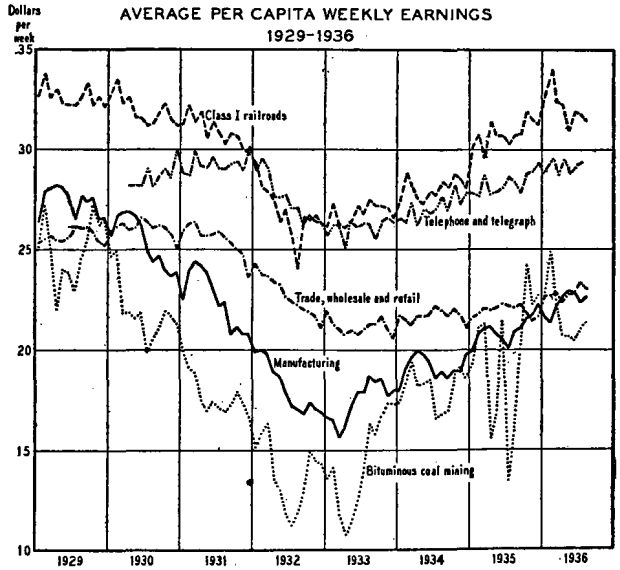


CHART 4

AVERAGE HOURS WORKED PER WEEK
1933–1936

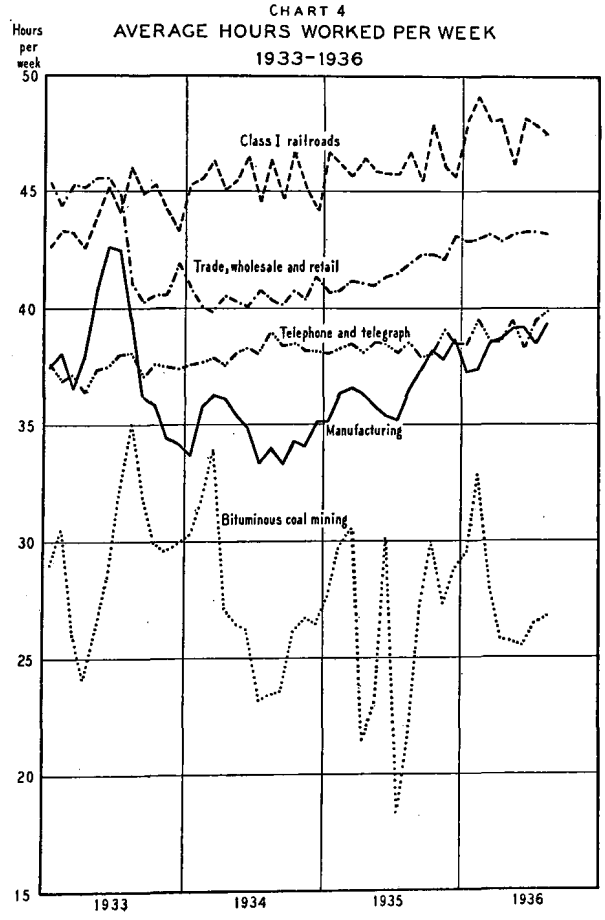


TABLE 5

AVERAGE HOURS WORKED PER WEEK, AND AVERAGE HOURLY EARNINGS, MANUFACTURING AND NON-MANUFACTURING INDUSTRIES, 1933-1936

	AVERAGE HOURS WORKED				AVERAGE HOURLY EARNINGS			
	1933	*1934*	*1935*	*1936*[1]	*1933*	*1934*	*1935*	*1936*[1]
All manufacturing industries	37.9	34.7	36.6	38.5	$.460	$.548	$.568	$.573
Selected manufacturing industries								
Cotton goods	41.8	33.2	34.6	37.0	.281	.378	.377	.366
Blast furnaces, steel works, rolling mills	31.9	30.4	34.8	39.9	.523	.632	.663	.664
Steam railroad repair shops	36.8	38.5	39.3	41.4	.628	.628	.675	.684
Foundry and machine shop products	32.3	34.7	37.8	41.7	.527	.586	.598	.597
Automobiles	34.6	33.1	37.0	37.6	.601	.697	.736	.765
Boots and shoes	.....	34.8	35.5	35.3	.....	.495	.513	.499
Knit goods	39.8	33.6	34.6	35.5	.364	.464	.479	.473
Lumber, sawmills	37.3	33.5	37.2	40.9	.333	.435	.447	.467
Baking	44.4	40.6	40.4	42.1	.460	.529	.534	.542
Women's clothing	.....	.....	31.8[2]	33.8	.....	.....	.545[2]	.513
Men's clothing	.....	28.0	30.3	32.0	.....	.575	.592	.563
Extractive industries								
Coal mining	29.8	28.4	27.4	28.2	.571	.712	.765	.803
Anthracite	31.2	32.8	31.1	30.3	.819	.826	.823	.832
Bituminous	29.4	27.1	26.3	27.6	.496	.678	.747	.794
Other mining								
Metalliferous	39.1	36.8	38.4	41.0	.491	.559	.585	.584
Non-metallic and quarrying	36.1	33.1	34.8	40.0	.408	.473	.475	.469
Crude petroleum producing	42.2	35.1	36.0	37.9	.647	.778	.779	.770
Public utilities	41.9	40.2	40.4	41.6	.650	.695	.722	.736
Telephone and telegraph	37.4	38.1	38.4	39.1	.705	.723	.760	.774
Electric light and power and gas	44.4	39.0	39.3	40.2	.644	.752	.775	.783
Electric railroads and motor buses	45.6	45.4	45.4	46.5	.578	.602	.617	.637
Trade	43.4	40.5	41.6	43.1	.478	.545	.556	.564
Wholesale	45.2	41.4	41.3	42.5	.566	.630	.648	.667
Retail	42.7	40.2	41.7	43.4	.444	.511	.520	.523
Service industries								
Laundries	40.7	39.3	40.7	42.4	.354	.377	.366	.373
Dyeing and cleaning	43.4	40.2	41.6	42.8	.394	.443	.437	.439
Hotels	50.7	47.3	47.8	48.4	.238	.271	.279	.285
Class I railroads	44.0	45.5	46.2	47.9	.609	.617	.667	.672
Building construction (private)	.....	28.7	29.9	31.8	.....	.793	.815	.814
Common labor in roadbuilding					.345	.409	.409	.400

SOURCES: U. S. Bureau of Labor Statistics except for Class I railroads and for common labor in roadbuilding. The former are based on data published by the Interstate Commerce Commission, the latter on data published by the Bureau of Public Roads. The group averages for coal mining, public utilities and trade are weighted averages computed by the National Bureau of Economic Research.

[1] Average of first 8 months only.

[2] Average of last 8 months only.

manufacturing the decline amounts to five dollars a week, or 18.3 per cent. Available data on the length of the average work-week in 25 manufacturing industries, 1929-36, indicate that the decline in weekly earnings is roughly equivalent to the reduction in the length of the work-week. According to the following series published by the National Industrial Conference Board, average hours worked per week in manufacturing industries declined from 48.3 in 1929 to 39.3 in 1936, or 18.6 per cent.[1] In the same period weekly earnings in manufacturing, as reported by the Na-

AVERAGE HOURS WORKED PER WEEK IN MANUFACTURING

1929	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936 (first 9 months)*
48.3	43.9	40.4	34.8	36.4	34.7	37.2	39.3

[1] The statistics of average hours worked per week reported by the National Industrial Conference Board differ materially from those reported by the U. S. Bureau of Labor Statistics, although the trend is the same. The differences are due in the main to differences in the composition of the samples for manufacturing industries. The Board's sample is limited to 25 industries; the Bureau's covers 75-87. The Board's series of hours worked is used here because the Bureau's series is not available for any year prior to 1932.

tional Industrial Conference Board, declined from $28.55 to $24.16, or 15.4 per cent.

3. Hourly Earnings

In view of the relatively small increases since 1933 in the average hours worked per week, it was to be expected that the movement of weekly wages would closely parallel that of hourly earnings. Weekly wages per worker, accordingly, increased most in the industries in which hourly earnings increased most. In all industries hourly earnings rose substantially from 1933 to 1936. Anthracite coal mining shows only a nominal increase because the rate in 1933, $.819, was already relatively high. The largest increase among non-manufacturing industries, 60.1 per cent, was in bituminous coal; the second, over 20 per cent, in the electric light and power industry. The other increases ranged from 10 to 20 per cent, although wage rates in laundries appear to have increased only about 5 per cent. The wage rate of railroad labor increased 10.3 per cent as a result of the restoration of the wage cut accepted by the railroad unions during the depression. Although total manufacturing shows an increase in hourly earnings, 1933-36, of only 24.6 per cent, the percentage increases in the manufacture of cotton goods, boots and shoes and lumber are 30.2, 36.0 and 40.2 respectively. Average hourly earnings in selected industries, 1933-36, are shown by months in Chart 5.

It is clear from Table 5 that by far the greatest part of the advance in wages beginning in the second half of 1933 was made in the early stages of the recovery. Since then the general level of wage rates has remained relatively stable. Hourly earnings in manufacturing industries increased 19.1 per cent from 1933 to 1934, 3.6 per cent from 1934 to 1935, and 0.9 per cent from 1935 to 1936. In bituminous coal mining the respective increases were 36.7, 10.2 and 6.3 per cent; in public utilities, 6.9, 3.9 and 1.9; and in trade 14.0, 2.0 and 1.4. Quite obviously the major advance in hourly earnings was in part a rebound from the low points of the depression and in part a response to the wage-fixing activities of the N.R.A. Hourly earnings in manufacturing, in fact, increased 25.6 per cent from June to December 1933. Thereafter the increases were very slight, and by August 1936 average hourly wages had advanced less than one cent over January 1935. But the wage increases announced by many large industries in November 1936 presage another general rise in the level of wage rates, particularly for manufacturing labor.

Hourly earnings in all manufacturing industries combined were apparently not much affected by the decision of the United States Supreme Court, May 27, 1935, that brought the operations of the N.R.A. to an end. Between May 1935 and August 1936 the average hourly earnings of factory labor remained practically stationary at $.57. In some industries wages were reduced materially; in others they rose. But in no industry did the decline exceed 10 per cent. Average hourly earnings in selected manufacturing industries before and after the Schechter decision are shown in Table 6. Among these industries the largest decreases in average hourly earnings were in silk and rayon and shirts and collars, where the declines amounted to 7.6 and 9.1 per cent respectively. In cotton textiles the decrease was 5.0 per cent. The largest increase in average

CHART 5
AVERAGE HOURLY EARNINGS
1933–1936

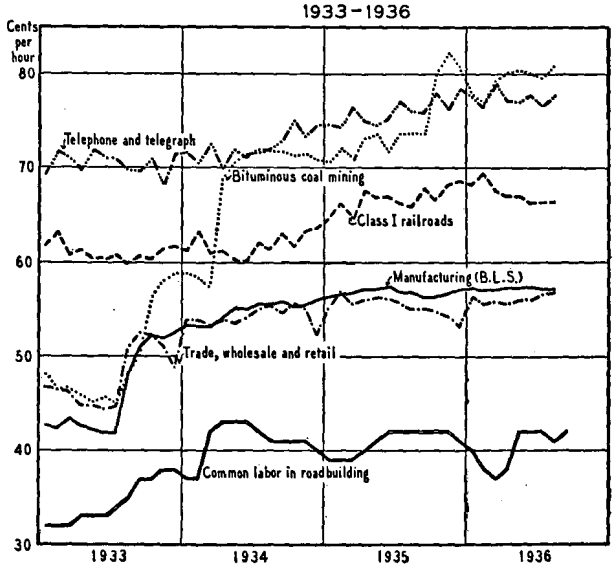


TABLE 6

AVERAGE HOURLY EARNINGS IN SELECTED MANUFACTURING INDUSTRIES, MAY 1935 AND AUGUST 1936

INDUSTRY	*May 1935*	*August 1936*	*% Change*
Canning and preserving	$.406	$.389	—4.2
Slaughtering and meat packing	.561	.559	—0.4
Cotton goods	.382	.363	—5.0
Knit goods	.480	.480	0.0
Silk and rayon goods	.458	.423	—7.6
Woolen and worsted goods	.496	.497	+0.2
Men's clothing	.583	.561	—3.8
Shirts and collars	.408	.371	—9.1
Women's clothing	.519	.560	+7.9
Blast furnaces, steel works, rolling mills	.663	.668	+0.8
Agricultural implements	.616	.609	—1.1
Automobiles	.720	.773	+7.4
Furniture	.450	.457	+1.6
Lumber, sawmills	.427	.485	+13.6
Boots and shoes	.520	.496	—4.6
Rubber tires	.837	.878	+4.9
Cigars and cigarettes	.399	.401	+0.5
All manufacturing industries	.571	.571	0.0

SOURCE: U. S. Bureau of Labor Statistics

hourly earnings was in sawmills—13.6 per cent; the second—7.9 per cent—in women's clothing; the third—7.4 per cent—in the automobile and automotive parts industry.

Available data on the average hourly earnings of common labor in roadbuilding and of unskilled and female labor in manufacturing suggest that the minima established by the codes of fair competition have not been generally reduced since the death of the N.R.A., although they have declined in some industries and occupations. The hourly wage rates of common labor in roadbuilding rose from $.345 in 1933 to $.409 in 1934 and have remained at about that level. The average hourly earnings of female employees, and of unskilled and skilled and semi-skilled male employees in manufacturing for 1929 and 1933-36, are shown in Table 7.

TABLE 7

AVERAGE HOURLY EARNINGS IN MANUFACTURING, BY SEX AND SKILL 1929 AND 1933-1936

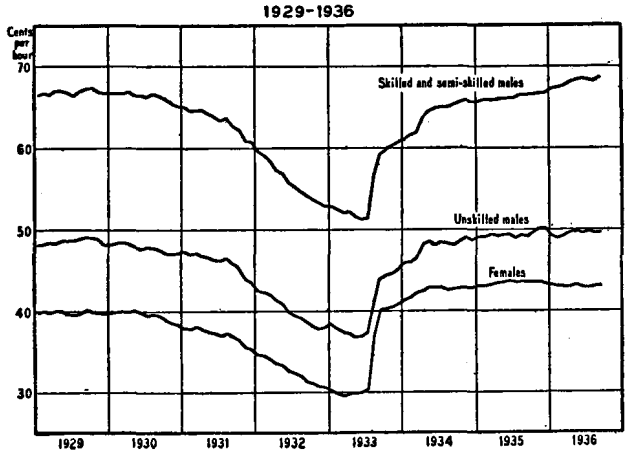
Year	*Females*	*Unskilled males*	*Skilled and semi-skilled males*
1929	$.398	$.486	$.668
1933	.340	.401	.550
1934	.425	.478	.642
1935	.434	.494	.662
1936[1]	.430	.495	.681

SOURCE: National Industrial Conference Board

[1] Average of first 9 months only.

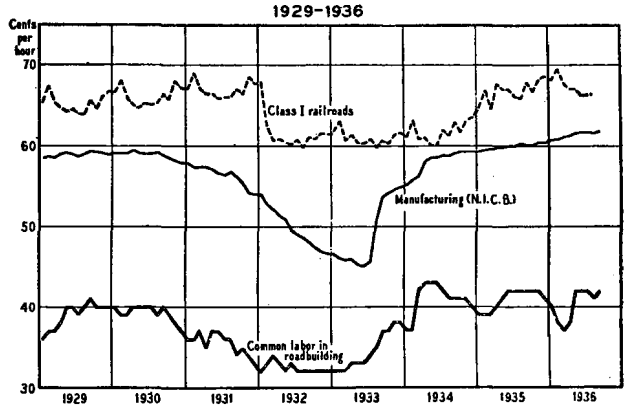
While these figures are not the very best measures of the wage rates of employees affected by the provisions of minimum wage legislation, they are a reasonably satisfactory sample of the average wages paid to classes of low-paid labor and roughly indicate changes in wage differentials. They show that the increases in average wage rates achieved in the early months of the recovery and during the existence of the N.R.A. have been generally retained since then and that the increases gained by women and the unskilled have not been at the expense of the skilled. Monthly data of average hourly earnings of manufacturing employees by sex and skill, 1929-36, are given in Chart 6.

CHART 6
AVERAGE HOURLY EARNINGS IN MANUFACTURING, BY SEX AND SKILL 1929-1936



In many industries average hourly earnings have returned to their 1929 levels and in some they exceed the rates then in force. Statistics of hourly earnings back to 1929 are not available for all classes of industry, but where they are, they show that the losses in wage rates suffered during the depression have been recovered. Average hourly earnings per year, 1929-36, for coal mining, manufacturing, rail transportation, and common labor in roadbuilding are shown in Table 8, and monthly data for the last three industries are given in Chart 7.

CHART 7
AVERAGE HOURLY EARNINGS 1929-1936



4. THE COST OF LIVING AND REAL WAGES

The main features of the changes in the cost of living during the depression and recovery are well known. From December 1929 to June 1933, according to index numbers published by the United States Bureau of Labor Statistics, the cost of goods purchased by wage earners and lower salaried workers declined slightly more than 25 per cent. From June 1933 to July 15, 1936, the latest date for which figures are available, the cost of living increased 10 per cent.

Changes in the prices of the principal items entering into the cost of living have varied materially through the periods of depression and recovery. In the long decline of living costs from 1929 to 1933, food, rent, house furnishings and clothing declined much more than fuel and light and the miscellaneous times. When costs were rising, 1933-36, the food group rose most; rent is reported to be lower in 1936 than in 1933. From 1935 to 1936, when the index of the cost of living rose 1.0 per cent, the largest advances among the constituent items were 2.0 per cent for food and 1.5 per cent for rent. In 1936, rent was furthest below 1929, followed by food, clothing and house furnish-

TABLE 8

AVERAGE HOURLY EARNINGS, SELECTED INDUSTRIES, 1929-1936

	1929	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*[1]
Manufacturing[2]	$.590	$.589	$.564	$.498	$.491	$.581	$.600	$.614[6]
Anthracite coal mining[4]	.....	.....	.824	.823	.819	.826	.823	.832
Bituminous coal mining[4]	.659	.....	.598	.518	.496	.678	.747	.794
Class I railroads[5]	.651	.660	.669	.615	.609	.617	.667	.672
Common labor in roadbuilding[6]	.390	.393	.355	.324	.345	.409	.409	.400

[1] Average of first 8 months only.

[2] National Industrial Conference Board. The U. S. Bureau of Labor Statistics series of hourly earnings in manufacturing industries begins in 1932. Since figures published by the National Industrial Conference Board are available for the earlier years, they are used in this table. The average hourly earnings of manufacturing employees, reported by the Board, run consistently higher than those reported by the Bureau. Thus the average hourly earnings of manufacturing employees in 1936 are reported by the Board as $.614 and by the Bureau as $.573. These differences are due to variations in the two samples of manufacturing industries. The Board's sample is heavily weighted by industries paying higher rates of wages and, in addition, excludes the cotton textile industry of the South where hourly wages are substantially below those paid in the cotton textile industry of the North. Inspection of scattered data on hourly earnings in 14 large manufacturing industries for years prior to 1932, published in special studies by the U. S. Bureau of Labor Statistics, confirms the general trend in manufacturing hourly wages indicated by the series of the National Industrial Conference Board.

[3] Average of first 9 months only.

[4] U. S. Bureau of Labor Statistics.

[5] Computed by the National Bureau of Economic Research from data published by the Interstate Commerce Commission.

[6] U. S. Department of Agriculture, Bureau of Public Roads.

ings. The percentage changes in these items in the cost of living for various years 1929-36 are shown in Table 10.

During the recovery the weekly earnings of employees in most categories of industry have increased faster than the cost of living. The purchasing power of their earnings, or their real wages, has consequently risen, in some instances quite substantially. Among non-manufacturing industries, the greatest increase in real weekly earnings from 1933 to 1936 was received by employees of the bituminous coal mining industry, the smallest by employees in trade. The real weekly earnings of employees in manufacturing advanced 18.1 per cent, 1933-36; in anthracite coal mining they declined 8.4 per cent.

Average hourly earnings likewise have risen faster than living costs and, in consequence, real average hourly earnings have increased in most classes of employment. Among non-manufacturing industries, real wages per hour, like real wages per week, recorded the largest increase from 1933 to 1936 in bituminous coal mining—48.9 per cent. The real average hourly earnings of manufacturing labor rose 15.9 per cent; in anthracite coal mining there was a decline of 5.5 per cent. Percentage changes from 1933 to 1936 in real average weekly and real average hourly earnings are given in Table 11.

Since hourly earnings are generally as high in 1936 as in 1929, their present purchasing power is considerably in excess of the purchasing power of comparable rates of wages per hour in 1929. Thus the real hourly earnings of factory employees in 1936 were 27 per cent greater than in 1929; of railroad labor 26 and of common labor in roadbuilding 25 per cent. Weekly earnings in 1936, on the other hand, were in general less than in 1929, and in many industries

TABLE 9

COST OF LIVING, INDEX NUMBERS, 1929-1936[1]

(*1929=100*)

1929	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*
100.0	97.9	89.5	80.8	76.2	78.8	81.1	81.9

[1] Annual averages computed by the National Bureau of Economic Research from revised indexes published by the U. S. Bureau of Labor Statistics. The index for each year, 1929-33, is an average of the December index of the preceding year, December of the indicated year, and June of the indicated year with a weight of two. For 1934 it is an average of the index for December 1933, November 15, 1934 and June 1934 with a weight of two. For 1935 it is an average of the index for March 15, 1935, October 15, 1935 and July 15, 1935 with a weight of two. For 1936 it is an average of January 15, April 15 and July 15, 1936.

TABLE 10

MAJOR ITEMS IN THE COST OF LIVING, PERCENTAGE CHANGES, 1929-1936

PERIOD	ALL ITEMS	FOOD	CLOTHING	RENT	FUEL AND LIGHT	HOUSE-FURNISHING GOODS	MISCELLANEOUS
1929-1933	—23.8	—36.6	—23.9	—28.5	—11.0	—25.0	—5.7
1933-1936	+7.5	+23.7	+11.0	—5.6	0.0	+14.2	—0.7
1935-1936	+1.0	+2.0	+0.6	+1.5	+0.9	+1.1	—0.2
1929-1936	—18.1	—21.5	—15.5	—32.4	—11.0	—14.4	—6.4

SOURCE: Based on index numbers published by the U. S. Bureau of Labor Statistics; see Table 9, note 1.

substantially less. Real wages per week, therefore, were materially in excess of 1929 wages only where actual weekly earnings had reached pre-depression levels. Thus, in public utilities real weekly earnings in 1936 were 24.5 per cent above 1929; on the railroads, 18.1, and in wholesale trade, 14.8 per cent. In bituminous coal mining real weekly earnings were only 6.3 per cent higher than in 1929, while in manufacturing they just about equalled those of 1929.

TABLE 11

REAL AVERAGE WEEKLY AND REAL AVERAGE HOURLY EARNINGS MANUFACTURING AND NON-MANUFACTURING INDUSTRIES PERCENTAGE CHANGES, 1933 to 1936

INDUSTRY	*Percentage Changes, 1933 to 1936*[1] REAL AVERAGE WEEKLY EARNINGS	REAL AVERAGE HOURLY EARNINGS
Manufacturing	+18.1	+15.9
Extractive industries		
Coal mining	+24.3	+30.8
Anthracite	—8.4	—5.5
Bituminous	+41.7	+48.9
Other mining		
Metalliferous	+16.7	+10.6
Non-metallic and quarrying	+20.4	+7.0
Crude petroleum producing	—0.2	+10.7
Public utilities	+3.5	+5.3
Telephone and Telegraph	+3.8	+2.1
Electric light and power and gas	+2.1	+13.1
Electric railroads and motor buses	+4.7	+2.5
Trade	+1.1	+9.8
Wholesale	+1.1	+9.6
Retail	.....[2]	+9.6
Service industries		
Laundries	+1.2	—2.0
Dyeing and cleaning	+3.3	+3.6
Hotels	+1.5	+11.3
Class I railroads	+9.4	+2.6
Building construction (private)	+11.7	.....[3]

[1] Average of first 8 months only.

[2] The weekly earnings per employee in retail trade appear to be inconsistent with the statistics of hourly earnings and average hours worked per week in retailing, all reported by the U. S. Bureau of Labor Statistics. If weekly wages are computed by multiplying the hourly rate of wages in 1936, $.523, by the number of hours worked per week in 1936, 43.4, wages per week are found to be $22.70, instead of $20.86, as reported by the Bureau in its monthly bulletin, *Employment and Payrolls*. In view of these discrepancies, no figure for the percentage change in real weekly earnings of employees in retail trade is included in this table.

[3] Not available.

DR. WOLMAN is at work on an analytical account of wages in the United States since 1914. He also plans to write a *Bulletin* next year on the membership of trade unions here and in England.

The first three issues of the *Bulletin* will be as previously announced: two on agriculture and one giving national income totals since 1919. The income totals will supplement and supercede those in *Bulletin 59,* which covered nine basic industries. Estimates of income originating in finance, government, the service industries and miscellaneous activities will be given. The fifth in the 1937 series will be on some topic of current interest such as productivity and employment or banking and credit.

Ebb and Flow in Trade Unionism BY LEO WOLMAN
(251 pp., 48 tables, 5 charts, $2.50)

From a review in *The Annalist,* November 20, 1936:

"This book supplements *The Growth of American Trade Unions, 1880-1923.* It gives current, authoritative and complete figures on trade union membership. It is a general discussion of developments in trade unionism during the N.R.A. and of the present division within the ranks of the American Federation of Labor. It takes up, in the light of their settings, many of the problems facing the labor movement in America.

Though well known for his sympathetic attitude toward trade unionism, Dr. Wolman succeeds admirably in maintaining the traditions of the National Bureau of Economic Research with respect to the scientific, detached viewpoint. In conclusion he refuses to be stampeded by the dramatic incidents of the last three months, but holds to the general principles that in the long run determine the trend of the labor movement."

National Bureau of Economic Research

BULLETIN 68

DECEMBER 27, 1937

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Union Membership in Great Britain and the United States

LEO WOLMAN

Copyright 1937, National Bureau of Economic Research, Inc.

THE course pursued by organized labor in the United States during the last five years has aroused general interest in the progress of American trade unionism and in comparable developments in other countries. Since 1933 American unions have multiplied in number and membership. They have organized many employees in industries, such as steel and automobiles, hitherto regarded as almost immune to unionization. They have received considerable encouragement and support from agencies of government, and much of governmental policy has been directed toward removing obstacles in the way of union growth. The laws governing trade unions—federal and state—have been thoroughly revised and elaborate administrative machinery has been set up to apply the provisions of the new legislation. In the process of adjusting itself to this new situation, the labor movement has encountered stubborn problems of internal management. It has split into two large and growing factions. The structure and policies of unions have changed radically. Aggregate membership has steadily grown until it now probably exceeds the previous peak of 5,047,800 members, reached in 1920.

American experience with organized labor and industrial relations has long appeared to stand in sharp contrast to British. Although this country had reached an advanced stage of industrialization, union membership remained until recently much smaller than in Great Britain and a majority of the employees in American industries continued to be unorganized. The persistence of this discrepancy, which ran counter to accepted theories of union growth, has proved an intriguing problem in historical interpretation. And many students of trade unionism in America and Europe, accepting British developments in industrial relations as a model to be followed by this country, have speculated as to the causes of our alleged backwardness in this crucial area of human relations.

Now that American unions are again expanding and our labor relations appear to have entered a new phase whose goal and characteristics are still obscure, much of historical and scientific interest may be learned by comparing the size, strength, and fluctuations of the organized labor movements in Great Britain and the United States. This *Bulletin* presents statistics of union membership in these countries, 1897-1935; an analysis of the distribution of membership among industrial groups; and estimates of the percentage of employees organized in all industry and in its major subdivisions.

Such comparisons are necessarily rough and inadequate, for, aside from the difficulties of tracing changes in membership within one country, there are added difficulties in securing comparable data for two countries. Variations in methods of union accounting, in the procedure for dropping and reinstating members, in methods of dealing with the unemployed, and finally the difference between actual membership and what figures the union is prepared to publish as a measure of its strength, present insoluble problems in international comparisons of this sort.[1] But, defective and incomplete as the data are, they are sufficiently good to indicate comparative movement and extent of organization.

The formal suspension by the American Federation of Labor of the unions affiliated with the Committee for Industrial Organization and the ensuing struggle between these organizations for supremacy in the labor movement make American statistics of membership less reliable since 1935 than before. For that reason, the statistical comparisons in this *Bulletin* end in 1935. But the figures published for 1936 and 1937 by the A.F. of L. and the C.I.O. shed at least some light on the course of events in the United States since then, although they are probably not

[1] For discussion of these problems in the use of American statistics of membership see the author's *Ebb and Flow in Trade Unionism* (National Bureau of Economic Research, 1936), Ch. I.

NATIONAL BUREAU OF ECONOMIC RESEARCH BULLETINS—Annual Subscription (Five Issues), $1.00
Single copies, this issue, twenty-five cents

as accurate as earlier figures and cannot be tested for accuracy. They are, therefore, reproduced in this *Bulletin* as reported by the two organizations themselves.

I MEMBERSHIP

The annual membership of trade unions in Great Britain and Northern Ireland and in the United States, 1897-1935, is shown in Table 1 and Chart 1. During most of these thirty-nine years British unions have had a larger membership. Only in 1904 and 1905 did American membership exceed British, but the margins were very slight. Thereafter, the British excess grew larger until 1920, when it was more than 60 per cent. In the following years of declining membership, the difference again became somewhat smaller and by 1933 was reduced to nearly 50 per cent. After 1933 union recovery was much more rapid in this country than in Great Britain and in 1935 the difference in membership was less than 1,000,000, or roughly 25 per cent. Although the figures of union membership in this country since 1935 are subject to wide margins of error, there is every indication that American membership in 1937, even conservatively estimated, exceeds the British by a substantial amount.

Since 1897 both labor movements have passed through three phases and are apparently now in a fourth, whose duration is, of course, uncertain. From 1897 to 1915 there was a general advance in union membership, the British unions gaining 2,628,000 members and the American, 2,135,600. While the unions were sensitive to changing business conditions and lost members in years of business recession, the losses were generally slight; and in the United States the greatest decline was 5.9 per cent in 1909, reflecting the effects of the depression, 1907-08. In Great Britain the annual decline in membership in no year reached 2 per cent. During this period unfavorable conditions of employment and business resulted mainly in a decline in the rate of increase.

The second phase in the history of organized labor was that of the War and first post-War boom, 1915-20. The union movements of both countries nearly doubled their previous membership. Benefiting from full employment, shortage of labor, and sympathetic public policy, the British unions gained 3,989,000 members, and the American, 2,465,200.

The next phase was one of almost uninterrupted decline in union membership from a peak in 1920 to a trough in 1933. In both countries unions suffered heavy losses, the British surrendering about 4,000,000 members, or nearly one-half of their membership in 1920, and the American, more than 2,000,000, or 40 per cent of their membership at the peak. In both countries, also, the heaviest losses were in the years immediately following 1920, under the influence of the depression of 1921 and the drastic readjustment of industry associated with it, and the loss of the unassimilated membership acquired so quickly during the War. Neither the American nor the British labor move-

TABLE 1

TRADE UNIONS IN GREAT BRITAIN AND THE UNITED STATES
TOTAL MEMBERSHIP AND PERCENTAGE CHANGES FROM YEAR TO YEAR 1897-1935[1]

	GREAT BRITAIN		UNITED STATES	
YEAR	Total membership (000's)	Percentage change from preceding year	Total membership (000's)	Percentage change from preceding year
1897	1,731		447	
1898	1,752	+1.2	501	+12.0
1899	1,911	+9.1	611	+22.0
1900	2,022	+5.8	869	+42.1
1901	2,025	+0.1	1,125	+29.5
1902	2,013	−0.6	1,376	+22.3
1903	1,994	−0.9	1,914	+39.1
1904	1,967	−1.4	2,073	+8.3
1905	1,997	+1.5	2,022	−2.4
1906	2,210	+10.7	1,907	−5.7
1907	2,513	+13.7	2,080	+9.1
1908	2,485	−1.1	2,131	+2.4
1909	2,477	−0.3	2,006	−5.9
1910	2,565	+3.6	2,141	+6.7
1911	3,139	+22.4	2,343	+9.5
1912	3,416	+8.8	2,452	+4.7
1913	4,135	+21.0	2,716	+10.8
1914	4,145	+0.2	2,687	−1.1
1915	4,359	+5.2	2,583	−3.9
1916	4,644	+6.5	2,773	+7.4
1917	5,499	+18.4	3,061	+10.4
1918	6,533	+18.8	3,467	+13.3
1919	7,926	+21.3	4,125	+19.0
1920	8,348	+5.3	5,048	+22.4
1921	6,632	−20.6	4,781	−5.3
1922	5,625	−15.2	4,027	−15.8
1923	5,429	−3.5	3,622	−10.1
1924	5,544	+2.1	3,536	−2.4
1925	5,506	−0.7	3,519	−0.5
1926	5,219	−5.2	3,502	−0.5
1927	4,919	−5.7	3,547	+1.3
1928	4,806	−2.3	3,480	−1.9
1929	4,858	+1.1	3,443	−1.1
1930	4,842	−0.3	3,393	−1.4
1931	4,624	−4.5	3,358	−1.0
1932	4,444	−3.9	3,144	−6.4
1933	4,392	−1.2	2,973	−5.4
1934	4,591	+4.5	3,609	+21.4
1935	4,868	+6.0	3,889	+7.8

[1] Figures for Great Britain include Northern Ireland and are of membership at the end of the year; figures for the United States, which include the membership in Canada of unions whose head offices are in the United States, are of average membership for each year. The British figures are from the *Ministry of Labour Gazette*, October 1937.

ment appeared to be able to respond to the recovery of the 1920's, and apparently both movements entered the depression of 1930 near the rock bottom of their strength. For, in spite of exceptionally unfavorable conditions from 1930 to 1933, the British unions lost during the depression only 10 per cent and the American 14 per cent of their membership in 1929.

In 1934 union membership turned upward again. By 1935 the membership of American unions had risen 30 per cent over 1933 and was more than 400,000 greater than in 1929, while the British unions had increased 10 per cent and stood in the latest year just about where they were in 1929. Since 1935 the rise has continued in both countries, but measuring comparative changes is complicated by exceptional conditions in the American labor movement.

The turn that American trade unionism took in 1936 is well-known. A formal break between two factions within the A.F. of L. was acknowledged by the suspension from membership in it of ten unions affiliated with the C.I.O. This suspension was the signal for the beginning of unusual organizing activity, first by the C.I.O. and later by the A.F. of L. Within a year the C.I.O. had succeeded in organizing many hundreds of thousands of employees in the automobile, steel, metal, textile, and bus and subway transportation industries and in service occupations. In September 1937 the C.I.O. reported that the number of national unions affiliated with it had increased from 11 in August 1936 to 30[2] in the autumn of 1937. At the same time the A.F. of L., moved by the opportunities for organization and the threat of its younger rival, pursued its organizing campaigns with renewed vigor and success. The result of the combined efforts of the Federation and the C.I.O. was a general and substantial increase in membership.

How great this increase has been it is impossible, in the present state of things, to estimate with any degree of accuracy. The figures reported by the unions themselves obviously contain large and changing margins of error.

Membership of unions affiliated with the A.F. of L. is computed from the per capita tax paid to it by its affiliates. While the amount of per capita tax may be controlled by a union and on many occasions has been,[3] membership statistics computed from the per capita tax figures have proved reasonably reliable and have reflected over a long period changes in the strength of the American labor movement.

The C.I.O. is a new organization. The Committee's relation to its constituent unions is not yet clearly defined.

[2] These numbers do not include the Typographical, and the Hatters, Cap and Millinery Workers Unions, which have continued their affiliation with the A.F. of L., although active in the affairs of the C.I.O. They do include the Electrical and Radio Workers Union which, though not formally affiliated with the C.I.O. in August 1936, was closely identified with and soon joined it.

[3] See *Ebb and Flow in Trade Unionism*, Ch. I.

Chart 1

TRADE UNIONS IN THE UNITED STATES AND GREAT BRITAIN, TOTAL MEMBERSHIP 1897 - 1935

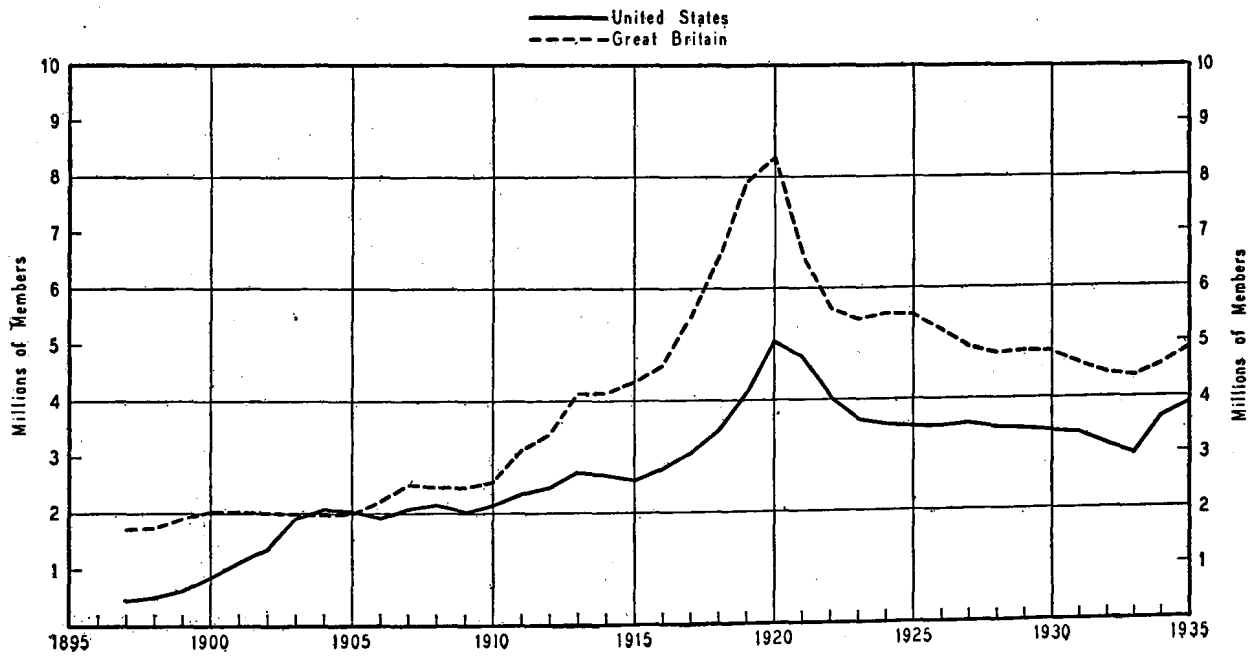


TABLE 2

REPORTED MEMBERSHIP OF UNIONS AFFILIATED WITH THE COMMITTEE FOR INDUSTRIAL ORGANIZATION,[1] 1936 AND 1937

	NAME OF UNION	THOUSANDS OF MEMBERS 1936[2]	1937
1	Mine Workers, United	Aug. 500	Sept. 600
2	Steel Workers Organizing Committee	10	Sept. 500
3	Automobile Workers, United	30	Aug. 400
4	Textile Workers Organizing Committee		Sept. 400[3]
5	Ladies Garment Workers, International	Aug. 160	Aug. 250
6	Clothing Workers, Amalgamated	Aug. 100	Aug. 177
7	Oil Workers International	45	Aug. 85
8	Rubber Workers, United	Sept. 25	Sept. 75
9	Mine, Mill and Smelter Workers	Dec. 17	Aug. 45
10	Flat Glass Workers, Federation of		14
11	Electrical, Radio and Machine Workers[4]	Sept. 25	Sept. 130
12	Woodworkers, International		Sept. 100
13	Transport Workers Union[5]		Sept. 88
14	Shoe Workers, United[6]		Aug. 50
15	Retail Employees, United		Oct. 40
16	Fur Workers, International		May 30
17	Longshoremen and Warehousemen's Union, International		Sept. 26
18	State, County and Municipal Workers		Sept. 25
19	Office and Professional Workers, United		Oct. 25
20	Marine and Shipbuilding Workers, Industrial Union of	Sept. 10	Sept. 20
21	Newspaper Guild, American		Sept. 14
22	Communications Association, American[7]		Aug. 8
23	Marine Engineers Beneficial Association, National		Aug. 7
24	Architects, Engineers, Chemists and Technicians, Federation of		Sept. 6
25	Federal Workers of America, United		June 4
26	Aluminum Workers of America		.....[8]
27	Die Casting Workers, National Association of		.....[8]
28	Leather Workers Association, National		.....[8]
29	Cannery, Agricultural, Packing and Allied Workers, United		.....[8]
30	Inlandboatmen's Union of the Pacific (provisional charter)		.....[8]
	Directly affiliated local unions (620)		Oct. 240
	Total		3,359

[1] Compiled from *Union News Service*, weekly publication of the C.I.O., and from the *Report* of Director John Brophy to the meeting of the Committee for Industrial Organization in Atlantic City, October 11, 1937.

[2] No total is given for 1936 since the figures for that year are incomplete.

[3] This number includes 225,000 reported as under contract at the beginning of September 1937.

The jurisdictional limits of the C.I.O. unions have not been fully described. The amount of dues received by C.I.O. affiliates from their members or paid by them to the C.I.O. is not reported. For these reasons there are no standards for testing membership figures published by the C.I.O. equivalent to those available for the A.F. of L. Both sets of figures probably overestimate current membership, for unions at war with employers and one another are impelled by considerations of strategy and prestige to exaggerate their progress and strength even in normal times. And the last two years have in this respect been far from normal. At present even the two organizations challenge each other's figures. Thus the C.I.O. regards the reported membership of the United Brotherhood of Carpenters, the biggest union in the A.F. of L., as considerably inflated because it does not allow for the loss of a large group of members who are alleged to have seceded from the Carpenters and to have formed a new union, the International Woodworkers, affiliated with the C.I.O. The A.F. of L., on its part, considers the membership reported by the new unions affiliated with the C.I.O. to be gross exaggerations. In connection with the current peace conferences being held between representatives of the two organizations, the Federation issued the following statement:[4]

> "At today's conference the representatives of the American Federation of Labor submitted and undertook to explain their proposal to the representatives of the C.I.O. During the course of the conference, members of the Committee representing the C.I.O. made extravagant and unsupported claims of membership, but on analysis it was clear to the committee of the American Federation of Labor that the C.I.O. has little, if any, dues-paying membership other than the members of the organizations that originally belonged to the American Federation of Labor."

Under the circumstances the most that can be done is to quote the figures issued by each organization with the caution that they will require thoroughgoing revision as more information becomes available. The membership of unions associated in the C.I.O., as currently reported by it (Table 2), are taken from the weekly newspaper, *Union News Service*, published by the C.I.O. There is no evi-

[4] *The American Federation of Labor Weekly News Service*, October 30, 1937, p. 2.

[4] Formerly the United Electrical and Radio Workers.

[5] This union claims 34,000 members among subway, elevated, trolley, and bus employees, and 11,300 among taxi employees in New York City.

[6] Formed, on March 6, 1937, by the amalgamation of the United Shoe and Leather Workers Union and the Shoe Workers Protective Union, both independent of the A.F. of L.

[7] Formerly the American Radio Telegraphists.

[8] Not reported.

dence that the membership reported is dues-paying or that it represents even the number of employees who have formally joined an organization. The membership of the Textile Workers Organizing Committee (United Textile Workers) is, for example, given as 400,000. This figure is reported to include 225,000 employees under contract at the beginning of September 1937. Total reported membership, then, presumably comprises 225,000 employees working for employers under contract with the union and 175,000 not under contract. It is probable, since the union is new and there are few closed-shop agreements, that the number working under contract exceeds actual membership in those shops and will continue to do so until the union becomes well established and generally accepted by the workers. The remaining membership of 175,000 claimed by the union is a round figure unsupported by data either on dues receipts or initiation fees. Figures for some unions are so large that they are hard to reconcile with the known strength of unions in the past or with the number employed in the industries over which these unions apparently claim jurisdiction. It may safely be estimated that the total membership of 3,357,800 currently claimed by the C.I.O. in many instances represents potential rather than actual membership and that it exceeds actual membership considerably. It will take a long time to determine the extent to which the membership reported by the C.I.O. has become dues-paying.

Membership of the unions affiliated with the A.F. of L. is reported as the average for the fiscal year ending August 31. Figures are given also each year for the month of August. From 1936 to 1937 average membership reported by the Federation for the fiscal year ending August 31 declined from 3,422,398 to 2,860,933, or more than 500,000, owing to the suspension of ten unions because of their affiliation with the C.I.O. Since these unions claimed somewhat more than 1,000,000 members at the time of their suspension, the growth of the unions remaining in the Federation made up nearly half of the loss in this year. The Federation reported its membership in August 1937 to be 3,271,726, or 314,841 below August 1936.

The gains made by A.F. of L. unions were in the main among old and established organizations long affiliated with the Federation. For it, unlike the C.I.O., has failed to profit from the creation and affiliation of new unions, apart from increases in the number and membership of 'local trade and federal labor unions'. From August 31, 1936 to August 31, 1937 the number of these organizations increased from 914 to 1,406 and their membership from 90,990 to 232,700. Approximately half of the increase, 1935-37, in the total membership of the unions that retained their affiliation with the Federation was contributed by relatively few unions. Thus the Carpenters reported 100,000 more members in 1937 than in 1935, the Teamsters, 73,900, the Hotel and Restaurant Workers, 50,100, the Hod Carriers, 47,300, the Machinists, 45,500, and the Electrical Workers, 41,200. The membership of fifteen A.F. of L. unions showing the greatest rise, 1935-37, is given in Table 3.

TABLE 3

A.F. OF L. UNIONS WITH LARGEST INCREASE IN MEMBERSHIP 1935-1937[1]

(in thousands)

	UNION	AVERAGE ANNUAL MEMBERSHIP 1935	1936	1937	INCREASE IN MEMBERSHIP 1935-37
1	Carpenters	200	300	300	100
2	Teamsters	137	161	211	74
3	Hotel and Restaurant Workers	57	74	107	50
4	Hod Carriers and Common Laborers	52	65	100	48
5	Machinists	93	114	138	45
6	Electrical Workers	130	170	171	41
7	Longshoremen	40	41	61	21
8	Railway Clerks	73	88	89	16
9	Painters	66	67	80	14
10	Building Service Employees	28	35	42	14
11	Retail Clerks	7	10	19	12
12	Bakery and Confectionery Workers	22	26	33	11
13	Meat Cutters	20	19	30	10
14	Firemen and Oilers	15	21	24	9
15	Government Employees	14	22	21	7
	Total	954	1,213	1,426	472

[1] *Report* of the A.F. of L. Executive Council to the 57th Annual Convention, October 4, 1937, pp. 13-14. Figures are for the average membership for the year ending August 31.

The third category of labor unions in American industry is comprised of independent unions that are affiliated with neither the A.F. of L. nor the C.I.O. Its membership in 1935 was roughly 570,000. Since 1935 a few large independent unions, such as the Marine and Shipbuilding Workers, the United Shoe and Leather Workers, and the Progressive Miners of America, have become affiliated with the C.I.O. or the A.F. of L. Membership in the group of independent unions has therefore shrunk and is now practically limited to the railroad brotherhoods. Allowing for the growth of the brotherhoods since 1935, membership of independent unions in 1937 may safely be estimated as not exceeding 550,000.

Accepting the figures reported by the A.F. of L. and the C.I.O. and the estimated membership of independent unions, the total number of union members claimed by all American unions in August-September 1937 is 7,179,526.

Unions affiliated with the A.F. of L.	3,271,726
Unions affiliated with the C.I.O.	3,357,800
Independent unions	550,000

The membership of British unions is not yet available beyond 1936. In that year, when the British unions had 5,307,689 members, their membership probably exceeded the American by roughly one million. In 1937, allowing for some further growth of British membership and accepting the exaggerated claims by American unions, this situation is reversed and American membership probably exceeds the British, although by how much is hard to estimate. Since 1933 American unions have apparently more than doubled their membership and have now the largest on record. In Great Britain between 1933 and 1936 the unions gained over 900,000 members, or 20.8 per cent, but remained, in the latest year for which data are available, with three million fewer members than in 1920.

II INDUSTRIAL DISTRIBUTION OF UNION MEMBERSHIP

Gross changes in the number belonging to unions are the consequence not alone of general increases and declines in membership but also of shifts in the position of individual unions or groups of unions. These shifts reveal themselves in the changing composition of the labor movement and appear to be common to all countries in which it has failed to achieve complete unionization. At any one time union membership in both Great Britain and the United States is concentrated in relatively few groups of unions. And the group that occupies a predominant position at one time frequently fails to do so at another.

The reasons for these differences are many. Fluctuations in union membership are often closely identified with changes in employment in the industry over which a given union claims jurisdiction. Consequently, established unions in industries with expanding employment will retain a greater proportion of their membership during periods of declining business than unions in less stable industries, and will also grow more in times of increasing business. Industries, likewise, differ in the propensity of employees to join unions or in their views as to the need for organization. In the United States, for example, white collar workers stood aloof from trade unionism, and their union membership was until recently quite negligible. In Great Britain, employees whose wages and working conditions are protected by labor legislation, as in the clothing industry, appear to depend more on the law than on membership in a union.

There is, finally, the purely statistical problem of satisfactorily classifying the available figures of membership, for most unions cannot furnish a breakdown of their membership into the available classifications of industry and occupations. For this reason tabulations showing the distribution of membership by industrial groups often exaggerate membership in one group and understate it in another. Several of the American unions of construction employees, notably the Carpenters and Electrical Workers, claim jurisdiction over employees following these trades in manufacturing industries but are unable to classify their membership accordingly. Therefore, total union membership reported for the building trades is too large. The Transport and General Workers' Union in Great Britain covers employees in several industries. Its membership cannot be divided into its components and the total membership "is included in the group with which the majority of its members is believed to be connected."[5] Union membership in the group of transportation and communication in Great Britain is accordingly overstated. On the other hand, there is no counterpart of this union in the United States and the common and unskilled labor that belongs to unions is in this country classified in the industry or occupation in which it works. For such groups as transportation and communication, and agriculture, comparisons of the industrial distribution of British and American membership are, therefore, somewhat misleading.

The concentration of membership in a few groups of unions in Great Britain and the United States is shown for 1935 in Table 4. Five groups of unions accounted for 76 per cent of total British membership and 69 per cent of total American. The groups of unions in transportation and communication lead in both countries, and the unions in mining, quarrying, and oil producing rank third. The differences between the two countries are striking. Building trades unions in the United States

[5] *Ministry of Labour Gazette*, October 1937, p. 380.

TABLE 4

TRADE UNIONS IN GREAT BRITAIN AND THE UNITED STATES, MEMBERSHIP IN THE LARGEST FIVE INDUSTRIAL GROUPS, 1935

GREAT BRITAIN[1]			UNITED STATES		
GROUP	Membership	Percentage of total	GROUP	Membership	Percentage of total
Transportation and communication	1,328,541	27.3	Transportation and communication	726,100	18.7
Public service	723,429	14.9	Building trades	627,200	16.1
Mining, quarrying, and oil	628,836	12.9	Mining, quarrying, and oil	602,300	15.5
Metals, machinery, and vehicles	592,543	12.2	Clothing	427,500	11.0
Textiles	432,387	8.9	Public service	312,900	8.0
Total, above groups	3,705,736	76.1	Total, above groups	2,696,000	69.3
Total, all unions	4,868,226	100.0	Total, all unions	3,888,600	100.0

[1] Including Northern Ireland. Membership figures are from the *Ministry of Labour Gazette*, October 1936.

are the second largest group and include one-sixth of total membership. But in Great Britain this group of unions is not in the first five groups at all. This difference is due to two factors. In both countries the building trades are strongly organized, but in the United States the construction industry is much larger than in Great Britain, and American union membership is consequently greater. In 1935, and also for many years before, unionism in the metal and textile industries was considerably stronger in Great Britain than in this country. The large aggregate membership in these groups of unions in Great Britain has thus reduced the relative position of the building trades unions there, and the small membership of the textile and metal unions in the United States has raised the relative position of unions of building employees here.

These differences in the composition of the British and American labor movements have existed for many years. They are shown in Tables 5 and 6, which give actual union membership in the two countries, classified by industrial groups, and the percentage of total membership in each industrial classification for selected years, 1910-35. In each year the five groups in Great Britain with the largest membership have been transportation and communication; mining, quarrying, and oil; metals, machinery, and vehicles; textiles; and public service. In the United States, on the other hand, the composition of the first five groups has changed radically between 1910 and 1935 with the growth of unions in the clothing industry and among employees in public service, and with the declining importance of unions in the metals, machinery, and vehicle industries since 1920 and in the food, drink, and tobacco industries since 1910. The most striking changes in the American situation were the decline of unionism in the metals, machinery, and vehicle industries and the rise of unionism in clothing and public service. The unions of metal workers reached their peak in 1920 but were at their lowest ebb in the prosperous years of the 1920's when organized labor all but disappeared from the mass production manufacturing industries of this country. At the same time the unions of clothing workers were able to retain an appreciable share of the large gains made during the boom years of the War. In Great Britain, unions in transportation and communication have had since 1920 the largest membership of any group. And in the United States the same group has held first place except in 1929, when the American building trades unions, reflecting the vast expansion in construction and shrinking employment on railroads, displaced the transportation unions. In Great Britain the group of transportation and communication unions has held its position in recent years more securely than in this country, primarily because of the large membership of the Transport and General Workers' Union, whose jurisdiction lies outside the railroad industry.

It is difficult, for reasons already considered, to project this picture into 1937. The British figures are not available beyond 1936 and such American figures as we have are far from reliable. British conditions have probably not changed radically in the last year. If, for lack of better data, we use statistics of membership in 1937 published respectively by the C.I.O. and the A.F. of L. and our own estimates of the membership of independent unions, it is possible to compare the distribution of British membership in 1936 with American in 1937, and thus view the broad changes in American trade unionism since the advent of the C.I.O. and the progress of organization in mass production industries. Membership in the largest five groups of unions in Great Britain in 1936 and in the United States in 1937 is shown in Table 7.

In Great Britain the largest five groups of unions have remained substantially intact, except that unions in the metals, machinery, and vehicle industries have replaced in rank the mining, quarrying, and oil unions. The change is, however, slight and is mainly due to the marked expansion of business in the iron and steel and associated industries of Great Britain in recent years. Among American unions there has been a radical shift in the centers of union strength. Even allowing for the unreliability of the data, unions in the metals, machinery, and vehicle industries for the first time claim a larger membership than the strong unions in transportation and building, and rank first in this list of American unions. Most of this change in the position of the metals group is due to the growth of the steel, automobile, and electrical and radio workers unions, affiliated with the C.I.O., and of the machinists union, affiliated with the A.F. of L. Changes in the composition of the two labor movements are shown for selected years, 1910-37, in Chart 2.

III EXTENT OF ORGANIZATION

Estimates of the strength of organized labor in different countries, or in the same country at different times, are misleading if they rest on membership alone, for a labor movement with a large membership in a small country is obviously stronger than one with the same membership in a larger country. A more accurate index of relative union strength, therefore, is the ratio of membership to population, or better still to that portion of the working population which is organizable into unions. Thus the population of Great Britain, 44,634,000 in 1930, was something more than one-third of the population of the United States, 122,775,046. By this standard, union membership in Great Britain was, in 1930, 10.5 per cent of population, and in the United States, 2.6 per cent.

Deriving similar ratios of the relation of membership to working population, or to that part of the working popu-

TABLE 5.

TRADE UNIONS IN GREAT BRITAIN AND THE UNITED STATES, MEMBERSHIP IN INDUSTRIAL GROUPS, SELECTED YEARS[1]

	GREAT BRITAIN					
INDUSTRIAL GROUP	1910	1920	1922	1929	1933	1935
Agriculture, horticulture, etc.[2]	6,179	210,584	92,831	34,794	30,616	31,474
Mining, quarrying, and oil	740,205	1,157,536	850,405	623,141	563,027	628,836
Building trades	153,374	563,273	389,340	309,816	259,826	274,507
Textiles	384,252	833,831	657,279	594,876	455,413	432,387
Boots and shoes	34,694	99,054	84,256	89,338	88,527	92,054
Clothing	33,049	137,007	81,069	70,141	64,942	74,545
Lumber and woodworking	37,560	86,968	64,693	65,111	51,555	54,369
Paper, printing, and bookbinding	74,242	227,349	186,479	183,682	185,697	194,368
Pottery, glass, and stone	13,646	55,734	40,481	24,917	22,139	19,660
Metals, machinery, and vehicles	371,102	1,171,535	867,698	612,785	518,659	592,543
Food, drink, and tobacco	16,605	35,101	28,631	29,509	29,468	30,098
Transportation and communication	337,920	2,496,235	1,359,454	1,281,784	1,115,501	1,328,541
Railway transport	116,477	617,914	443,363	419,197	381,591	416,437
Water transport	40,531	193,472	101,943	103,444	68,276	72,609
Other transport and general labor, and communication	180,912	1,684,849	814,148	759,143	665,634	839,495
Public service[3]	253,305	670,081	584,146	600,008	650,874	723,429
Entertainment and sports	12,494	51,881	35,824	29,478	20,440	24,387
Commerce and trade	72,023	400,155	217,616	238,949	267,817	295,583
Restaurant and domestic service	0	0	0	0	0	0
Miscellaneous[4]	24,436	150,251	83,511	66,482	62,166	71,445
Total	2,565,086	8,346,575	5,623,713	4,854,811	4,386,667	4,868,226

	UNITED STATES					
INDUSTRIAL GROUP	1910	1920	1922	1929	1933	1935
Agriculture, horticulture, etc.[2]	0	0	1,900	0	600	1,100
Mining, quarrying, and oil	274,900	438,600	386,600	270,800	354,600	602,300
Building trades	459,000	887,900	826,300	919,000	582,700	627,200
Textiles	21,000	149,100	36,900	35,300	16,100	80,300
Boots and shoes	41,700	97,700	82,200	40,400	75,000	103,700
Clothing	97,800	374,500	310,000	218,100	336,100	427,500
Lumber and woodworking	24,000	21,200	11,400	12,700	8,000	10,000
Paper, printing, and bookbinding	89,700	164,000	160,500	162,500	153,100	161,700
Pottery, glass, and stone	59,900	51,400	49,500	37,700	27,100	49,600
Metals, machinery, and vehicles	196,300	858,800	505,800	211,400	179,600	236,600
Food, drink, and tobacco	122,800	180,900	98,800	64,600	57,700	102,200
Transportation and communication	480,500	1,256,100	1,039,000	892,200	609,300	726,100
Railway transport	383,600	963,600	821,700	724,700	490,100	513,100
Water transport	52,800	164,000	120,000	63,500	37,100	60,700
Other transport and general labor, and communication	44,100	128,500	97,300	104,000	82,100	152,300
Public service[3]	58,400	161,400	170,700	246,600	296,300	312,900
Entertainment and sports	60,200	98,600	107,200	135,000	127,300	128,300
Commerce and trade	15,000	20,800	16,700	10,000	5,000	7,200
Restaurant and domestic service	66,400	111,300	121,600	112,200	86,600	133,700
Miscellaneous[4]	72,900	175,500	102,300	74,100	57,900	178,200
Total	2,140,500	5,047,800	4,027,400	3,442,600	2,973,000	3,888,600

[1] British figures are from the *Ministry of Labour Gazette* and the *Abstracts of Labour Statistics of the United Kingdom* and include Northern Ireland. American figures are from Leo Wolman, *Ebb and Flow in Trade Unionism*. They have been reclassified to make them more comparable with the British figures.

[2] A considerable number of agricultural workers in the United Kingdom belong to a general labor union whose membership is included under 'other transport and general labor'. In the United States local unions of agricultural workers are included in the 'miscellaneous' group.

[3] Not elsewhere classified.

[4] Includes workers in chemicals, leather, rubber, brushes, musical instruments, etc.; also clerks, foremen, professional workers, etc., when not classified by industry.

TABLE 6

TRADE UNIONS IN GREAT BRITAIN AND THE UNITED STATES, PERCENTAGES OF TOTAL MEMBERSHIP IN INDUSTRIAL GROUPS, SELECTED YEARS

INDUSTRIAL GROUP	GREAT BRITAIN[1]						UNITED STATES					
	1910	1920	1922	1929	1933	1935	1910	1920	1922	1929	1933	1935
Agriculture, horticulture, etc.	0.2	2.5	1.7	0.7	0.7	0.6	0.0	0.0	0.1	0.0	.....[2]	....[2]
Mining, quarrying, and oil	28.9	13.9	15.1	12.8	12.8	12.9	12.8	8.7	9.6	7.9	11.9	15.5
Building trades	6.0	6.8	6.9	6.4	5.9	5.6	21.4	17.6	20.5	26.7	19.6	16.1
Textiles	15.0	10.0	11.7	12.3	10.4	8.9	1.0	3.0	0.9	1.0	0.5	2.1
Boots and shoes	1.3	1.2	1.5	1.8	2.0	1.9	2.0	1.9	2.0	1.2	2.5	2.7
Clothing	1.3	1.6	1.4	1.5	1.5	1.5	4.6	7.4	7.7	6.3	11.3	11.0
Lumber and woodworking	1.5	1.1	1.2	1.3	1.2	1.1	1.1	0.4	0.3	0.4	0.3	0.3
Paper, printing and bookbinding	2.9	2.7	3.3	3.8	4.2	4.0	4.2	3.2	4.0	4.7	5.2	4.2
Pottery, glass and stone	0.5	0.7	0.7	0.5	0.5	0.4	2.8	1.0	1.2	1.1	0.9	1.3
Metals, machinery and vehicles	14.5	14.0	15.4	12.6	11.8	12.2	9.2	17.0	12.6	6.1	6.0	6.1
Food, drink and tobacco	0.6	0.4	0.5	0.6	0.7	0.6	5.7	3.6	2.5	1.9	1.9	2.6
Transportation and communication	13.2	29.9	24.2	26.4	25.4	27.3	22.5	24.9	25.8	25.9	20.5	18.7
Railway transport	4.5	7.4	7.9	8.6	8.7	8.6	17.9	19.1	20.4	21.1	16.5	13.2
Water transport	1.6	2.3	1.8	2.1	1.6	1.5	2.5	3.2	3.0	1.8	1.2	1.6
Other transport and general labor, and communication	7.1	20.2	14.5	15.6	15.2	17.2	2.1	2.6	2.4	3.0	2.8	3.9
Public service	9.9	8.0	10.4	12.4	14.9	14.9	2.7	3.2	4.2	7.2	10.0	8.0
Entertainment and sports	0.5	0.6	0.6	0.6	0.5	0.5	2.8	2.0	2.7	3.9	4.3	3.3
Commerce and trade	2.8	4.8	3.9	4.9	6.1	6.1	0.7	0.4	0.4	0.3	0.2	0.2
Restaurant and domestic service	0.0	0.0	0.0	0.0	0.0	0.0	3.1	2.2	3.0	3.3	2.9	3.4
Miscellaneous	0.9	1.8	1.5	1.4	1.4	1.5	3.4	3.5	2.5	2.1	2.0	4.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Including Northern Ireland.

[2] Less than one-tenth of one per cent.

lation which is eligible to membership, raises many difficulties. Comparable data are usually not available for the same dates. Definitions and methods of collecting data vary considerably from one country to another. Trade union practice and prevailing conceptions of organizability are, likewise, not everywhere the same and from time to time change even within one country, as they have recently in the United States. Under the circumstances, comparisons of the extent of union organization, measured in this way, are far from precise and do no more than suggest differences in general orders of magnitude.

Probably the simplest index of the relative extent of labor organization is the ratio of membership to the gainfully occupied population. Both Great Britain and the United States take a census of occupations every ten years. Although these counts differ in many details and are not made for the same years, they yield data broadly comparable for the present purpose. Union membership and population gainfully occupied in Great Britain and the United States are given in Table 8. The British population figures are for the census years, 1911, 1921, and 1931, and the American for 1910, 1920, and 1930. To avoid some of the fortuitous effects of these differences in the census year, British union membership is given for 1910, 1920, and 1930 as well as for 1911, 1921, and 1931, and the percentages of occupied population in trade unions are computed from both sets of membership figures. In either case, union membership in Great Britain is found

TABLE 7

TRADE UNIONS IN GREAT BRITAIN, 1936, AND IN THE UNITED STATES, 1937

MEMBERSHIP IN THE LARGEST FIVE INDUSTRIAL GROUPS

GREAT BRITAIN, 1936[1]			UNITED STATES, 1937		
GROUP	Membership	Percentage of total	GROUP	Membership	Percentage of total
Transportation and communication	1,504,885	28.4	Metals, machinery, and vehicles	1,322,800	19.7
Public service	764,719	14.4	Transportation and communication	1,080,300	16.0
Metals, machinery, and vehicles	686,044	12.9	Building trades	836,500	12.4
Mining, quarrying, and oil	678,974	12.8	Mining, quarrying, and oil	732,000	10.9
Textiles	429,050	8.1	Clothing	522,100	7.8
Total, above groups	4,063,672	76.6	Total, above groups	4,493,700	66.8

[1] Including Northern Ireland. Membership figures are from the *Ministry of Labour Gazette*, October 1937.

to be proportionately more than three times larger than in the United States.

The unreliability of recent estimates of American union membership, and the fact that the next census of occupations will not be taken in Great Britain until 1941 and in the United States until 1940, make it difficult to extend these figures beyond 1931 and 1930. But on the basis of the reported increase in the number of members of both British and American unions since 1930 and rough estimates of the gainfully occupied population in recent years, the percentage of the occupied population belonging to unions in 1937 may be estimated as slightly in excess of 25 in Great Britain and of 12 in the United States.

Quite similar results would be obtained if union membership in each of these countries were compared with that part of the gainfully occupied population which can be described as the wage earning and lower salaried classes, exclusive of agricultural labor. It has been estimated that the number of such employees in the United States in 1930 was roughly 30 million.[6] In Great Britain in the census year 1931 the number of employees answering the same description would appear to be approximately 15 million. The percentage of non-agricultural employees who were members of unions in the United States in 1930 was, therefore, 10.6, and in Great Britain in 1931, 30.0

Among employees attached to the principal divisions of industry in the United States and in Great Britain there is naturally a striking diversity in the extent of trade unionism. The percentage of workers organized, by broad industrial and occupational categories, is shown for census years since 1920 in Table 9 and in Appendix Table I. All industries and occupations, barring the relatively unimportant group of recreation and amusement, were much more thoroughly organized in Great Britain than in this country. The British unions were relatively two to three times stronger in practically every group. Among school teachers, organization in the United States was negligible but in Great Britain it covered approximately three-fourths of those attached to this occupation. Coal mining had the highest percentage of organization in Great Britain and

[6] Leo Wolman, *op. cit.*, p. 116.

Chart 2

TRADE UNIONS IN THE UNITED STATES AND GREAT BRITAIN

MEMBERSHIP BY INDUSTRIAL GROUPS SELECTED YEARS

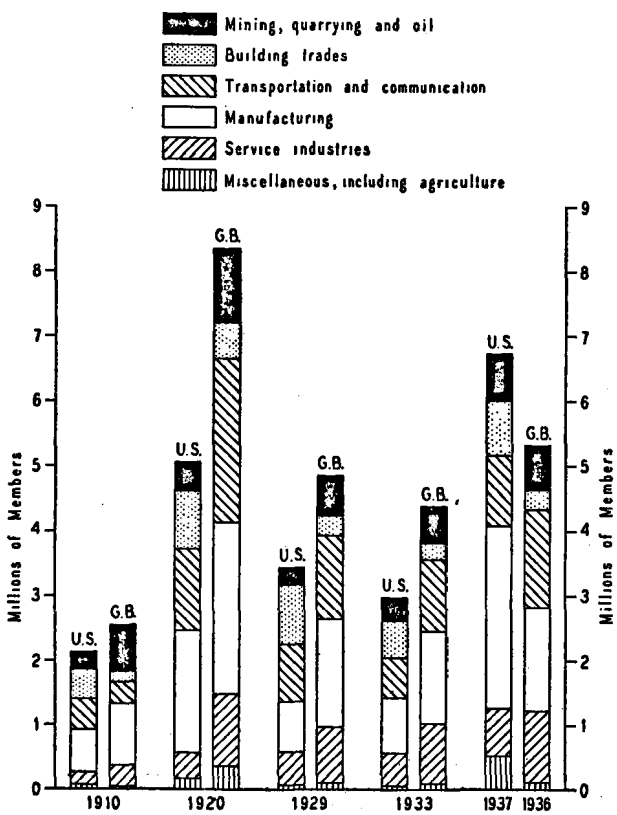


TABLE 8

TOTAL TRADE UNION MEMBERSHIP, TOTAL OCCUPIED POPULATION AND PERCENTAGE OF TRADE UNION ORGANIZATION GREAT BRITAIN AND THE UNITED STATES, CENSUS YEARS

YEAR	GREAT BRITAIN[1]	YEAR	UNITED STATES[2]
	TOTAL OCCUPIED POPULATION		
1911	18,354,000	1910	38,167,000
1921	19,357,000	1920	41,614,000
1931	21,055,000	1930	48,830,000
	TOTAL TRADE UNION MEMBERSHIP		
1910	2,541,000	1910	2,101,500
1920	8,276,000	1920	4,881,200
1930	4,709,000	1930	3,189,500
	PERCENTAGE OF OCCUPIED POPULATION IN TRADE UNIONS		
1910	13.8[3]	1910	5.5
1920	42.8[3]	1920	11.7
1930	22.4[3]	1930	6.5

[1] England, Scotland, and Wales only; membership of unions in Northern Ireland and in the Irish Free State, and of oversea branches of British unions has been deducted.

[2] Figures for American unions exclude their membership in Canada.

[3] The British census years are 1911, 1921, and 1931. We present, however, percentages for 1910, 1920, and 1930 based on comparisons of union membership in 1910, 1920, and 1930 with the working population in 1911, 1921, and 1931, respectively, on the assumption that the size of the working population did not change materially between 1910 and 1911, 1920 and 1921, and 1930 and 1931. The figures for the census years are as follows:

Year	Total trade union membership	Percentage of occupied population in trade unions
1911	3,110,000	16.9
1921	6,561,000	33.9
1931	4,497,000	21.4

TABLE 9

PRINCIPAL DIVISIONS OF INDUSTRY
PERCENTAGE OF TRADE UNION ORGANIZATION AMONG EMPLOYEES
GREAT BRITAIN AND THE UNITED STATES, CENSUS YEARS[1]

DIVISION OF INDUSTRY	GREAT BRITAIN				UNITED STATES	
	1920	1930	1921	1931	1920	1930
Mining, quarrying, and oil production	95.6	56.1	80.6	52.0	39.6	22.4
Coal mining	98.2	59.0	82.5	55.0	50.9	33.0
Other mining, quarrying, and oil	56.8	20.6	52.4	13.3	13.7	2.4
Manufacturing and mechanical industries, incl. construction	55.5	32.1	47.5	30.6	22.2	12.2
Transportation and communication[2]	77.8	50.8	61.5	46.5	37.1	20.2
Service industries						
Clerical and commercial service	20.1	9.3	13.3	9.7	5.6	3.2
Recreation and amusement	69.9	26.7	60.2	22.8	50.5	35.8
Teaching (school)	70.8	77.8	71.8	77.8	1.1	0.5

[1] See Appendix Table I for the figures on which these percentages are based.

[2] Exclusive of shop craft and clerical workers. These may be found under manufacturing industry and clerical service, respectively.

was also highly organized in the United States. From 1920 to 1930 both labor movements suffered a severe decline in membership and consequently, in position. Thus, in 1930, 69 per cent of the employees in the important and largest category of all—the manufacturing, mechanical, and construction industries—were unorganized in Great Britain, and 88 per cent were unorganized in the United States.

To obtain comparisons between union membership and the number of employees more frequently than once in ten years is possible only for a few classes of employment, since there is no current equivalent of the decennial census of occupations in either Great Britain or the United States. For coal mining and steam railroad transportation there are annual figures of employment for both countries. The biennial Census of Manufactures in the United States gives the average number employed in factory industries in odd years, and the British Census of Production affords analogous figures for 1924 and 1930. The percentage of employees in trade unions in manufacturing, coal mining, and steam railroad transportation is shown for various years, 1923-35, in Table 10 and the detailed figures on which these percentages are based are given in Appendix Tables II-IV.

In all the years for which there is a record, coal miners and railroad employees were in both countries more completely organized than factory labor. British industries were more thoroughly unionized than American, but the difference was greatest in manufacturing. Since 1933 the extent of organization seems to be rising in both countries, and the increase in the membership of the coal miners union in this country has been so great that the percentage of coal miners organized reached 93.9 in 1935, and in 1934 exceeded the percentage in Great Britain for the first time. Figures of union membership in Great Britain in 1936 and in the United States in 1937, cited above, indicate that the percentage organized has risen considerably since 1935, particularly among factory employees in this country.

The large division of manufacturing industry, which in 1935 covered 7,378,000 employees in the United States,

TABLE 10

MANUFACTURING, COAL MINING, AND STEAM RAILROAD TRANSPORTATION, PERCENTAGE OF TRADE UNION ORGANIZATION AMONG EMPLOYED WORKERS, GREAT BRITAIN AND THE UNITED STATES, 1923-1935[1]

YEAR	MANUFACTURING[2]		COAL MINING		STEAM RAILROAD TRANSPORTATION[3]	
	Great Britain	United States	Great Britain	United States	Great Britain	United States
1923		12.7	75.7	57.1	70.2	44.7
1924	38.8[4]		79.1	58.9	72.3	45.6
1925		12.4	81.7	55.4	75.3	45.2
1926			69.5	47.6	71.4	43.2
1927		12.1	64.8	49.0	60.5	43.5
1928			64.3	45.3	60.8	45.2
1929		10.9	64.4	37.4	65.3	44.6
1930	35.1[4]		64.9	31.8	68.3	49.0
1931		14.1	65.1	48.2	65.9	51.2
1932			68.9	64.9	66.7	56.3
1933		16.2	71.6	61.5	67.4	51.0
1934			74.7	90.6	69.3	49.7
1935		17.6	82.8	93.9	71.7	53.2

[1] For the figures on which these percentages are based see Appendix Tables II, III, and IV.

[2] Figures for the United States include workers in shop crafts on railroads; figures for Great Britain include them only when they are employed by private contractors or manufacturers, not by the railroads directly.

[3] Figures for the United States exclude workers in shop crafts and on street railways; figures for Great Britain include shop craft workers, supervisors and officials, and workers in ancillary businesses connected with steam railroads. They include also street railway workers.

[4] See Appendix Table IV, footnote 1.

and in 1930, 4,286,000 in Great Britain, is composed of a great variety of industries. These industries differ in size, the composition of their work-force, their profitability, their wages and working conditions and also in the state of union organization among their employees. The extent of the variation is shown in Table 11 which gives, in each census year, 1923-35, the percentage of employees organized among important subdivisions of manufacturing industry. Once more the British industries are generally more completely organized than the American. The two largest classes of industry—metals, machinery, and vehicle, and textile—were approximately half union in Great Britain, and less than 15 and 10 per cent, respectively, in the United States. Of the industries listed in Table 11 only three—clothing, clay, glass, and stone, and food products—had higher percentages of organization in this country. The most striking difference is in the clothing industry whose relative organization in America is three times that of Great Britain. The advances made by organized labor in the United States under the influence of legislation and C.I.O. activities have radically affected the relative position of unionism in manufacturing industries since 1935. Allowing for considerable and indeterminate margins of error in estimating the membership of American trade unions in 1937, it is safe to say that the percentage of organization in the American metal, machinery, and vehicle, and textile industries is now much closer to the British figure.

TABLE 11

MANUFACTURING INDUSTRIES, PERCENTAGE OF TRADE UNION ORGANIZATION AMONG EMPLOYED WAGE EARNERS GREAT BRITAIN AND THE UNITED STATES, 1923-1935[1]

	GREAT BRITAIN		UNITED STATES						
DIVISION OF MANUFACTURING INDUSTRY	1924	1930	1923	1925	1927	1929	1931	1933	1935
Clothing	25.0	20.8	54.6	55.8	47.1	35.5	41.8	65.6	67.3
Paper, printing, and bookbinding	66.9	58.4	26.7	26.8	27.1	25.2	29.6	30.8	28.6
Boots and shoes	72.9	80.5	20.2	23.7	22.3	19.1	17.6	38.3	50.6
Clay, glass, and stone products	16.1	12.8	14.3	12.6	12.9	13.2	17.9	18.8	20.9
Metals and their manufactures[2]	49.9	41.3	10.5	9.6	9.6	8.8	12.1	12.8	12.0
Lumber products and woodworking	53.8	42.4	8.9	9.1	10.0	9.9	15.8	12.2	9.5
Food, drink, and tobacco products	7.3	7.6	9.2	9.3	8.6	7.4	7.9	7.5	11.3
Textile mill products	51.5	56.1	3.1	3.3	3.2	3.3	3.9	1.7	7.8
All other products	7.9	6.3	4.9	4.0	4.1	4.6	6.0	5.9	5.9
All manufacturing industries	38.8[3]	35.1[3]	12.7	12.4	12.1	10.9	14.1	16.2	17.6

[1] For the figures from which these percentages are derived, see Appendix Table IV.

[2] Including iron and steel and their products, non-ferrous metals and their products, machinery and transportation equipment. Figures for the United States cover shop craft workers on steam railroads. Figures for Great Britain cover only such railroad repair work as is performed by private contractors or manufacturers, not by the railroads directly.

[3] See Appendix Table IV, footnote 1.

IV SUMMARY AND CONCLUSIONS

In the history of their development since 1890 the British and American organized labor movements have had many common experiences. Union membership in both countries increased steadily, with relatively few and slight setbacks, from the middle '90's to 1920. In that year both the British and the American unions profiting from the War boom of business and employment and the friendly policy of government, achieved a membership roughly double its pre-War size. The depression of 1921 caused a huge decline in membership. Contrary to experience, the expected rise in membership following the turn in business in 1922 failed to materialize in either country. Instead, the decline continued throughout most of the 1920's and was accelerated again during the depression of 1930-33. Altogether the British unions lost 4,000,000, and the American, 2,000,000 members from the peak in 1920 to the trough in 1933. With the next upturn in business, in 1932-33, the long period of decline appears to have come to an end. By 1936 the British unions had 900,000 more members than in 1933; by 1937 the American claimed 4,000,000 more.

Throughout most of the long period, 1897-1935, union membership in Great Britain was substantially larger than in the United States. Not counting the earliest years of this period, when organized labor in this country was recovering from internal warfare and the depression of 1893, and the A.F. of L. was just getting on its feet, the British unions began to draw away from the American about 1906 and were not overtaken again until 1937. In 1920 the British unions claimed 8,348,000 members, the American only 5,047,800; even in 1935 British membership exceeded American by approximately 1,000,000. Since 1935 a kaleidoscopic succession of events has so transformed the American labor movement that its membership began to climb at an exceptional rate and the unions claim a gain in two years of about 3,500,000 members.

This rate of advance the British unions have been unable to equal. Even if they have gained as many members in 1936-37 as they did in 1935-36, or 500,000, their membership in the latest year would remain more than a million less than that claimed by the American unions.

Relative to the size of the total population, or to the number of wage earners and salaried employees, the British unions have been substantially the stronger. It may be roughly estimated that the relative numerical strength of organized labor in Great Britain has for many years been triple that in this country. The disparity is less in 1937 than before, but the advantage still lies with the British movement.

Another striking difference between the two labor move-

APPENDIX TABLE I

PRINCIPAL DIVISIONS OF INDUSTRY, EXTENT OF TRADE UNION ORGANIZATION AMONG EMPLOYEES GREAT BRITAIN AND THE UNITED STATES, CENSUS YEARS[1]

	GREAT BRITAIN				UNITED STATES	
	1920[2]	1930[2]	1921	1931	1920	1930
Mining, quarrying, and oil production						
Number of employees	.....	.....	1,210,662	1,086,759	1,055,898	953,427
Union membership	1,157,536	610,101	976,184	564,935	418,000	213,100
Percentage organized	95.6	56.1	80.6	52.0	39.6	22.4
Coal mining						
Number of employees	.....	.....	1,135,150	1,007,102	733,936	621,661
Union membership	1,114,659	593,713	936,653	554,373	373,800	205,100
Percentage organized	98.2	59.0	82.5	55.0	50.9	33.0
Other mining, quarrying, and oil						
Number of employees	.....	.....	75,512	79,657	321,962	331,766
Union membership	42,877	16,388	39,531	10,562	44,200	8,000
Percentage organized	56.8	20.6	52.4	13.3	13.7	2.4
Manufacturing and mechanical industries, incl. construction						
Number of employees	.....	.....	5,867,223	6,084,109	12,140,420	13,517,512
Union membership	3,258,620	1,952,230	2,787,673	1,864,210	2,699,000	1,640,800
Percentage organized	55.5	32.1	47.5	30.6	22.2	12.2
Transportation and communication[3]						
Number of employees	.....	.....	1,517,210	1,671,335	2,870,398	3,505,253
Union membership	1,180,584	848,602	933,223	776,675	1,065,900	709,700
Percentage organized	77.8	50.8	61.5	46.5	37.1	20.2
Service industries						
Clerical and commercial service[4]						
Number of employees	.....	.....	2,426,996	3,277,118	4,766,150	6,579,315
Union membership	487,209	303,418	321,645	316,512	265,200	207,900
Percentage organized	20.1	9.3	13.3	9.7	5.6	3.2
Recreation and amusement						
Number of employees	.....	.....	74,258	98,833	204,111	355,803
Union membership	51,881	26,350	44,668	22,507	103,100	127,300
Percentage organized	69.9	26.7	60.2	22.8	50.5	35.8
Teaching (school)						
Number of employees	.....	.....	282,500	294,795	752,055	1,044,016
Union membership	199,923	229,393	202,854	229,242	8,600	5,200
Percentage organized	70.8	77.8	71.8	77.8	1.1	0.5

[1] Figures for the United States compiled from Leo Wolman, *Ebb and Flow in Trade Unionism*, pp. 200, 217-21. Percentages of trade union organization in both countries are based on compilations from the respective Censuses of Occupations of the number of employees, excluding employers, managers, and officials. The Census of Occupations for the United States covered, in each year, all workers aged 10 years or over; the corresponding age limit for the British Census was 12 years in 1921 and 14 in 1931.

Union membership figures for the United States are exclusive of Canada. Figures for union membership in Great Britain include membership in Northern Ireland and in oversea branches, although the figures for the number of employees cover only England, Scotland, and Wales. The error thus introduced, however, is very slight.

[2] The British census years are 1921 and 1931. We present, however, percentages for 1920 and 1930 based on comparisons of union membership in 1920 and 1930 with the working population in 1921 and 1931, respectively, on the assumption that the size of the working population did not change materially between 1920 and 1921, and between 1930 and 1931.

[3] Exclusive of shop craft and clerical workers. These may be found under manufacturing industry and clerical service, respectively. The membership of general labor unions has been deducted from the British membership figures.

[4] Includes railway clerks.

ments has been in the dispersion of membership and organization. In the United States, except for trades such as teamsters, only four industries—transportation, building, coal mining, and clothing—were highly organized until very recently. In Great Britain, although railroad, building, and coal mining labor was among the most completely organized, there was a high percentage of union membership in the textile and metal and allied industries, among public servants, and among common laborers, with fairly substantial organization also among clerical workers and sales people. It was only after 1935, when the organizing campaigns of the C.I.O. in the so-called mass production industries began to be crowned with success, and both the C.I.O. and the A.F. of L. directed their activities toward organizing retail stores, hotels, and restaurants, and the employees of local and central governments, that American unionism in these occupations and industries aspired to the heights long before reached in Great Britain.

Concerning the causes of these very substantial differences in the development of organized labor in Great Britain and the United States, there are many hypotheses and explanations. The heterogeneity of the population, the wide geographical dispersion of industry and labor, the existence of independent unionism in the form of company unions, the state of the labor law, the structure of unions, the relatively higher wages, and the opposition of employers to organized labor are all factors in the American situation that help to explain the course trade unions have followed in this country and their present condition.

Of these factors, one of the most influential has been the size of the country, the far-flung dispersion of shops and factories, and the very high mobility of American industry. The territory to be covered in organizing employees is so vast that the cost of organizing has always been formidable, and at times prohibitive. Organizing campaigns, therefore, must be undertaken by unions that already have adequate reserve funds and whose members are willing to be taxed for the prosecution of further organizing activities. Added to this initial cost of organizing is the expense of continuously widening the area of unionizing campaigns to gather new industries into the fold as well as employers who have moved their plants, whether to procure tax exemption, to gain the benefits of a changing localization of industry, or to escape dealing with organized labor.

Closely associated with the mobility of American industry and the unwillingness of the majority of American employers to bargain with trade unions has been the development of plant or shop unions. While not unknown in Great Britain, they are much rarer than here. In this country they have proved an effective obstacle in the path of trade unionism, partly because they were sponsored by the employer and hence had his support, and partly because they met many genuine needs of the employees. Un-

APPENDIX TABLE II

COAL MINING, EXTENT OF TRADE UNION ORGANIZATION AMONG EMPLOYED WAGE EARNERS
GREAT BRITAIN AND THE UNITED STATES, 1923-1935

	GREAT BRITAIN[1]			UNITED STATES[2]		
YEAR	Number employed[3]	Union membership[4]	Percentage organized	Number employed	Union membership	Percentage organized
1923	1,181,844	894,824	75.7	862,536	492,900	57.1
1924	1,192,144	942,485	79.1	779,613	459,100	58.9
1925	1,083,785	885,789	81.7	748,805	414,700	55.4
1926	1,096,948[5]	762,916	69.5	759,033	361,100	47.6
1927	1,005,053	651,554	64.8	759,177	372,300	49.0
1928	921,260	592,379	64.3	682,831	309,400	45.3
1929	939,367	605,361	64.4	654,494	245,100	37.4
1930	914,328	593,713	64.9	644,006	205,100	31.8
1931	851,623	554,373	65.1	589,644	284,200	48.2
1932	803,615	553,959	68.9	527,623	342,300	64.9
1933	773,640	553,631	71.6	523,336	321,800	61.5
1934	772,847	577,190	74.7	567,061	513,800	90.6
1935	754,321	624,929	82.8	565,672	531,000	93.9

[1] Including Northern Ireland.

[2] Membership figures for 1923 to 1934 from Leo Wolman, *Ebb and Flow in Trade Unionism*, p. 229. Employment figures are from the U. S. Bureau of Mines, *Mineral Resources of the United States.*

[3] Figures reported in the *Statistical Abstract for the United Kingdom*, 80th number, 1937, pp. 298-9 are compiled from the Annual *Reports* of the Mines Department and from information supplied by the Mines Department and by the Government of Northern Ireland.

[4] *Ministry of Labour Gazette*, October of each year.

[5] The figures for England, Scotland, and Wales are for March 13, since the majority of coal mines were idle during a considerable period of the year owing to a protracted dispute. The total number employed on December 11, 1926 was 943,605.

til a few years ago, this type of association had probably as many members as the organized labor movement. Since 1933 their rights have been progressively restricted and many of their practices, such as receiving financial assistance from employers, are now forbidden by law. A fair number have changed their form and continue to exist in many industries. Their future is uncertain, depending, as does the whole course of labor relations in this country, on the stability of the present organized labor movement.

Probably the most potent change in the status of American unions since 1933 has been the rewriting of the laws governing trade unions. In the history of the legal position of unions in Great Britain and the United States there has been a slow but substantial liberalization of the law. Most of the disabilities from which unions suffered in their early periods have been removed and most of the practices of organized labor sanctioned. In the opinion of many students of labor in the United States, the existing law and the judicial interpretation of it had failed in practice to afford employees and their unions the guarantees they needed in order to exercise the right to combine in unions and to bargain collectively with employers through representatives of their own free choice. The National Labor Relations Act, signed by the President July 5, 1935 was designed to remedy the defects in existing statutes. Its effect has, no doubt, been to stimulate organization and to break down the resistance of employers to dealing with organized labor.

Union structure, which has played so large a role in the labor controversies of this country, does not appear to have been an equally serious factor in Great Britain. In many of the highly organized industries of that country, employees belong to either craft or semi-industrial unions which join together for purposes of common action into loose federations, much after the fashion of the unions of train service, shop craft, and maintenance of way employees on the American railroads. In Great Britain, also, two large unions—the Transport and General Workers' Union and the National Union of General and Municipal Workers—with a combined membership in 1935 of nearly 800,000, draw their members from a variety of industries. They have nevertheless apparently avoided the disastrous consequences of warfare over conflicting jurisdictional claims. Thus a combination of craft, semi-industrial, and separate unions of unskilled and common labor has succeeded in achieving and preserving a high percentage of unionization in many British industries, while at the same time preserving the autonomy of workers organized in craft unions. It remains to be seen whether the purely industrial, or vertical union, will prevail in the United States or whether arrangements like the British will in time be more generally adopted in American industry.

APPENDIX TABLE III

STEAM RAILWAYS, EXTENT OF TRADE UNION ORGANIZATION AMONG EMPLOYED WAGE EARNERS
GREAT BRITAIN AND THE UNITED STATES, 1923-1935

	GREAT BRITAIN			UNITED STATES[1]		
YEAR	Number employed[2]	Union membership[3]	Percentage organized	Number employed	Union membership	Percentage organized
1923	681,778	478,492	70.2	1,335,399	596,600	44.7
1924	700,573	506,854	72.3	1,285,226	586,300	45.6
1925	702,062	528,764	75.3	1,288,333	582,700	45.2
1926	689,264	491,861	71.4	1,330,532	575,300	43.2
1927	683,077	413,319	60.5	1,311,862	571,200	43.5
1928	677,148	412,037	60.8	1,256,331	567,300	45.2
1929	642,137	419,197	65.3	1,265,613	564,600	44.6
1930	656,530	448,362	68.3	1,135,993	557,000	49.0
1931	615,592	405,741	65.9	959,495	491,300	51.2
1932	597,971	399,084	66.7	786,178	442,700	56.3
1933	566,300	381,591	67.4	741,020	377,800	51.0
1934	575,048	398,393	69.3	765,270	380,600	49.7
1935	580,766	416,437	71.7	756,093	402,300	53.2

[1] Figures for 1923-34 from Leo Wolman, *Ebb and Flow in Trade Unionism*, pp. 230-1. Figures for 1935 are derived in the same way as in this volume. The number employed excludes workers on street railways and in maintenance of equipment and stores on steam railways. It also excludes executives, officials, and staff assistants on steam railways.

[2] Figures for 1923 and 1924 from *21st Abstract of Labour Statistics of the United Kingdom*, p. 22. Data for 1925-35 from Ministry of Transport report on *Railways (Staff)*. The particulars in this report relate to all staff employed by the railway companies of Great Britain (excluding the Manchester Ship Canal); staff employed by the London Passenger Transport Board in connection with their railways (street railways); all staff employed by the Railway Clearing House.

Employees of railways in Northern Ireland are not included, since data are not available after 1925.

[3] *Ministry of Labour Gazette*, October of each year. Includes only those union members classified in the 'railway service' group. Union membership in Northern Ireland is included.

Appendix Table IV

Manufacturing Industries, Extent of Trade Union Organization among Employed Wage Earners Great Britain and the United States, 1923-1935

Division of Manufacturing Industry	Great Britain[1]		United States[2]						
	1924	1930	1923	1925	1927	1929	1931	1933	1935
Clothing									
Number of wage earners	309,243	331,592	537,727	505,468	545,108	579,427	508,136	496,330	615,816
Union membership	77,409	68,948	293,800	282,300	256,600	205,800	212,600	325,500	414,200
Percentage organized	25.0	20.8	54.6	55.8	47.1	35.5	41.8	65.6	67.3
Paper, printing, and publishing									
Number of wage earners	290,292	319,845	527,019	536,766	553,040	591,381	511,350	460,486	540,507
Union membership	194,218	186,744	140,600	144,000	150,100	149,100	151,200	142,000	154,600
Percentage organized	66.9	58.4	26.7	26.8	27.1	25.2	29.6	30.8	28.6
Boots and shoes									
Number of wage earners	120,934	112,602	225,216	206,992	203,110	205,640	181,374	190,914	202,113
Union membership	88,193	90,591	45,400	49,000	45,300	39,300	31,900	73,200	102,300
Percentage organized	72.9	80.5	20.2	23.7	22.3	19.1	17.6	38.3	50.6
Clay, glass, and stone									
Number of wage earners	192,999	205,864	351,692	353,036	350,017	328,417	222,856	173,000	233,205
Union membership	31,061	26,248	50,300	44,600	45,200	43,200	40,000	32,600	48,800
Percentage organized	16.1	12.8	14.3	12.6	12.9	13.2	17.9	18.8	20.9
Metals and their manufactures[3]									
Number of wage earners	1,408,777	1,454,853	3,227,036	3,002,738	2,916,050	3,268,403	2,183,435	1,830,220	2,417,739
Union membership	703,358	600,603	337,900	289,100	279,300	288,600	264,600	233,800	290,300
Percentage organized	49.9	41.3	10.5	9.6	9.6	8.8	12.1	12.8	12.0
Lumber and woodworking									
Number of wage earners	122,892	149,326	931,816	921,266	862,667	876,383	509,665	454,171	579,012
Union membership	66,157	63,326	83,200	83,800	86,500	86,600	80,500	55,300	55,000
Percentage organized	53.8	42.4	8.9	9.1	10.0	9.9	15.8	12.2	9.5
Food, drink, and tobacco									
Number of wage earners	369,596	389,283	817,317	795,902	793,248	852,380	735,128	753,562	887,985
Union membership	27,013	29,742	75,000	73,900	68,500	63,200	58,200	56,700	100,600
Percentage organized	7.3	7.6	9.2	9.3	8.6	7.4	7.9	7.5	11.3
Textile mill products									
Number of wage earners	1,198,203	997,282	1,145,966	1,093,199	1,101,724	1,077,596	870,642	938,798	1,027,200
Union membership	617,093	559,700	35,000	36,200	35,100	35,200	34,000	16,000	80,300
Percentage organized	51.5	56.1	3.1	3.3	3.2	3.3	3.9	1.7	7.8
All other products[4]									
Number of wage earners	332,063	325,738	996,802	961,331	1,000,805	1,031,346	784,115	758,255	875,268
Union membership	26,219	20,426	48,800	38,600	41,500	47,500	46,900	44,700	51,700
Percentage organized	7.9	6.3	4.9	4.0	4.1	4.6	6.0	5.9	5.9
All manufacturing industries									
Number of wage earners	4,344,999	4,286,385	8,760,591	8,376,698	8,325,769	8,811,243	6,506,701	6,055,736	7,378,845
Union membership	1,830,721	1,646,328	1,110,000	1,041,500	1,007,300	958,500	919,900	979,800	1,297,800
Percentage organized	42.1	38.4	12.7	12.4	12.1	10.9	14.1	16.2	17.6

[1] Including Northern Ireland. Membership figures compiled from data published in the *Ministry of Labour Gazette,* October of each year. Figures for number of workers are from the *Fourth Census of Production of the United Kingdom, 1930,* Parts I and V, and are the number reported as 'operatives'. Operatives are defined as including "all wage earners employed in or about the works (including foremen, van and lorry drivers and warehousemen) or in outside work of construction and repair" (see Part V, p. 85). Outworkers are excluded. Data refer only to firms that employed more than ten (five for Northern Ireland) persons on the average during the census years. If the number estimated to have been employed by the small firms and by firms from whom no information was received are included, the figures for 'all manufacturing industries' become:

	1924	1930
Total number of operatives	4,716,000	4,692,300
Total union membership	1,830,721	1,646,328
Percentage organized	38.8	35.1

[2] Figures for 1923-33, adjusted to make them comparable with similar data for Great Britain, from Leo Wolman, *Ebb and Flow in Trade Unionism,* pp. 224-27. Revisions have also been made in the 1933 employment figures given there in order to make them comparable with the figures for 1935. Canadian union membership has been deducted in all years.

[3] Including iron and steel and their products, non-ferrous metals and their products, machinery and transportation equipment. Figures for the United States cover shop craft work on steam railroads. Figures for Great Britain cover only such railroad repair work as is performed by private contractors or manufacturers, not by the railroads directly.

[4] Includes leather, chemicals, rubber products, musical instruments, and brushes.

National Bureau of Economic Research

BULLETIN 69

MAY 28, 1938

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Statistical Indicators of Cyclical Revivals

WESLEY C. MITCHELL and ARTHUR F. BURNS

Copyright 1938, National Bureau of Economic Research, Inc.

I. THE AIMS OF THIS BULLETIN

THIS bulletin rests upon an analysis of the timing of cyclical revivals in the United States of 487 statistical series in monthly or quarterly form, of which many cover the post-War period alone, while a few run back to the 1880's or earlier. What we have to offer is a digest of past experience, which we take to be on the whole the best teacher of what to expect in the near future.[1]

But one of the clearest teachings of experience is that every business cycle has features that are peculiar to it. Accordingly, no one who knows the past expects that what happened during any earlier business revival will repeat itself exactly during the next revival. Even average experience over several revivals establishes no more than a presumption concerning the general character of the developments that may be anticipated when next the business tide begins to rise. Whatever judgments are formed ought to be based, not upon the behavior of one or two indexes of business conditions, but upon the behavior of a considerable number of statistical series that represent a wide variety of economic processes, and upon a careful study of the salient factors that are influencing current business policies.

Hence we have drawn up a list of statistical series differing widely in other respects but alike in that each has proved in the past to be a fairly consistent indicator of cyclical movements in general business. We regard this list not as a 'forecasting' machine, but rather as a registering device that may be useful to those who are trying to interpret the general drift of current fluctuations in different types of business activity.

Unfortunately the list is rather cumbersome to use. It is not an automatic guide, but requires the exercise of judgment. Also we must burden the reader with technical explanations about the way in which the results were obtained and the precautions to be taken in interpreting them.[2] But it is wiser to face frankly the real complexities and uncertainties that attend upon all efforts to determine when a cyclical revival is getting under way than to indulge in simplifications that may prove treacherous.

II. THE DATING OF CYCLICAL REVIVALS AND RECESSIONS

Before we can determine what series have been reliable indicators of cyclical revivals and recessions, we must determine when these turns in the tides of business activity occurred.

That problem we have treated by successive approximations. Reports in trade and financial periodicals give the opinions of contemporary observers upon current changes in business conditions. We check the consensus of these opinions by studying whatever statistical series are available for the periods under examination, and select tentative dates to mark the troughs and peaks of successive business cycles. After removing seasonal variations, our one adjustment of the original data, we fix the dates of the peaks and troughs of the cycles in each series. Of course we find a considerable scatter of the dates on which different series make their turns in a given business cycle. From these scattered arrays we attempt to approximate the months around which the cyclical revivals and recessions in individual series centered. To that end we compare the timing of the cyclical turns in individual series with our tentative dates of the peaks and troughs of business cycles, and then revise these tentative dates in whatever way the first results suggest. Some series lead with considerable regularity the turning dates that we accept for business

[1] This bulletin was originally prepared as a memorandum at the request of a public agency. In response to several inquiries, it is here published as originally written except for minor revisions. The results are highly tentative, as Section VI stresses.

In the National Bureau's study of business cycles, of which this bulletin is a minor by-product, the writers have been assisted by D. M. Cook, H. Irving Forman, Frances Goldberg, K. G. Laubenstein, G. L. Miron, Sophie Sakowitz, Denis Volkenau, and several others no longer with us. Thanks are due also to Simon Kuznets and to Milton Friedman for criticisms of our first draft.

[2] For fuller explanations of the National Bureau's methods of measuring cyclical behavior, see *Bulletin 57*.

cycles; some coincide with them on the average, others commonly or always lag behind.

As this statement implies, a business-cycle revival is not an event that happens in a single month, but a complicated series of changes that occur cumulatively in various economic processes during a period that may last a year or more. We are vague concerning the duration of revivals because we have no need to mark off this phase of a business cycle from the contraction out of which it develops or from the expansion into which it grows. But we do need to determine the order in which different activities join the procession of revival, and for that purpose it is desirable to have basing points in time from which to measure 'leads' and 'lags'. The most convenient basing point to use for a revival is the month around which cluster the cyclical upturns in different types of production, construction work, transportation, commodity prices, merchandising, employment, disbursements of incomes, profits, security prices, investments, the pecuniary volume of business, interest rates, banking operations, and other economic variables of which we have statistical records. Though a mean is not an adequate description of the array from which it is computed, it is an exceedingly useful tool in studying that array. Similarly, the monthly dates by which we identify business-cycle revivals and business-cycle recessions are not adequate statements of the timing of these shifts from contraction to expansion and from expansion back to contraction; but they are exceedingly useful tools for systematic study of a long array of changes, some of which occur months earlier than the month we choose, others during that month, others months later.

Table 1 shows what we call 'reference dates' of business cycles in the United States from January 1855 to March 1933.[3] As yet we have not attempted to fix the date on which the current cycle reached its peak, though we suppose that this date was late in 1936 or in the spring of 1937.

The leads and lags of individual series at revivals or recessions are determined by comparing the dates of the

[3] Once our analysis of time series is completed we shall subject our reference dates to a searching test. In theory the operations described in the text should be repeated until no further improvement seems possible with the available data. We expect that revisions will be necessary but that they will be minor. In *Bulletin 61* we noted that the trough in 1927 should have been dated November instead of December.

In fixing reference dates of business cycles we not infrequently find that the peaks are 'double-topped' or that the troughs are 'double-bottomed'. Our general rule, in cases of doubt, is to take the later date as marking the cyclical turn. Of course, this practice results in a bias in our timing measurements of individual series in the sense that leads are more numerous than lags.

Any error that we may make in fixing the reference dates affects the absolute magnitude of the timing measures, but it in no way affects the sequence in time of the cyclical turns that occur in individual series during a business-cycle revival or recession. Also the average sequence of individual series is unaffected by errors in our reference dates when the series cover indentical periods. But when the series cover different periods the average sequence will be affected by errors in the dating of those business cycles that are not covered by all the series included in the comparison.

TABLE 1

REFERENCE DATES AND DURATIONS OF BUSINESS CYCLES

UNITED STATES, 1855-1933

Expansion		Contraction		Duration in months		
Revival	Peak	Recession	Trough	Expansion	Contraction	Full cycle
Jan. 1855	June 1857	July 1857	Dec. 1858	30	18	48
Jan. 1859	Oct. 1860	Nov. 1860	June 1861	22	8	30
July 1861	Apr. 1865	May 1865	Dec. 1867	46	32	78
Jan. 1868	June 1869	July 1869	Dec. 1870	18	18	36
Jan. 1871	Oct. 1873	Nov. 1873	Mar. 1879	34	65	99
Apr. 1879	Mar. 1882	Apr. 1882	May 1885	36	38	74
June 1885	Mar. 1887	Apr. 1887	Apr. 1888	22	13	35
May 1888	July 1890	Aug. 1890	May 1891	27	10	37
June 1891	Jan. 1893	Feb. 1893	June 1894	20	17	37
July 1894	Dec. 1895	Jan. 1896	June 1897	18	18	36
July 1897	June 1899	July 1899	Dec. 1900	24	18	42
Jan. 1901	Sept. 1902	Oct. 1902	Aug. 1904	21	23	44
Sept. 1904	May 1907	June 1907	June 1908	33	13	46
July 1908	Jan. 1910	Feb. 1910	Jan. 1912	19	24	43
Feb. 1912	Jan. 1913	Feb. 1913	Dec. 1914	12	23	35
Jan. 1915	Aug. 1918	Sept. 1918	Apr. 1919	44	8	52
May 1919	Jan. 1920	Feb. 1920	Sept. 1921	9	20	29
Oct. 1921	May 1923	June 1923	July 1924	20	14	34
Aug. 1924	Oct. 1926	Nov. 1926	Dec. 1927	27	14	41
Jan. 1928	June 1929	July 1929	Mar. 1933	18	45	63
Average duration, 20 cycles				25	22	47

cyclical turns in each series with the corresponding reference dates in Table 1. Of course the reference dates are subject to error, particularly in the earlier decades, for which few monthly series are available. Also the cyclical turns in some series are so obscured by erratic movements that they are hard to fix. Though we include few such series in this bulletin, we cannot be sure that all the specifc turning points we have taken are correct. Other possible sources of mistakes are imperfect adjustments for seasonal variations, and errors in the original data. Hence our leads and lags are not to be trusted implicitly. All that we can claim for them is that they represent the best judgments that we could form after a study of a considerable body of statistical evidence.[4]

One other remark is necessary. The durations of business cycles as shown in Table 1 differ so much and so irregularly that they give little help in judging when the next cyclical turn may occur. And the durations of cyclical contractions appear to be even more variable than those of cyclical expansions. If our reference dates are correct, since 1855 there have been two cyclical contractions as short as eight months: one at the outbreak of the Civil War, one at the close of the World War. If we set these instances aside on the ground that they were dominated by random factors, there remain five contractions lasting only 10, 13, or 14 months. At the other extreme are the long contraction of the 1870's (65 months) and the 'Great Depression' of 1929-33 (45 months). Thus we cannot tell from experience as recorded in Table 1 that the present contraction may not end within a few months, or that it may not drag on for several years.

[4] Difficulties are inevitably encountered in matching specific-cycle troughs (that is, the cyclical troughs in individual series) with reference troughs, but they do not occur frequently in the group of series presented in this bulletin. When either of two specific-cycle troughs may be related to a reference trough, our general rule is to choose that specific-cycle trough which deviates from the reference trough by a smaller percentage of the duration of the reference phase within which it falls. This mechanical rule at times gives obviously false results, and we have not used it in the few instances where that happened.

A puzzling question is raised in three or four other instances when mechanical matching of specific-cycle troughs with reference troughs yields leads that are longer than a full reference phase; that is to say, the trough in the series comes earlier than the reference peak preceding the reference trough with which the trough in the series is compared. At first blush, it seems that such cases are absurd and that they should be dropped. But when a series usually leads at cyclical revivals by a substantial interval, random factors are as likely to produce leads that are slightly longer than a full reference phase as they are to produce short lags. To give random factors an opportunity to cancel out, it therefore seems better to include all instances, and that is what we have done. Of course, this liberty can be taken only in series with specific cycles that conform very closely to business cycles.

III. CRITERIA FOR SELECTING TRUSTWORTHY STATISTICAL INDICATORS OF CYCLICAL REVIVALS AND RECESSIONS

An ideal statistical indicator of cyclical revivals and recessions would have the following characteristics:

1) It would cover half a century or longer, thus showing its relation to business cycles under a variety of conditions.
2) It would lead the month around which cyclical revival centers by an invariable interval—say three months, or better, six months. It would also lead the central month of every cyclical recession by an invariable interval, which might differ from the lead at revival.
3) It would show no erratic movements; that is, it would sweep smoothly up from each cyclical trough to the next cyclical peak and then sweep smoothly down to the next trough, so that every change in its direction would herald the coming of a revival or recession in general business.
4) Its cyclical movements would be pronounced enough to be readily recognized, and give some indication of the relative amplitude of the coming change.
5) It would be so related to general business activity as to establish as much confidence as the nature of such things allows that its future behavior in regard to business cycles will be like its past behavior.

Even if we could fix the central month of every revival and recession with assurance, we could find no series that possesses all these characteristics. What we have done is to accept our reference dates as fair working approximations to these central months, and then to select those series that approach the 'ideal' statistical indicator most closely. Most of the series are shorter than we like; the intervals of the leads or lags always vary appreciably from cycle to cycle, and all the long series that usually lead at revivals or recessions lag occasionally; all show some erratic movements, so that an upturn during a cyclical contraction may not mean that a general revival is 'just around the corner', and a downturn during expansion may not mean that a general recession is imminent; the relation of the series that we have selected to general business activity is such as to establish a presumption of their diagnostic, and perhaps in some measure of their prognostic, value; but we can never be sure that unusual circumstances may not make any series behave in an unprecedented fashion at the next revival or recession.

It is because of the past shortcomings of the most trustworthy indicators we have been able to find that we think it unsafe to base judgments of current conditions upon the behavior of any one series, or of a few series. The likelihood of being misled is reduced, though not eliminated, if one uses a considerable number of series, each with a good past record as an indicator, and representing in the aggregate a wide range of business activities.

IV. STATISTICAL SERIES THAT HAVE BEEN RELATIVELY CONSISTENT INDICATORS OF BUSINESS-CYCLE REVIVALS

From the 487 American monthly or quarterly series analyzed, we have selected 71 that have been tolerably consistent in their timing in relation to business-cycle revivals and that at the same time are of sufficiently general interest to warrant some attention by students of current economic conditions. Most of these series are fairly good indicators also of cyclical recessions; but we confine this bulletin to indicators of cyclical revivals.

These 71 series are listed in Table 2 in the order of the average timing of their cyclical upturns, beginning with the series that lead the procession of revival by the longest average intervals and ending with the series that lag farthest behind. These averages are based upon whatever periods the series cover. The series entered on lines 1 to 49 have *led* at two-thirds or more of the reference revivals that occurred within the periods covered by the data. The series entered on lines 65 to 68, and 71 to 75 have *lagged* at two-thirds or more of the reference revivals that occurred within the periods covered.[5] Series that have made their cyclical upturns within three months or less of the reference dates for revivals in two-thirds or more of the instances are also included; for these series have considerable consistency in cyclical timing, whether they alternate between leads and lags or show a marked tendency to turn upward shortly before or shortly after the reference dates.[6]

To facilitate the reading of Table 2 we explain the captions and symbols column by column.

Column 3, 'Period covered by specific cycles', gives the date of the initial trough of the first specific cycle that we recognize in the series and the date of the terminal trough of the cycle with which our analysis closes. By specific cycles we mean the cyclical movements found in an individual series, as distinguished from business cycles, which are the whole congeries of cyclical movements in most of the economic activities of a nation.

Columns 4 and 5, 'Number of cycles', show how many specific cycles occurred in each series during the period marked off by the dates in column 3, and how many business cycles occurred during approximately the same period. The entries in columns 4 and 5 are the same in about two-thirds of the series. In a few series this identity is fortuitous; one specific cycle may stretch over the period occupied by two business cycles and at another time two specific cycles may occur within the period occupied by one business cycle. Those series which show a one-to-one correspondence between specific cycles and business cycles are marked with an asterisk in column 4.

Column 6, 'Average lead or lag', reports the average timing of the specific-cycle revivals in each series in relation to the reference dates of business-cycle revivals. A minus (—) indicates that revivals in the series occur earlier on the average than the corresponding reference revivals. A plus (+) indicates that revivals in the series occur later on the average than the corresponding reference revivals. An entry of zero means that the timing of specific-cycle revivals is coincident on the average with the timing of reference revivals.

Columns 7 and 8, 'Average deviation' and 'Range of leads or lags', show how variable the timing of specific-cycle revivals has been in relation to business cycles. The average deviation of the leads or lags from their mean is entered in column 7. The limits within which the leads or lags fall are entered in column 8. This range shows vividly how much more fickle the behavior of some series has been than that of others; but it must be borne in mind that a series that covers a dozen cycles represents reactions under a greater variety of conditions than does a series that covers only four or five cycles.

Columns 9 to 12 supply additional details on the timing of the series in our list. They show the number of timing observations that lead, lag or coincide with the reference dates, and the number that fall within three months of these dates. When the specific cycles in a series bear a one-to-one correspondence to business cycles the sum of the entries in columns 9 to 11 must be larger by one than the number of business cycles covered as shown in column 5; for we make observations both at the trough with which each business cycle starts and at the trough with which it ends. If a series 'skips' one business cycle, the sum of entries in columns 9 to 11 is equal to the entry in column 5; if it skips two business cycles, the sum is one less than the entry in column 5. When there is a break in the data, caused by the omission of certain cycles, these relations apply to each segment of the series taken by itself, not to the series as a whole.

Columns 13 and 14 report upon the erratic movements to which each series is subject. Erratic movements are the criss-cross fluctuations that occur within the cyclical expansions and contractions of economic time series. We judge the intensity of the erratic movements in a series by comparing roughly the amplitude of their rise and fall with the amplitude of the rise and fall of the specific cycles. Column 13 indicates these relative intensities by a scale that runs from mild to moderate, pronounced and very pronounced.[7] Column 14 indicates the average number of

[5] As later explained, we make a double analysis of several series; hence the discrepancy between the number of series and the number of entries in the table.

[6] The two-thirds rule was relaxed slightly in the case of total imports, power production, number of failures of trading companies, the price of copper and zinc, and the index of prices of metals and metal products.

[7] When the erratic movements are of mild amplitude relatively to the amplitude of specific cycles, they usually disappear when we divide each cycle into nine stages and take averages of the months falling within each stage (see the description of Table

months in which the seasonally-adjusted data of each series move in the same direction, and thus indicates the frequency with which erratic movements run counter to the direction of a specific-cycle expansion or contraction.[8]

Columns 15 to 20 show the average amplitudes of the cyclical movements found in each series, together with the average deviations of the amplitudes. The amplitude of a specific cycle is measured by: (1) turning the seasonally-adjusted data for that cycle into relatives of their average value; (2) computing the average of the relatives for the three months centered on the initial trough of the specific cycle, on the peak, and on the terminal trough; (3) finding the rise from the average for the three months centered on the initial trough of the specific cycle to the average for the three months centered on its peak, the fall from the average at the peak to the average for the three months centered on the terminal trough, and summing the rise and fall so computed. Thus the amplitude measures state essentially the range of fluctuations of cyclical movements in the form of percentages of the average value of the items composing a series during a specific cycle. Columns 15-17 show the average rise, fall, and combined rise and fall of the specific cycles found in each series. Columns 18-20 show the average deviations of the amplitude measures of these cycles about their means.

Series that tend to decline when general business expands and to advance when general business contracts are marked in columns 2, 6, 15 and 16 by the symbol '*i*' to show that they have an inverted relation to business cycles. In all such instances the entry in column 6 shows the average number of months that the recessions of specific cycles lead or lag at reference revivals; the entry in column 15 shows the average fall of the specific cycles, not the rise; and the entry in column 16 shows the average rise, not the fall.[9]

A series that usually makes its cyclical turns near the middle of reference expansions and near the middle of reference contractions can be treated as having either a positive or an inverted relation to business cycles. Three series on bond yields appear at the bottom of Table 2 because they have exceptionally long lags at reference revivals. But when a process reacts fairly consistently to business cycles, long lags of its specific-cycle revivals at reference revivals must mean that its specific-cycle recessions lead the reference revivals by substantial intervals. Hence the timing of bond yields is shown in Table 2 on an inverted as well as on a positive basis. For a similar reason a double set of entries is made for bond sales on the New York Stock Exchange.[10]

V. A LIST OF THE MOST TRUSTWORTHY INDICATORS OF BUSINESS-CYCLE REVIVALS

Critical examination of Table 2 shows the respects in which and the degrees to which the different series fall short of the requirements of an ideal indicator of business conditions that were set forth above. No doubt each of the 71 series may make a contribution to judgments about the occurrence of a cyclical revival. But some are more trustworthy indicators than others and merit special consideration on that ground. If we can determine which these series are we shall have a much shorter list—and the brevity will be an advantage, provided that it is not gained by reducing overmuch the variety of activities represented.

We have considered the following factors in making this final selection from our materials: Other things equal, a series is more useful as an early indicator of revivals in general business,

1) The longer its average leads at past revivals
2) The more uniform are these leads in occurrence and length
3) The closer its specific cycles come to having a one-to-one correspondence to business cycles
4) The more clearly defined its specific cycles

(footnote[7] concluded)
A4 and A5 in *Bulletin 57*). But this rarely happens when the erratic movements are relatively violent. Therefore, a simple though indirect method of judging the amplitude of the erratic movements in a series relatively to the amplitude of its specific cycles is to compare the number of irregularities in its successive specific-cycle patterns with the number of possible irregularities. Any decline from stages I to II, II to III or III to IV, or any rise from stages V to VI, VI to VII or VII to VIII was treated as an irregularity in all series analyzed 'positively'. The number of irregularities was summated for each series and expressed as a ratio to the number of specific cycles. Then the scale of these ratios was divided arbitrarily into four parts: ratios of .25 or under being taken as indicative of mild erratic movements, .26 through .50 as moderate, .51 through .75 as pronounced, and .76 or over as very pronounced. These judgments were checked against independent judgments made from the graphs of the seasonally-adjusted data of each series, and in a few instances revised in the light of the graphs. We recognize the roughness of our method by using descriptive statements instead of numerical values.

[8] In series reported as aggregates, the frequency of erratic movements can be reduced by adjusting the figures for variations in the number of working days before eliminating the seasonal variations. Experience teaches that the reduction usually is slight. We have not made such adjustments, though a few of the series that we analyze come to us so adjusted. See Table 2, note 3.

[9] The amplitudes of the series that are analyzed invertedly are computed like the amplitudes of the positive series, except that they are expressed as percentages of the average value of a series from the peak of one specific cycle to the peak of the next specific cycle.

[10] Of course, all series having long leads or lags might be subjected to a double analysis, as are bond yields and bond sales. Thus we might have added an inverted analysis for orders of fabricated structural steel and a positive analysis for business failures. But, from a logical standpoint, these series are best treated as now shown. Further, an inverted analysis for the former and a positive analysis for the latter yield much more irregular timing measures.

TABLE 2

TIMING OF 71 SERIES AT BUSINESS-CYCLE REVIVALS IN THE UNITED STATES, THEIR ERRATIC MOVEMENTS AND THEIR CYCLICAL AMPLITUDES

(The series are listed in the order of their average leads at business-cycle revivals)

Line number	Series[1]	Period covered by specific cycles[2]	No. of cycles: Specific	No. of cycles: Business	Average lead (−) or lag (+) (months)	Average deviation of leads or lags (months)	Range of leads or lags (months)	Number of timing observations that are: Leads	Lags	Coincidences	Within 3 mos. of revivals	Erratic movements: Relative intensity	Erratic movements: Av. no. of mos. in which data move in same direction[3]	Amplitude of specific cycles: Average: Rise	Average: Fall	Average: Rise and fall[4]	Average deviation: Rise	Average deviation: Fall	Average deviation: Rise and fall	Line number
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1	Orders of fabricated structural steel	Nov10-Jan32	8	6	−10	5	−15 to −1	7	0	0	2	Pronounced	2.1	78	78	156	30	32	44	1
2	Yields of 15 high grade industrial bonds(*i*)	Sep00-Jun32	9	9	*i*−10	4	−16 to −3	9	0	0	1	Mild	2.6	*i*8	*i*16	24	5	12	12	2
3	Yields of 15 high grade public utility bonds(*i*)	Oct00-Jun32	9	9	*i*−9	3	−17 to −2	9	0	0	1	Mild	2.9	*i*9	*i*12	21	6	8	8	3
4	Yields of railroad bonds, Macaulay(*i*)	Oct57-Jun32	21	19	*i*−9	10	−64 to +23	13	4	1	1	Mild	2.8	*i*14	*i*12	26	9	7	11	4
5	Business failures, total liabilities(*i*)	Apr84-Oct31	13	12	*i*−9	3	−17 to +6	13	1	0	0	Pronounced	1.5	*i*117	*i*126	243	83	78	110	5
6	Business failures, all commercial liabilities(*i*)	Oct75-Apr32	13	13	*i*−8	3	−13 to +5	13	1	0	0	Pronounced	1.6	*i*120	*i*136	256	62	60	103	6
7	Bond sales, N. Y. Stock Exch.	Feb94-Nov32	13	11	−8	6	−22 to +16	11	1	0	0	Moderate	1.7	86	78	163	39	37	68	7
8	Index of industrial stock prices, Dow-Jones	May97-Jun32	9	10	−7	5	−18 to 0	9	0	1	4	Mild	2.9	55	47	102	23	27	49	8
9	Index of railroad stock prices, Macaulay	Oct57-Jun32	18	19	−7	8	−32 to +12	14	4	0	5	Mild	2.7	36	32	67	20	17	36	9
10	Building plans, Manhattan	Dec69-Mar33	17	16	−7	4	−19 to +3	13	1	2	4	Pronounced	1.5	111	111	223	50	49	89	10
11	Passenger car production	Oct13-Oct32	5*	5	−6	4	−14 to −1	6	0	0	2	Moderate	2.6	104	96	200	23	29	34	11
12	Inner tube production	Dec20-Mar33	3*	3	−6	5	−12 to 0	3	0	1	2	Moderate	1.8	66	52	117	38	28	29	12
13	Bank clearings, N.Y.C.	Feb55-Apr33	23	20	−6	5	−16 to +2	17	3	1	9	Mild	1.7	53	43	95	25	20	40	13
14	Price of hides, Chicago	Jun92-Jun32	11	10	−6	6	−20 to +13	10	2	0	3	Moderate	2.3	44	45	90	19	23	35	14
15	Index of prices of hides and leather	Aug94-Feb33	8	9	−5	5	−15 to +7	8	2	0	4	Mild	3.6	17	18	35	6	12	17	15
16	Railroad operating income, total	May08-Jul32	5*	5	−5	4	−13 to 0	5	0	2	3	Mild	1.8	72	51	123	54	28	70	16
17	Orders of steel sheets	Mar19-Mar33	4*	4	−5	5	−12 to 0	4	0	1	3	Very pronounced	1.8	95	95	190	16	30	26	17
18	Number of shares sold, N.Y. Stock Exch.	Feb78-Mar33	15*	15	−5	5	−19 to +7	12	2	2	8	Pronounced	1.8	98	92	190	32	31	56	18
19	Paper production, total	Mar19-Jan33	4*	4	−5	4	−11 to −1	5	0	0	3	Mild	1.7	32	26	57	11	17	14	19
20	Book paper production	Dec18-Jul32	4*	4	−4	2	−8 to +1	4	1	0	1	Moderate	1.7	34	31	66	10	24	23	20
21	Steel sheet production	Mar19-Aug32	4*	4	−4	3	−8 to −1	5	0	0	3	Pronounced	2.1	70	76	146	17	34	24	21
22	Truck production	Sep14-Aug32	6	5	−4	2	−8 to −1	6	0	0	3	Moderate	2.0	85	55	140	20	39	37	22
23	Freight hauled, ton-miles	Feb08-Aug32	5*	5	−4	3	−11 to −1	7	0	0	4	Mild	2.4	26	28	54	7	18	13	23
24	Total building contracts, floor space	Jan19-Dec32	4*	4	−4	3	−9 to +1	4	1	0	3	Mild	2.0	74	86	160	31	46	44	24
25	Residential building contracts, floor space	Jan19-Dec32	4*	4	−4	3	−9 to 0	4	0	1	3	Mild	1.9	97	105	202	39	68	80	25
26	Commercial building contracts, floor space	Jan19-Oct32	4*	4	−4	3	−9 to 0	4	0	1	3	Moderate	1.7	66	80	146	8	48	52	26
27	Food factories building contracts, value	Jan19-Sep32	4*	4	−4	2	−7 to −1	5	0	0	3	Moderate	1.5	84	105	190	8	41	49	27
28	Orders of oak flooring	Dec13-Mar34	5	5	−4	6	−12 to +12	4	1	0	0	Moderate	1.9	101	111	212	38	33	39	28
29	Average hours worked, all wage earners	Feb21-Aug32	3*	3	−4	3	−7 to 0	3	0	1	2	Mild	2.3	8	16	23	4	13	10	29
30	Index of wholesale prices, Bradstreet's	Jun96-Feb33	8*	8	−4	4	−12 to +5	9	1	0	4	Mild	3.4	17	18	34	7	13	14	30
31	Index of deposits activity, Snyder	Dec78-Jan33	14	15	−4	4	−16 to +4	13	2	0	8	Moderate	3.9	29	30	59	12	17	27	31
32	Bank clearings, outside N.Y.C.	May78-Mar33	13*	13	−4	4	−11 to +4	11	1	3	8	Moderate	1.7	30	19	49	10	17	20	32
33	Index of business activity, Ayres	Dec54-Jul32	21	20	−3	4	−12 to +3	14	2	5	13	Mild	3.1	19	22	41	5	8	11	33
34	Index of business activity, Pittsburgh district	Jan85-Mar33	15	14	−3	3	−9 to +1	12	1	2	10	Moderate	3.2	29	31	60	8	12	15	34
35	Clearings index of business, Snyder	Jan79-May33	15	15	−3	2	−8 to +2	11	1	3	11	Mild	3.2	16	18	34	6	9	10	35

40	Cotton consumption	Aug14-Jul32	6	5	−3	4	−9 to +4	5	1	0	2	Moderate	1.4	32	35	68	14	8	14
41	Price of copper, N.Y.C.	Jan68-Feb33	13	15	−3	5	−21 to +10	10	3	1	7	Moderate	3.6	42	50	92	19	29	46
42	Imports, semi-manufactures	Feb08-Feb33	5*	5	−3	4	−10 to +1	5	1	1	4	Moderate	1.7	54	51	105	20	37	46
43	Industrial building contracts, floor space	Feb19-Jul32	4*	4	−3	2	−8 to 0	4	0	1	4	Mild	1.5	109	130	239	38	67	93
44	Price of zinc, N.Y.C.	Apr95-Jul32	8	9	−2	5	−19 to +10	7	2	1	5	Mild	2.8	39	38	77	12	17	21
45	Index of physical volume of business, Babson	Oct04-Mar33	8*	8	−2	3	−12 to +2	6	1	2	7	Mild	2.6	29	24	53	7	13	14
46	Coke production, total	Nov14-Aug32	5*	5	−2	2	−7 to +1	4	1	1	5	Mild	2.9	56	61	117	21	23	27
47	Electric power production	Mar19-Mar33	3	4	−2	1	−4 to 0	3	0	1	3	Mild	2.0	35	12	47	12	7	17
48	Freight cars loaded	Mar19-Aug32	4*	4	−2	2	−7 to 0	4	0	1	4	Moderate	1.8	17	25	42	6	20	17
49	Railroad operating revenue, freight	May08-Jul32	5*	5	−2	3	−8 to +3	5	1	1	5	Moderate	1.9	21	24	46	6	18	14
50	Index of machine tool orders	Feb19-Mar33	4*	4	−2	2	−8 to 0	3	0	2	4	Mild	1.8	110	129	239	15	72	81
51	Total imports	Jan68-Feb33	16	15	−2	4	−12 to +8	9	5	2	11	Moderate	1.7	38	33	71	12	17	23
52	New corporate issues, industrial	Apr19-Jun32	4*	4	−2	3	−9 to +2	2	1	2	4	Pronounced	1.6	142	162	303	64	94	158
53	Index of business activity, A. T. & T.	Apr79-Mar33	15*	15	−2	3	−8 to +1	8	1	7	11	Mild	3.4	23	26	49	5	10	12
54	Production of producers' goods, F.R. Bk. of N.Y.	Mar19-Jun32	4*	4	−2	3	−9 to +2	2	1	2	4	Mild	2.9	24	39	63	5	19	17
55	Index of industrial production, Stand. Stat. Co.	May19-Mar33	4*	4	−1	2	−6 to +1	2	1	2	4	Mild	4.4	32	36	68	12	22	20
56	Department store sales	Jan19-Mar33	4*	4	−1	2	−3 to +3	2	1	2	5	Mild	1.9	16	18	34	8	18	20
57	Railroad expenses on maintenance of way and structures	Mar08-Apr33	5*	5	0	4	−9 to +8	3	4	0	5	Mild	2.3	19	29	48	7	27	22
58	Raw cotton stocks at mills	Oct14-Mar33	7	5	0	4	−10 to +9	2	2	2	4	Mild	2.9	34	32	66	16	11	24
59	Factory payrolls, total	Mar19-Mar33	4*	4	0	1	−1 to +2	2	1	2	5	Mild	3.4	27	44	71	11	31	30
60	Factory employment, total	Jan15-Mar33	5*	5	0	1	−2 to +1	2	2	2	6	Mild	5.1	16	24	40	6	16	13
61	Factory payrolls, iron and steel	May19-Mar33	4*	4	0	1	−2 to +1	1	2	2	5	Mild	2.5	42	62	104	19	42	36
62	Factory employment, iron and steel	May19-Mar33	4*	4	0	1	−2 to +1	1	3	1	5	Moderate	3.6	25	39	64	14	25	21
63	Factory employment, N.Y. State	Jan15-Mar33	5*	5	+1	2	−1 to +5	1	3	2	5	Mild	3.4	15	25	40	7	15	11
64	Factory payrolls, machinery	Jun-19-Mar33	4*	4	+1	1	0 to +2	0	3	2	5	Mild	2.7	46	63	109	12	46	51
65	Factory employment, machinery	Jun-19-Mar33	4*	4	+1	1	0 to +2	0	4	1	5	Mild	6.3	31	46	76	10	31	30
66	Business failures, number of trading cos. (*i*)	Sep96-Aug32	9	10	*i*+1	5	−9 to +17	3	7	0	4	Mild	1.6	*i*42	*i*50	92	30	26	46
67	Factory payrolls, N.Y. State	Jan15-Mar33	5*	5	+2	2	0 to +4	0	4	2	4	Mild	2.8	34	33	67	18	25	27
68	Magazine advertising	Apr15-Apr33	5*	5	+2	3	−4 to +9	2	4	0	3	Mild	1.9	35	33	68	14	24	30
69	Index of retail prices of foods, B.L.S.	Sep22-Feb33	3*	3	+3	5	−2 to +12	2	2	0	3	Moderate	2.4	8	20	28	3	20	19
70	Index of prices of metals and metal products	Mar95-Apr33	8	9	+3	4	−2 to +11	5	5	0	7	Mild	4.0	23	24	46	15	7	21
71	Index of prices of fuel and lighting	Jun92-May33	10	10	+5	4	−6 to +13	1	9	1	4	Moderate	2.9	24	24	49	14	8	20
72	Bond sales, N.Y. Stock Exch. (*i*)	May92-Feb34	14	12	*i*+7	7	−11 to +22	2	11	0	2	Moderate	1.7	*i*70	*i*92	162	34	48	68
73	Yields of 15 high grade public utility bonds	Apr01-Apr28	7	8	+10	8	−2 to +25	1	7	0	1	Mild	2.9	11	10	21	7	7	10
74	Yields of 15 high grade industrial bonds	Jul02-Jan28	7	8	+10	8	−8 to +19	1	7	0	2	Mild	2.6	10	9	19	5	5	9
75	Yields of railroad bonds, Macaulay	Aug60-Dec27	19	18	+12	7	−6 to +27	2	14	1	1	Mild	2.8	10	13	23	5	8	10

[1] All series are monthly, except total liabilities of business failures, reported by quarters before 1893, and liabilities of commercial business failures, quarterly before 1896. The three series on bond yields and the series on bond sales appear near the top and again at the bottom of the table; see the text for explanation.

[2] The period from about 1915 to 1921, depending upon the dating of the specific-cycle turns, is omitted from all series on prices of commodities, value of foreign trade, railroad revenues and expenses, liabilities of business failures, and bank clearings outside New York. The period from 1911 to 1919 is omitted from ton-miles of freight hauled, because data are lacking from July 1914 to March 1916.

[3] Based on experience during 1919-33, except in series for which we omit the cycle from 1919 to 1921. Horizontal movements were not considered a change in direction; thus a rise followed by a horizontal movement and another rise was counted as a single rise.

[4] This column is computed directly from the individual cycles; hence the slight discrepancies between the entries on 'rise and fall' and the sum of the entries on 'rise' and 'fall'. The figures are expressed in units of specific-cycle relatives, as explained in the text.

(*i*) Series is treated as 'inverted'; see text for explanation.

*Specific cycles show one-to-one correspondence to business cycles; see text for explanation.

5) The less intense its erratic movements in comparison with the amplitude of its specific cycles
6) The fewer the changes in the direction of its month-to-month movements
7) The smaller and more regular the seasonal variations that have to be 'eliminated' before the specific cycles can be studied
8) The larger the number of past revivals covered by the series
9) The farther back in time any irregularities in conformity to business-cycle revivals occurred
10) The broader the range of activities represented by the series
11) The more stable the economic significance of the process represented

But other things never are equal. When a series ranks high as judged by one or two of these criteria, it ranks lower as judged by others. Hence we have drawn up an annotated list of the series that seem to us to be the most trustworthy indicators of revivals. We include series that may have some prognostic value on account of their long average leads, and also series that have short average leads or no leads, but that show notably narrow ranges in their cyclical timing and therefore have confirmatory value concerning the occurrence of a general business revival. The annotations show both the respects in which the series merit high rank and their shortcomings. We state also the line in Table 2 on which each series may be found and the source in which it is currently reported.

TOTAL LIABILITIES OF BUSINESS FAILURES (Line 5)
Average lead 9 months. A long series that moves invertedly. Our analysis covers 12 business cycles, but 14 revivals. Thirteen leads, one lag. Range of timing, —17 to +6 months. Leads consistently long, shortest being 6 months. Extra specific cycle and single lag occur before 1901. Erratic movements are pronounced and changes in direction frequent; but in neighborhood of cyclical revivals the erratic movements are moderate. Seasonal large but tolerably stable. These remarks are based upon Bradstreet's compilations which were discontinued in January 1933. Data of somewhat narrower coverage compiled for many years by Dun's (line 6 in Table 2) behave in much the same way; see *Dun's Statistical Review.*

DOW-JONES INDEX OF INDUSTRIAL STOCK PRICES (Line 8)
Average lead 7 months. A long series; covers 10 business cycles. No lags, but one coincidence. Timing ranges from —18 to 0 months. Erratic movements mild. Reversals of direction relatively infrequent. No seasonal. Skips the cyclical decline of 1926-27, but shows marked retardation in 1926 and early 1927. Source: *Wall Street Journal.*

PASSENGER CAR PRODUCTION (Line 11)
Average lead 6 months. No lags or coincidences. Covers only 5 cycles but they bear a one-to-one correspondence to business cycles. Leads range from 1 to 14 months; they are smaller in the last three than in the first three revivals. Reversals of direction relatively infrequent; but erratic movements moderate, and seasonal large and unstable. Source: Bureau of the Census, *Automobiles.*

INNER TUBE PRODUCTION (Line 12)
Average lead 6 months. No lags, one coincidence. One-to-one correspondence, but covers only 3 cycles. Timing ranges from —12 to 0. Erratic movements moderate, but reversals of direction relatively frequent and seasonal fairly large and changing. Source: *Survey of Current Business.*

TOTAL RAILROAD OPERATING INCOME (Line 16)
Average lead 5 months. No lags, two coincidences. One-to-one correspondence. Covers 5 cycles, two of them pre-War. Timing ranges from —13 to 0. Erratic movements mild on the whole except during 1918-24; but they are of uneven intensity, and reversals rather frequent. Seasonal stable but large. Source: Interstate Commerce Commission, *Operating Revenues and Operating Expenses of Class I Steam Railways.*

TOTAL PAPER PRODUCTION (Line 19)
Average lead 5 months. No lags or coincidences. One-to-one correspondence. Covers only 4 cycles. Leads range from 1 to 11 months. Erratic movements generally mild but reversals of direction rather frequent. Further, the cyclical decline of 1926-27 is not clearly reflected in this series. Seasonal small and relatively stable. Source: *Survey of Current Business.*

TRUCK PRODUCTION (Line 22)
Average lead 4 months. No lags or coincidences. Covers 5 cycles. Timing range narrow, —8 to —1. Shows an extra specific cycle, but it was of slight amplitude and occurred during the War. Erratic movements moderate. Seasonal large but smaller than in passenger cars; however, reversals of direction in data more frequent. Source: Bureau of the Census, *Automobiles.*

TON-MILES OF FREIGHT HAULED (Line 23)
Average lead 4 months. No lags or coincidences. One-to-one correspondence. Covers 5 cycles, one of them pre-War. Timing range, —11 to —1. Erratic movements mild. Reversals of direction relatively infrequent. Seasonal relatively small and stable. Principal defect is that three of the seven leads are only one month. Source: Interstate Commerce Commission, *Freight Train Performance of Class I Steam Railways.*

TOTAL RESIDENTIAL BUILDING CONTRACTS, FLOOR SPACE (Line 25)
Average lead 4 months. No lags, but one coincidence. One-to-one correspondence. Covers only 4 cycles. Timing measures range from —9 to 0. Erratic movements usually mild, but occasionally substantial; reversals of direction

rather frequent. Seasonal large but tolerably stable. Source: F. W. Dodge Corporation, published in *Survey of Current Business.*

AVERAGE HOURS WORKED, 'ALL' WAGE EARNERS (Line 29)
Average lead 4 months. No lags, one coincidence. Timing range, —7 to 0. One-to-one correspondence. Erratic movements mild; changes in direction relatively infrequent; seasonal slight. But the record is brief—covers only 3 cycles. Source: National Industrial Conference Board, *Conference Board Service Letter.*

INDEX OF WHOLESALE PRICES, BRADSTREET'S (Line 30)
Average lead 4 months. Nine leads, one lag. Range of timing, —12 to +5. Covers 8 cycles, maintaining one-to-one correspondence. Erratic movements mild and changes of direction infrequent. No seasonal. The one lag is five months at the cyclical trough of December 1900. This series was discontinued (see *Dun's Statistical Review*) at the close of 1937. We do not know whether it has a current equivalent, but we list it as an item that may have suggestive value.

BANK CLEARINGS OUTSIDE NEW YORK (Line 32)
Average lead 4 months. Long series, 13 cycles. One-to-one correspondence. Eleven leads, one lag, three coincidences. Range of timing, —11 to +4. Seasonal small and rather stable. However, erratic movements moderate, changes in direction rather frequent, and two or three cyclical movements are of such mild amplitude that they do not stand out clearly. Another defect is that four out of fifteen observations are not leads. Source: *Commercial and Financial Chronicle.*

INDEX OF INDUSTRIAL PRODUCTION, FEDERAL RESERVE BOARD (Line 36)
Average lead 3 months. No lags, one coincidence. Range of timing, —8 to 0. One-to-one correspondence, but covers only 4 cycles. Erratic movements mild, changes of direction infrequent. Reliable indicator; but of slight prognostic value since three of the five timing observations are zero or —1. Source: *Federal Reserve Bulletin.*

PIG-IRON PRODUCTION (Line 37)
Average lead 3 months. Covers 15 cycles, maintaining one-to-one correspondence throughout. One lag, three coincidences. Range of timing, —13 to +1. Erratic movements mild and changes of direction infrequent. Seasonal small and tolerably stable. Principal defect is that the one lag and three coincidences have all occurred since 1914. Source: *Iron Age.*

STEEL-INGOT PRODUCTION (Line 38)
Average lead 3 months. Record shorter than pig iron (9 cycles compared with 15). One-to-one correspondence. One lag, one coincidence. Range —8 to +6. Erratic movements somewhat more intense, changes in direction more frequent and seasonality larger, than in pig iron. Chief advantage over pig iron is that its trend is more representative of the iron and steel industry. Source. *Iron Age.*

INDUSTRIAL BUILDING CONTRACTS, FLOOR SPACE (Line 43)
Average lead 3 months. No lags, one coincidence. One-to-one correspondence, but covers only 4 cycles. Range of timing, —8 to 0. More closely integrated in time with business cycles than any other construction series. Erratic movements mild but reversals frequent; seasonality pronounced and unstable. However, rise from cyclical troughs is very sharp. Principal defects are brevity of the record and the short average lead. Source: data obtained directly from F. W. Dodge Corporation.

INDEX OF BUSINESS ACTIVITY, AMERICAN TELEPHONE AND TELEGRAPH COMPANY (Line 53)
Average lead 2 months. Covers 15 cycles, maintaining one-to-one correspondence. Eight leads, one lag, seven coincidences. Timing range, —8 to +1. Erratic movements mild, and changes of direction infrequent. Source: American Telephone and Telegraph Company, *Summary of Business Conditions.*

INDEX OF PRODUCTION, STANDARD STATISTICS COMPANY (Line 55)
Average lead 1 month. Two leads, one lag, two coincidences. Timing range —6 to +1. One-to-one correspondence. A reliable indicator since 1919, the period to which our analysis is confined. Erratic movements mild. Changes in direction less frequent than in Federal Reserve Board index of production or in the A.T. & T. index of business. Source: Standard Statistics Company, *Standard Trade and Securities: Current Statistics.*

DEPARTMENT STORE SALES (Line 56)
Average lead 1 month. Two leads, one lag, two coincidences. One-to-one correspondence. All five turns occur within three months of reference revivals. Seasonality large and changing, but the changes are fairly continuous. Erratic movements mild, but changes in direction rather frequent. A tolerably good indicator; but covers only 4 cycles and does not reflect very clearly the cyclical decline of 1926-27. Source: *Federal Reserve Bulletin.*

FACTORY EMPLOYMENT, TOTAL (Line 60)
Average timing 0. Timing range very narrow, —2 to +1. Two leads, two lags, two coincidences. One-to-one correspondence. Erratic movements mild, changes in direction exceptionally infrequent. One of the most consistent indicators of revival. Chief limitation is that the record covers only 5 cycles. Source: *Federal Reserve Bulletin.*

OTHER EMPLOYMENT SERIES
Several other employment or payroll series in Table 2 are almost or quite as consistent in their cyclical timing as the series on total factory employment, but they cover 4 cycles

instead of 5. The timing of factory employment in the machinery group (line 65) has been slightly more consistent than that of total employment. Reversals of direction in machinery employment are even less frequent than in total employment. Source: *Federal Reserve Bulletin.*

While we regard the series listed in this section as the most trustworthy indicators of cyclical revivals that our present study of past records establishes, we must stress the difficulties that will be encountered and the precautions that should be observed in forming judgments about current conditions from our list.

VI. CAUTIONS NECESSARY IN JUDGING CYCLICAL REVIVALS

A person who attempts to determine by studying the series we have listed whether or not any trustworthy indications of a cyclical revival exist at a given time will find that he must equip himself with a great deal of additional information before he can reach a reasoned judgment.

The first obstacle he will encounter is that monthly statistical records are never up to date. The monthly series may tell him what the status of business was a month or two ago; they cannot tell him what the status of business is today. The only way to meet the obstacle of tardy monthly reports is to use weekly or daily figures when available. Although data by such short time units are likely to be of little direct use in judging cyclical turns, they make it possible to estimate the standing of individual series in the current month.

A second difficulty arises in treating seasonal components. When seasonal variations change from year to year, the problem of making satisfactory adjustments for current months is hard to solve. The shift in the seasonal pattern of automobile production since the fall of 1935 is merely an extreme instance of a common difficulty. The larger the seasonal variations in a series relatively to the amplitude of its specific cycles, the more serious will be the results of an erroneous seasonal adjustment. A poor seasonal adjustment may produce an upturn that is readily misinterpreted as cyclical or may cancel for a month or more a genuine cyclical upturn. We know no protection against this danger other than a careful comparison of the original and seasonally-adjusted data, plotted on the same chart.

Even when a series is free of seasonal variations, it is difficult to recognize a cyclical turn at the time it actually occurs. A series that has made cyclical upturns usually, if not consistently, some months before our reference dates for revival seems to have high prognostic value, but the chances are fair that it has merely historical value. The reason is that the cyclical movements of economic series are diversified by erratic fluctuations. Table 2 demonstrates that most series typically keep the same direction only two or three months. Once a cyclical decline is well advanced, there is no way of deciding at the time a rise occurs in monthly data whether the rise will prove to be a minor interruption of the downward movement or the beginning of a cyclical expansion.

Mechanical smoothing cannot cope with this problem. It is better to analyze the available data closely than to trust mechanical devices to tell whether a given change in the direction of a statistical series represents an erratic or a cyclical movement. For example, 'aggregate' building permits rose very sharply in the spring of 1929. But that rise was due entirely to the rush by New York City builders to file plans for apartment houses and hotels in time to escape limitations on height and other restrictions of the Multiple Dwelling Act about to be enacted. When New York City is eliminated from the figures, the sharp rise is replaced by a sizable decline. It is often possible thus to break down a statistical series into several component parts, and through study of the parts to arrive at a considered opinion concerning the nature of the movement shown by the total. And it is desirable to supplement such intensive tests by extensive tests. We think that it is wise to test judgments based upon our short list of series by seeing whether they are confirmed by the longer list in Table 2. Also there probably are good business indicators among the series carried by the *Survey of Current Business* and other publications but not included among the 487 series that we have analyzed, because they cover only two cycles as yet or for other reasons. Of course the probable value of short series must be judged by criteria other than consistency of performance.

Another difficulty is that no sequence of average leads of time series in past cyclical revivals can tell what the exact sequence will be at the next revival. The measures of dispersion in Table 2 show that the cyclical behavior of most economic series is highly variable. The variations are at times irregular; at others they reflect secular or structural changes. Business failures lag six months at the cyclical upturn in 1901, although they lead reference revivals by a longer average interval than any other series in our compact list. Truck production made its cyclical upturn after passenger car production at the revivals of 1914 and 1919; at the next three revivals the two moved coincidently, while at the revival of 1933 trucks turned up before passenger cars. The cyclical behavior of money markets has changed so profoundly in recent years that past records do not seem to be valuable guides to the near future. We recognize this fact in Table 2 by stopping the comparison of like cyclical turns of interest rates and general business in 1927.[11] To cite another example, if a study like the present one had been made thirty or forty years ago,

[11] If we tried to compare *like* cyclical turns after 1927, we should have to relate the trough of bond yields in January 1937 with the trough in general business in March 1933—obviously a useless comparison. However, the comparison of *opposite* cycli-

it would have been impossible to include automobile production, but it surely would have been desirable to include railroad purchases in a table like Table 2, though perhaps not in a more compact list, since the erratic fluctuations in railroad purchasing have always been exceptionally violent. Today we must exclude railroad purchases, for their tendency to lead vigorously at cyclical revivals has disappeared. Such changes in cyclical timing are full of instruction to the student of business cycles. They are important also to the man of affairs; he must be alert to changes in the making, eschew simple formulas, test his judgments by study of numerous statistical series, and stand ready to revise his list of indicators as the economic environment changes.

In Table 2 we have indicated only those phases of behavior with respect to business-cycle revivals that can be easily measured, or graded on the basis of measurements. One who wishes to form reasoned judgments about current business prospects should carry his analysis further than we have carried ours in this bulletin. He should plot on large charts the original and seasonally-adjusted data for every series that appears from our preliminary sorting to have prognostic or diagnostic value, preferably using not only the series included in our compact list but all or most series in Table 2. Then he should scrutinize with care the movements of each series during the later stages of past contractions and the earlier stages of past expansions. In this way he may find characteristic behavior traits that are not revealed by our measures. For example, the specific cycles of some series usually show a marked decline in the rate of contraction for some months before they make their cyclical upturns, while in other series the specific cycles usually have sharp V-shaped troughs. Knowledge of such differences may lead to a selection of indicators of revival that differs from our list, and is nearly sure to be helpful in putting the proper interpretation upon the new figures that come month by month.

An investigator can use these charts also to test the value that the series have for him. Let him see what success he might have achieved in trying to interpret the figures that would have been available six months, four months and two months before the last several reference dates for revival. Are there instances in which he could not have discerned a change in the cyclical tide until after it had begun to flow strongly in the new direction? What revivals would he have predicted that proved abortive? If these exercises be performed conscientiously without allowing judgment of the data available at a past time to be shaped by 'hindsight', a difficult feat in self-control, the investigator should learn something about the 'probable error' of his current judgments.[12] But a high score in 'spotting' past revivals at an early stage would not of itself justify great confidence in present anticipations. Indeed, a thoughtful worker would be likely to suspect that a high score represented partly his inability to interpret the data available during past contractions without subconsciously using his knowledge of what happened later.

Many students of current business developments are concerned, not with the cyclical fluctuations of the economy as a whole, but with the prospects of a particular industry, trade or enterprise. On the numberless detailed tasks of this sort we have shed little light, except in so far as the cyclical revivals in the given industry, trade or enterprise are influenced directly or indirectly by business-cycle revivals. Of course this exception constitutes the rule. Nevertheless, cyclical behavior is so variable from industry to industry that an investigator concerned principally with the fortunes of some industry or firm probably will want to find out what other time series, economically related to his own, have commonly or invariably turned up at earlier dates.

An obvious suggestion for reducing the labor and the uncertainties attaching to the use of a list of series such as we have given is to combine the best 'business barometers' into an index number. Whether an index can be made that will be both a prompter and a more trustworthy indicator of business-cycle revivals than any series available at present, we do not know. Five indexes of 'business activity'[13] are included in Table 2, of which only one is admitted to our briefer list, and that index has average leads of only two months. Of course these business indexes were not made for the specific purpose of forecasting revivals. A compiler who set himself this task doubtless could put together an index that turned upward several months before each of our reference dates since the War. But an index made on this strictly empirical basis would have to demonstrate its trustworthiness over several future cycles before it could command much confidence.[14] Such quasi-mechanical methods of trying to improve prognoses seem

(footnote[11] concluded)
cal turns can be formally extended through 1933; that is, the extraordinary peak in bond yields in June 1932 may be compared with the reference trough of March 1933. We make this comparison in Table 2, chiefly to preserve objectivity.

[12] In making such a test, each past year must be treated strictly as if it were a current year, and the seasonal factors applied to that year must therefore be estimated on the basis of preceding years; but it will be difficult here as elsewhere not to be influenced by 'hindsight'.

[13] Series entered on lines 33, 34, 35, 45 and 53. Perhaps Carl Snyder's index of deposits activity also belongs in this group; it is regarded thus by Snyder.

[14] Perhaps the most promising thing that might be done along these lines is to start with the hypothesis that the new orders placed today will be the output of tomorrow, and that a forecasting index might therefore be made by combining reports on orders in many lines of business, including also contracts for construction. In analyzing time series we have found the rough rule to hold, that orders for commodities and construction con-

to us less promising than efforts to learn about the interrelations among the cyclical movements of different economic processes. Towards this end the National Bureau has been making a detailed analysis of cyclical fluctuations as registered in time series covering many years in this country and Western Europe. If these efforts prosper, they should become a better guide than we have at present to the best methods of anticipating the future.

To sum up: Table 2 demonstrates that the cyclical upturns in a considerable number of American time series have been distributed fairly consistently around the months that we have selected as reference dates for revival. Certain series have led most or all of the dates with which comparisons can be made; but they have led by intervals that have varied from one instance to the next. Because of these variations, we cannot trust the indications of any single series concerning the month which will later be chosen as the reference date around which the revival centered. The least unsafe way to form judgments about this future date is to follow with care the current movements of a collection of series representing different types of economic activity and selected on the basis of the relative regularity with which they have turned upward in earlier revivals.

The chief hazard in forming judgments from such a collection is that cyclical depressions not uncommonly end in a 'double bottom'. Several of the depressions of which we have fair statistical knowledge show two troughs about equally low separated by a mild upturn. The behavior of general business in 1932-33 is a notable example. Business reached a trough about July 1932, experienced a substantial upturn in the autumn, a relapse in the winter, and a new low point in March 1933. A large proportion of the most trustworthy indicators of business conditions participated in the abortive upturn of the autumn of 1932 and in the relapse that followed.

(footnote[14] concluded)

tracts make cyclical upturns and downturns before corresponding reference dates for revivals and recessions. But the data on orders now available are so scanty that the most important practical problem is to extend the scope of such data and to supplement them with data on cancellations. A person who attempted to construct an index of orders would want to give careful attention to the rate of growth of the industries covered. If he found, for example, that declining industries are excessively numerous in his sample, he would perhaps find it desirable to assign a weight to them smaller than is suggested by their gross or net output. The large erratic fluctuations found in most series on orders are another source of difficulty; it may prove desirable to take also this factor into account in assigning weights, series with relatively mild erratic fluctuations receiving increased weight and series with exceptionally violent erratic fluctuations receiving reduced weight. It is not worth while to carry speculation very far at this time. But it should be noticed that a good index of orders is likely to prove a better forecaster of business-cycle recessions than of business-cycle revivals.

So far as we know, there is no certain way of telling at the time it begins whether an incipient revival will suffer a relapse or develop into a cyclical expansion. Yet the occasions are frequent when speculation about the future course of business is demanded by pressing present needs.[15] Those whose hard duty it is to make these guesses have the best chance of being substantially right if they combine analysis of current business data with some knowledge of the history of business cycles, such information as is available concerning important factors arising outside the realm of business, and a firm determination not to let their hopes and fears color their judgments more than is inevitable.

[15] Henry S. Dennison, one of the Directors of the National Bureau who knows the necessity and the difficulty of business forecasting from long experience, points out the close analogy between the problems of an executive confronting a cyclical contraction and a physician treating an illness.

"Thousands of business men," Mr. Dennison writes, "are taking and must take steps based upon their diagnoses of the situation and their prognoses of what is to come. They may be willing or unwilling, well or ill equipped, act consciously or unconsciously, they still must act. No two cycles are alike,—neither are any two cases of typhoid. The doctor is helped if he knows the 'generality' of cases and all the best (though all imperfect) indicators, yet must watch and treat his one case in hand as unique. So must the business economist and the business manager. The doctor even today must face troubles the causes and exact nature of which are unknown and in which prognosis is uncertain or impossible; some years ago this was true in most of his cases; progress has been made because it *had* to be made."

Announcement

'THE SOCIAL SCIENCES AND THE UNKNOWN FUTURE'

In response to numerous requests the National Bureau has reprinted the introductory chapter of Frederick R. Macaulay's *Some Theoretical Problems suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856* (586 pp., 33 tables, 32 charts, $5). It believes that many readers of 'The Social Sciences and the Unknown Future' will wish to see how Dr. Macaulay solves the problems he there raises. A charming quotation from Chesterton gives a partial clue to the nature of these solutions; the table of contents indicates the field covered by the analysis; Dr. Mitchell's Preface warns the reader to note carefully the philosophic relation of Chapter I to the particular problems presented later in the book.

Subscribers wishing to do the National Bureau a good turn can stimulate their friends' interest in its work by sending them copies of this booklet. The National Bureau will attend to mailing for its subscribers (at 25 cents a copy, post-paid) to all lists of 10 or more. Single copies cost 35 cents.

National Bureau of Economic Research

BULLETIN 70

SEPTEMBER 25, 1938

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Employment Opportunities in Manufacturing Industries of the United States

FREDERICK C. MILLS

Copyright 1938, National Bureau of Economic Research, Inc.

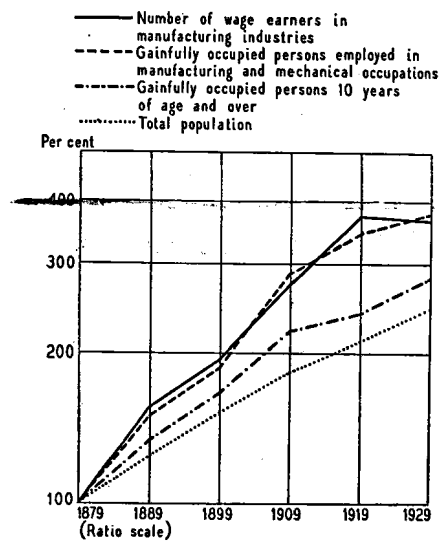
The record of the economic development of the United States, up to 1919, shows a steady increase in the proportion of the population engaged in manufacturing industries. From the first settlement of this country extractive industries engaged a large part of the working population, but with diversification of our economic activities processes of fabrication steadily advanced in importance. More manufactured goods were consumed, export markets expanded, and production grew correspondingly. Employment opportunities were multiplied with this expansion. Manufacturing provided occupations for a growing proportion of a rapidly increasing population.

Changes in employment in manufacturing industries, and in manufacturing and mechanical occupations combined, are indicated in Table 1 and in Figure I. The steady growth of employment in manufacturing industries, relatively to total employment and to the total population, reached a peak in 1919. The drop from 1919 to 1929, a drop the more significant because it paralleled a notable expansion in manufacturing production, constituted at least a temporary reversal of a century-old movement. Although exceptional conditions prevailing in 1919 may have influenced the record of the immediate post-War period, detailed statistics of the last two decades appear to confirm the conclusion that the shift was due to deep-seated causes that may be expected to exert a continuing influence on our economic development.

This change is of clear importance in an industrial country in which approximately one-fifth of all gainfully occupied persons have found employment in manufacturing industries. The tendencies that have prevailed in recent years and the circumstances that may have contributed to the decline in employment opportunities in manufacturing call for investigation, if we are to understand the present situation. Our first concern is with changes in the volume of employment and with related developments during the three decades from 1899 to 1929. When this background has been sketched in, changes in more recent years may be analyzed in greater detail.

Figure I

Changes in Employment in Manufacturing Industries and in Manufacturing and Mechanical Occupations, in Relation to the Growth of the Population and the Total Number of Gainfully Occupied Persons in the United States, 1879-1929



I

CHANGES IN THE NUMBER OF WAGE EARNERS AND SALARIED WORKERS IN AMERICAN MANUFACTURING INDUSTRIES, 1899-1929

The steady advance in manufacturing employment to 1919, the drop during the recession that followed and the rise thereafter to a new peak in 1929 (a peak below the 1919

Table 1

Relative Changes in Employment in Manufacturing Industries and in Manufacturing and Mechanical Occupations, 1879-1929[1]

	1879	*1889*	*1899*	*1909*	*1919*	*1929*
Wage earners in manufacturing industries	100	156	194	272	373	366
Gainfully occupied persons 10 yrs. of age and over	100	134	167	220	239	281
Total population	100	125	152	183	211	245
Wage earners in manufacturing industries as a percentage of:						
Gainfully occupied persons 10 yrs. of age and over	15.7	18.2	16.2[2]	17.3	21.6	18.1
Total population	5.4	6.8	6.2[2]	7.2	8.5	7.2
Gainfully occupied persons employed in manufacturing and mechanical occupations[3]	100	150	187	286	344	378
Gainfully occupied persons in manufacturing and mechanical occupations as a percentage of:						
Gainfully occupied persons 10 yrs. of age and over	21.8	24.4	24.4	27.9	30.8	28.9
Total population	7.5	9.1	9.3	11.6	12.1	11.5

SOURCES: *Census of Manufactures, 1929,* p. 14; *Census of Occupations, 1910,* p. 41, *1930,* p. 6; *Statistical Abstract, 1911,* p. 707, *1936,* pp. 5, 39, 55. The reader should note that there is a slight discrepancy in time between the taking of the census of manufactures and the census of occupations. The 1929 figures for manufactures relate to the average number of wage earners employed during the year; the census of occupations was taken as of April 1930.

[1] The percentages in lines 4, 5, 7, and 8 are affected somewhat by changes in Census classifications. Correction has been made for these changes in computing the measurements in Table 1.

[3] Gainfully occupied persons employed in manufacturing and mechanical occupations include, in addition to wage earners in manufacturing industries, salaried workers and proprietors in manufacturing industries and gainfully occupied persons in a variety of mechanical but non-manufacturing occupations. Important among the latter are automobile service industries (garages), electric light and power plants, construction industries, etc. Employment in some of these industries increased sharply between 1919 and 1929.

[2] Beginning with 1899 the Census of Manufactures excluded hand and neighborhood industries. For 1899, however, we have a figure for the number of wage earners in manufacturing industries that is comparable to those for preceding censuses. This figure, as a percentage of gainfully occupied persons 10 years of age and over, is 18.3; as a percentage of total population, 7.0.

level) are traced in Table 2. Over the twenty years from 1899 to 1919 the total number of employees in manufacturing establishments more than doubled. The number of salaried employees advanced much more rapidly than the number of wage earners. (Some part of the increase in salaried employees corresponds to a decline in the number of independent proprietors, as individual enterprises and partnerships became incorporated.) A considerable part of the increase occurred during the War years. The succeeding decade brought a drop, in the 1920-21 recession; fluctuations thereafter failed to regain the 1919 level. The wage-earning group ended the decade with a net loss of 161,000; salaried workers showed a net gain of 20,000. For the two groups combined there was a loss of 141,000.

Table 2 reveals the changes over three decades in the number of persons employed in manufacturing establishments, but it is not an accurate record of changes in the true volume of employment in the sense of aggregate labor time expended by employees in the output of manufactured goods; for this period was marked by a steady shortening of the average work week. A normal week in 1899 included approximately 59 working hours for wage earners; in 1929 the normal week was less than 51 hours, a decline of more than 14 per cent. We do not have exact figures on the number of hours worked in different Census years, but by

Table 2

Changes in Numbers Employed in Manufacturing Industries, 1899-1929

	WAGE EARNERS		SALARIED EMPLOYEES		TOTAL EMPLOYEES	
YEAR	Absolute (*in thousands*)	Relative	Absolute (*in thousands*)	Relative	Absolute (*in thousands*)	Relative
1899	4,713	100.0	364	100.0	5,077	100.0
1904	5,468	116.0	520	142.9	5,988	117.9
1909	6,615	140.4	790	217.0	7,405	145.9
1914	7,024	149.0	963	264.6	7,987	157.3
1919	9,000[1]	191.9	1,431[2]	395.1	10,431[1,2]	206.5
1921	6,947	148.1	1,146	316.4	8,093	160.2
1923	8,778	187.2	1,269[3]	374.1	10,047[3]	200.6
1925	8,384	178.8	1,256	370.3	9,640	192.5
1927	8,350	178.0	1,301	383.5	9,651	192.7
1929	8,839	188.5	1,359	400.6	10,198	203.6
Percentage change, 1919-29		—1.8		+1.4		—1.6

[1] Beginning with 1919 this series excludes wage earners in establishments with products valued at less than $5,000. In 1919 wage earners excluded numbered 46,000. The series of relatives is adjusted for this change.

[2] Beginning with 1919 this series excludes salaried employees in establishments with products valued at less than $5,000. In 1919 salaried employees excluded numbered 7,000, as estimated from the proportion of wage earners excluded in 1919. The series of relatives is adjusted for this change.

[3] Beginning with 1923 this series excludes employees of central administrative offices. In 1923 the employees thus excluded numbered 86,000. The series of relatives is adjusted for this change.

Table 3

Average Normal Working Hours and Total Employment of Wage Earners in Manufacturing Industries, 1899-1929

YEAR	WAGE EARNERS		AVERAGE NORMAL HOURS WORKED PER WEEK[1]		TOTAL EMPLOYMENT IN MAN HOURS PER WEEK (*estimated*)		TOTAL POPULATION
	Absolute (*in thousands*)	Relative	Absolute	Relative	Absolute (*in millions*)	Relative	Relative
1899	4,713	100.0	59.1	100.0	278.5	100.0	100.0
1904	5,468	116.0	57.7	97.6	315.5	113.2	
1909	6,615	140.4	56.8	96.1	375.7	134.9	121.0
1914	7,024	149.0	55.2	93.4	387.7	139.2	
1919	9,000[2]	191.9	52.3	88.5	470.7[2]	169.8	139.1
1921	6,947	148.1	50.7	85.8	352.2	127.1	
1923	8,778	187.2	51.0	86.3	447.7	161.6	
1925	8,384	178.8	50.3	85.1	421.7	152.2	
1927	8,350	178.0	50.3	85.1	420.0	151.5	
1929	8,839	188.5	50.6	85.6	447.3	161.4	161.6
Percentage change, 1919-29		—1.8		—3.3		—4.9	+16.2

[1] For the period 1899-1925 this series is taken from Paul H. Douglas, *Real Wages in the United States, 1890-1926* (Houghton Mifflin Co., 1930), p. 116; the 1929 figure is computed from Census of Manufactures data; the 1927 figure is obtained by interpolation based on actual hours worked per week, as estimated by the National Industrial Conference Board.

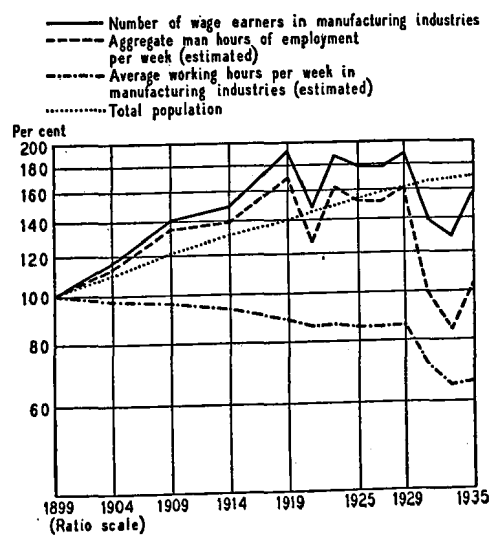
[2] Beginning with 1919 this series excludes wage earners in establishments with products valued at less than $5,000. Wage earners excluded in 1919 numbered 46,000. The series of relatives is adjusted for this change.

taking account of changes in 'normal' working hours[1] we may secure fairly satisfactory estimates of the total volume of employment, measured in man hours (Table 3 and Figure II).

Peak employment came in 1919, with volume about 69 per cent greater than in 1899. This peak was not reattained during the decade that followed; employment in 1929 was approximately 5 per cent less than in 1919.[2] In the prosperous years 1923, 1925, and 1929, however, the volume of manufacturing production materially exceeded that of 1919. But over this period man-power was not the major instrument in expanding output. Even in the bulge of industrial prosperity of the 1920's there were signs of the tendency, so pronounced in more recent years, toward a lessening of employment opportunities in manufacturing industries. These changes in manufacturing employment are the more pronounced when compared with the total population of the country. From 1899 to 1919 the rate of increase in total number of man hours worked in manufacturing industries was materially greater than the rate of growth of population. But from 1919 to 1929, when population increased 16 per cent (17 millions in absolute terms), the total employment of wage earners in manufacturing plants declined 5 per cent. If the discrepancy be-

Figure II

Growth of Total Population and Employment Changes in Manufacturing Industries of the United States, 1899-1935



[1] Actual working hours may vary from 'normal' hours because of over-time and part-time employment. Seasonal variations in the working week would be expected to cancel out within the year, and would not affect the annual averages here given. Variations due to cyclical influences, or to other non-seasonal vicissitudes of business, would not in general be thus offset within the year. For this reason the 'normal' hours cited in Table 3 may be above actual working hours in some years, below in others. The general trend over the thirty-year period, however, would not be materially affected by these variations.

[2] The computation of total employment with reference to normal or nominal working hours possibly understates slightly the actual changes over the period covered in Table 3. The National Industrial Conference Board has estimated the actual changes in hours worked per week in manufacturing industries, modifying Douglas' nominal hours correspondingly (*Conference Board Bulletin*, February 25, 1937). The modified series shows a drop from 1899 to 1919 of 11.4 per cent in average actual hours worked per week; from 1899 to 1929 the drop is estimated at 15 per cent. Relatives measuring changes in total employment (man hours per week), on the 1899 base, become 170.0 for 1919, 160.2 for 1929, when computed from the modified data of average weekly hours. These differ but slightly from the figures in Table 3.

tween these two figures had been due solely to a secular decline in hours per week associated with full employment, no contraction in employment opportunities would be indicated. This was not the case, however. Volume of manufacturing employment, even when corrected for changes in normal hours, failed to advance with population after 1919. Important economic readjustments were necessitated by the change in the relations between these two series.[2]

The explanation of this notable shift is to be found, in part, in fundamental technical changes that have speeded up the process of mechanization. We know that technical improvements of almost infinite variety have occurred in processes of fabrication. We may roughly estimate the importance of these improvements by measuring over-all changes in industrial productivity, but in their detail they elude our instruments of reckoning. In less degree, probably, explanation of the changed conditions in manufacturing is to be found in other internal shifts in the structure of manufacturing—changes in the character of products turned out, in the relative importance of different industries, in the part played by capital equipment in manufacturing operations.

In defining the background of the changes during recent disturbed years, certain of these movements may be briefly traced. Our first concern is with changes in productivity (see Table 4 and Figure III). The story told by the measurements in Table 4, which relate to a sample of manufacturing industries, not to the total, may be followed most readily in terms of the figures defining percentage changes by decades. Total output advanced more than 50 per cent in the first of the three decades covered, slightly less than 50 per cent in the second, and 42 per cent in the third. The

[2] We have noted that the year 1919 was in some respects exceptional. War-time demands had been heavy on manufacturing industries. At the close of the War there was a hasty shift back to production for civilian purposes, particularly the production of consumer goods. However, the record of the intervening years supports the above interpretation of the movements of the period 1919-29. From 1923 to 1929 manufacturing production increased some 18 per cent; the number of employed wage earners, in the sample to which these production figures relate, declined 3 per cent; total man hours declined 4 per cent. If expansions in output serve to offset advancing productivity, as was roughly true from 1923 to 1929, the problem of readjustment involves the inter-industrial transference of labor, within manufacturing as a whole, and the allocation to non-manufacturing industries of the man-power coming on the market each year as a result of population growth. In periods of declining output or of less rapid increase in production the problem takes a more acute form.

Table 4

Productivity per Wage Earner and per Man Hour in Manufacturing Industries, 1899-1929

(estimates based upon study of a sample of Census industries[1])

YEAR	PRODUCTION	WAGE EARNERS	EMPLOYMENT IN MAN HOURS	PRODUCTIVITY PER Wage earner	PRODUCTIVITY PER Man hour	ALL EMPLOYEES (WAGE EARNERS AND SALARIED WORKERS)	PRODUCTIVITY PER EMPLOYEE, INCL. SALARIED WORKERS
1899	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1904	120.2	108.1	105.5	111.2	113.9	109.9	109.4
1909	154.5	130.0	124.9	118.8	123.7	135.3	114.2
1914	176.3	136.1	127.1	129.5	138.7	143.7	122.7
1919	228.3	167.8	148.5	136.1	153.7	180.6	126.4
1921	184.2	134.3	115.2	137.2	159.9	145.2	126.9
1923	274.7	174.5	150.6	157.4	182.4	187.0	146.9
1925	281.2	165.4	140.8	170.0	199.7	178.1	157.9
1927	287.9	162.6	138.4	177.1	208.0	176.0	163.6
1929	323.9	168.5	144.2	192.2	224.6	182.0	178.0
Percentage change							
1899-1909	+54	+30	+25	+19	+24	+35	+14
1909-1919	+48	+29	+19	+15	+24	+33	+11
1919-1929	+42	+0.4	−3	+41	+46	+1	+41

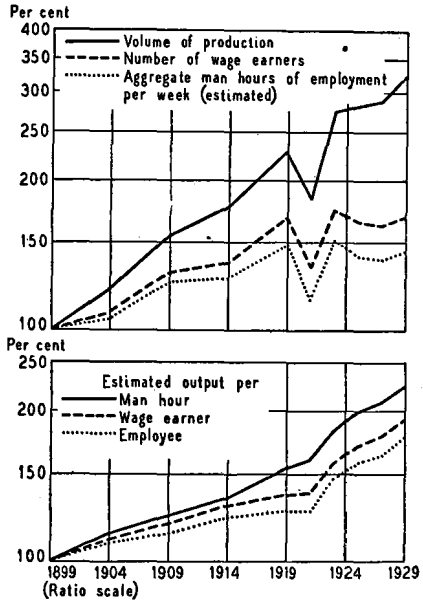
[1] The following figures indicate the relative size of the sample in 1929:

	SAMPLE	CENSUS	SAMPLE AS PERCENTAGE OF TOTAL CENSUS
Number of wage earners (in thousands)	4,289	8,839	48.5
Value of product (in millions)	$36,836	$70,435	52.3
Value added (in millions)	$14,126	$31,885	44.3

Corresponding percentages for 1899, in the order given above, are 32.5, 36.9, 28.1.

The index of manufacturing production in Table 4 is an index of physical output derived from Census of Manufactures data. Weights are based on value added in manufacture. Details concerning the method of construction and the data employed are given in *Economic Tendencies in the United States* (National Bureau of Economic Research, 1932), Ch. I, V, VI, and Ap. IV. Minor modifications have been made in subsequent revisions of the index.

Figure III
Production, Employment, and Productivity in Manufacturing Industries of the United States, 1899-1929
(based upon study of a sample of Census industries)



growth in each decade was substantial.[4] Employment in manufacturing industries advanced materially during the first two decades. This is true whether employment is measured in terms of wage earners employed, total man hours worked, or total employees. The advance in employment was less than in output, for productivity was growing, but there was no appreciable falling off in the rate of growth in employment opportunities from the first decade to the second.

The record of changes in production and productivity from 1919 to 1929 explains, in some degree, the decline in employment opportunities already noted. Total production continued to expand; employment did not. But industrial productivity made a tremendous advance. In the sample of manufacturing industries here included, a sample covering almost one-half of all manufacturing industries in 1929, output per employee increased 41 per cent from 1919 to 1929; output per wage earner advanced equally; output per man hour increased 46 per cent. The complex of causes that underlie these changes in productivity played an important part in the changing employment situation in manufacturing industries.[5]

This does not mean that we shall find a simple inverse relationship between changes in productivity and in employment, in the records of manufacturing operations. Pro-

[4] The moderate decline in the rate of increase, from decade to decade, is probably a reflection of the limitations of the sample, rather than evidence of a true check to the rate of advance in total output. In the nature of things a sample is limited to a relatively fixed group of industries. New industries coming into being during the period covered by a given study are generally excluded, if comparable measurements for the whole period are sought. In the present case some account has been taken of new industries, by splicing figures defining Census-to-Census changes, but it cannot be said that the full diversification of manufacturing activities between 1899 and 1929 is reflected in the series presented in Table 4.

Comparison of Tables 2, 3, and 4 reveals that employment advanced more rapidly in all manufacturing industries than in the industries included in the sample on which the entries in Table 4 are based. It is certain that total production increased more rapidly than is indicated by the production series in Table 4.

Our chief purpose in Table 4, however, is to define changes in productivity. Measurements of such changes are probably not materially affected by the limitations attaching to the present sample.

[5] 'Productivity' as here used in the sense of average output per employee or per man hour is of course not to be confused with the 'specific productivity' of economic theory.

Table 5
Changes in Employment, Production, and Productivity, 1914-1929
Major Groups of Manufacturing Industries
(estimates based upon study of a sample of Census industries[1])

INDUSTRIAL GROUP	PERCENTAGE CHANGES FROM 1914 TO 1929: Volume of production	No. of wage earners	Estimated output per wage earner
All industries	+84	+24	+48
Goods for human consumption	+78	+23	+44
Capital equipment goods, excl. construction materials	+143	+45	+67
Construction materials	+55	+12	+38
Foods	+55	+19	+29
Non-foods	+91	+24	+53
Durable goods	+111	+30	+62
Semi-durable goods	+62	+18	+38
Perishable goods	+71	+71	+36

[1] The actual numbers of wage earners employed in 1929 in industries within the several major groups here named are given below, in thousands:

	SAMPLE	CENSUS	SAMPLE AS PERCENTAGE OF TOTAL CENSUS
Goods for human consumption	3,175	4,900	64.8
Capital equipment goods, excl. construction materials	469	2,132	22.0
Construction materials	591	1,021	57.9
Foods	662		
Non-foods	3,627		
Durable goods	1,437	4,357	33.0
Semi-durable goods	1,908	2,427	78.6
Perishable goods	890	2,055	45.9
Total	4,289	8,839	48.5

Employees in some of the minor groups have been excluded from certain of the categories set up above. For this reason, the totals do not in all cases equal the sums of the group figures.

ductivity may advance with advancing production and increasing employment; it may advance when production is being maintained at a constant level, and employment is declining. Behind the records of employment and output lie cost factors, price policies, conditions of demand, and other elements affecting the activities of manufacturing industries.

Changes in the employment of wage earners, in output, and in productivity for important classes of manufacturing industries during 1914-29 are defined by the entries in Table 5. Within this period previous employment trends were apparently reversed; the more detailed record should be studied with this fact in mind.[6] In the first division of industries we find rather wide differences in the degrees of change in employment between 1914 and 1929. Industries producing capital equipment showed the greatest increase in number of wage earners employed. The gains were materially smaller for industries producing construction materials and goods for human consumption. But it was precisely in the first group that output per worker and total output had increased most rapidly. Conditions not here measured (e.g., favorable market conditions) may be assumed to have facilitated concurrent gains in productivity, total output, and employment. The important point to note is that enhanced productivity did not mean reduced employment. The other classifications showed somewhat the same results, though in less pronounced form. Where productivity advanced most, output and employment showed the greatest increases. This is true of non-foods, in one division, of durable goods, in another.[7]

II

EMPLOYMENT DURING RECESSION AND RECOVERY, 1927-1935

In the preceding review of changes in employment and related factors in the manufacturing industries of the United States we have noted certain modifications of tendencies that had characterized the industrial development of the nineteenth century. Notably, employment in manufacturing industries, which had provided opportunities for millions of immigrants and new generations of native-born workers, was ceasing to grow with an expanding population, was even contracting during an era of exceptional industrial prosperity. The forces of the recession that began in 1929 were loosed upon a manufacturing system in which these movements had been proceeding for a decade or more. During this recession some of the secular shifts that were slowly modifying the character of manufacturing operations were accentuated, while quite new factors worked changes of their own. In this disturbed time the structure of manufacturing production was under great pressure. Employment conditions, character of demand, and technical methods were modified. Our present concern is with changes in employment, and with related circumstances, during these years of economic strain. In tracing certain of these changes it seems well to include the two years prior to the beginning of the recession.

The general picture of changes in employment in manufacturing industries during this period is given in Table 6 and in Figure II. An advance from 1927 to 1929 of slightly less than 6 per cent in the number of manufacturing employees was followed by drastic reductions over the four succeeding years. The number of wage earners employed was reduced, from 1929 to 1933, by 2,783,000, about 31 per cent of the 1929 working force. (In the last previous major recession, from 1919 to 1921, employed wage earners had declined 2,053,000 in number, or 23 per cent.) By 1935 the situation had been improved by the employment

[6] The year 1914 is here employed as base, rather than 1919, because of the influence of the War-time expansion on conditions in the later year.

[7] The following table throws light on the relation between changes in productivity and changes in employment, between 1914 and 1929:

	INDUSTRIES IN WHICH THE NUMBER OF EMPLOYED WAGE EARNERS		TOTAL
	Increased	Decreased	
Industries in which output per wage earner			
Increased	31	22	53
Decreased	0	1	1
Total	31	23	54

Employment increased in 31 of the 53 industries in which productivity advanced between 1914 and 1929, decreased in the one industry (the manufacture of organs) that was marked by declining productivity.

Table 6

Changes in Numbers Employed in Manufacturing Industries, 1927-1935

(data relate to all manufacturing industries covered by the Census of Manufactures[1])

YEAR	WAGE EARNERS		SALARIED EMPLOYEES		TOTAL EMPLOYEES	
	Absolute (*in thousands*)	Relative	Absolute (*in thousands*)	Relative	Absolute (*in thousands*)	Relative
1927	8,350	100.0	1,301	100.0	9,651	100.0
1929	8,839	105.9	1,359	104.5	10,198	105.7
1931	6,507	78.1	([2])	([2])	.....	.....
1933	6,056	72.7	([2])	([2])	.....	.....
1935	7,379	88.5	1,076	82.7	8,455	87.7
Change 1929-33	−2,783	−31.5				
1933-35	+1,323	+21.7				
1929-35	−1,460	−16.5	−283	−20.9	−1,743	−17.0

[1] The absolute figures given above for different years are not strictly comparable. After 1929 the Bureau of the Census excluded motion pictures and poultry killing from the category 'manufacturing industries'; light repair work in steam railroad shops was similarly excluded after 1933. The magnitudes involved in these shifts are, relatively, quite small.

[2] Complete data on salaried employees were not collected in 1931 and 1933.

of 1,323,000 more workers than in 1933, but there remained a net loss from 1929 of 1,460,000 persons. The total decrease in the number of employees between 1929 and 1935, counting salaried employees as well as wage earners, was 1,743,000.

Here, as in dealing with the record of employment changes in an earlier period, we must take account of changes in the length of the average work week. Such changes were of particular importance during certain stages of the depression and recovery and, indeed, their effects persisted in the form of a materially shortened work week in industry in general. In tracing these movements we deal with the employment of wage earners alone (Table 7 and Figure II).

Table 7

Average Actual Working Hours and Total Employment of Wage Earners in Manufacturing Industries, 1927-1935

	WAGE EARNERS		AVERAGE ACTUAL HOURS WORKED PER WEEK[1]		TOTAL EMPLOYMENT IN MAN HOURS PER WEEK (*estimated*)	
YEAR	Absolute (*in thousands*)	Relative	Absolute	Relative	Absolute (*in millions*)	Relative
1927	8,350	100.0	47.7	100.0	398.3	100.0
1929	8,839	105.9	48.3	101.3	426.9	107.2
1931	6,507	77.9	40.4	84.7	262.9	66.0
1933	6,056	72.5	36.4	76.3	220.4	55.3
1935	7,379	88.4	37.2	78.0	274.5	68.9
Change						
1929-33		—31.5		—24.7		—48.4
1933-35		+21.7		+2.2		+24.6
1929-35		—16.5		—23.0		—35.7

[1] The measurements of average actual hours worked per week are those of the National Industrial Conference Board (see *Conference Board Bulletin,* February 25, 1937). This is the only continuous series going back to 1927. The National Industrial Conference Board sample includes establishments selected from 25 industries; these 25 industries covered 48 per cent of all wage earners in 1929. A similar series compiled by the U.S. Bureau of Labor Statistics for the period since 1933 shows a slightly higher value for 1933 (37.9), a slightly lower value for 1935 (36.6). Use of the Bureau of Labor Statistics series would give total employment figures, in man hours, showing an advance of 17.5 per cent between 1933 and 1935, as against the gain of 24.6 per cent given in Table 7.

From 1927 to 1929 there was a slight increase in the length of the average work week, a more considerable increase in the number of employed wage earners. The four succeeding years brought a drop of 25 per cent in working hours per week, from 48.3 to 36.4, paralleling the decline of 31 per cent in the number of wage earners employed. The result was a drop of 48 per cent in total man hours worked per week in American manufacturing industries. This represented a loss, in absolute terms, of approximately 206 million working hours per week. The effective volume of employment in manufacturing industries was reduced approximately one-half. From 1933 to 1935 there was a gain of some 54 million man hours per week, reflecting, primarily, an increase in the number of employed workers. The number of hours worked per week changed but slightly.

The net changes from 1929 to 1935 are perhaps of chief interest, in considering the outlook for the future. While manufacturing output declined about 13 per cent, the number of salaried workers was reduced 20 per cent, and the number of wage earners 16 per cent. In number, wage earners declined 1,460,000. Total employment of wage earners fell approximately 152 million man hours per week, or about 36 per cent. Of this drop, slightly less than one-half represented the reduction in number of wage earners, while slightly more than one-half represented the reduction in the working hours of employed wage earners.

Part of the failure of employment to recover to the 1929 level was due, of course, to the failure of manufacturing production to regain the pre-recession level. Many industries remained, in 1935, at depression levels of activity. Some part of the reduction in employment reflected an advance in industrial productivity that enabled a smaller working force to produce a given volume of output. We should attempt to distinguish between these two elements. Measures of output per man hour are needed for this purpose. Table 8 and Figure IV present comparable measurements of changes in production and employment, and provide estimates of productivity changes. (These figures relate to the sample of manufacturing industries previously referred to; it will be noted that the employment loss in

Table 8

Productivity per Man Hour in Manufacturing Industries, 1929-1935

(estimates based upon study of a sample of Census industries)

	1929	*1931*	*1933*	*1935*
Production[1] (relative)	100.0	75.2	69.7	87.4
Total employment of wage earners in man hours (relative)	100.0	67.1	59.0	68.7
Estimated output per man hour (relative)	100.0	112.1	118.1	127.2

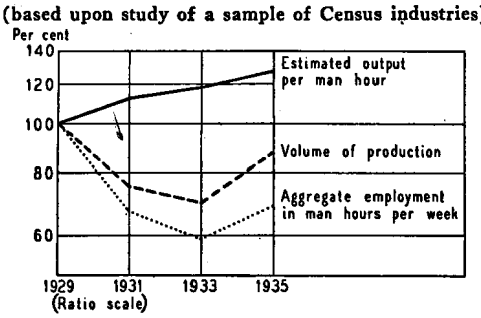
[1] This index of manufacturing production is computed from biennial Census data. We should note that these measurements indicate a decline in manufacturing activity considerably less severe than that shown by the index of the Board of Governors of the Federal Reserve System, given below:

	1929	*1931*	*1933*	*1935*
Index of manufacturing production	100.0	67.2	63.0	75.6

The observed difference between the two indices reflects, primarily, a difference in coverage. The Federal Reserve index, computed monthly, includes output records for the basic industries, which are the ones suffering the most severe losses in a depression. The more comprehensive index based on Census data is rendered relatively stable by the inclusion of a greater variety of industries.

However, employment losses for the sample to which the production index relates appear to have been smaller than those for all Census industries. An index of production estimated from the more comprehensive employment figures is 81.7 for 1935, on the 1929 base.

Figure IV
Production, Employment, and Productivity in Manufacturing Industries of the United States, 1929-1935
(based upon study of a sample of Census industries)



this sample from 1929 to 1935 was less than that shown by Table 7, which relates to all manufacturing industries.) These measurements indicate a gain of 27 per cent in output per man hour, from 1929 to 1935.

From these records we derive the following estimates of employment changes between 1929 and 1935. The estimates relate to all manufacturing industries, the assumption being made that changes in volume of production, average hours worked, and productivity per man hour in all industries paralleled the changes in the sample we have been able to study in detail.

	ALL MANUFACTURING INDUSTRIES
Estimated reduction between 1929 and 1935 in aggregate number of man hours per week:	
Worked by wage earners in manufacturing plants	152,425,000
Required to produce the 1929 volume of physical output	91,292,000
Required to produce the 1935 volume of physical output	74,664,000

These figures, and those previously presented, lead to the following conclusions concerning the employment changes in American manufacturing industries between 1929 and 1935.

1) The number of employed wage earners declined 1,460,000. This represents a loss of 16.5 per cent of the number employed in 1929. In addition, the number of salaried employees declined 283,000.

2) The aggregate number of man hours worked per week by wage earners declined 152,425,000. This represents a loss of 35.7 per cent of total manufacturing employment in 1929, measured in man hours per week.

3) The decline in aggregate man hours per week, which is a true measure of the loss in actual employment, represents the labor of 3,156,000 men, working 48.3 hours per week (the 1929 average). The actual reduction in men employed was 1,460,000. The reduction in the length of the working week accounts, arithmetically, for the difference of 1,696,000.[8]

[8] Since many other factors and relations are involved, it would be wrong to conclude that if the 1929 working week of 48.3 hours had been retained, 1,696,000 more men would necessarily have been displaced between 1929 and 1935.

4) Because of advancing productivity in manufacturing industries there was a decline, between 1929 and 1935, of approximately 91,292,000 in the number of man hours per week required to produce the volume of manufactured goods turned out in 1929. This may be thought of as a *potential* consequence of the advance in productivity between 1929 and 1935, since it represents the loss in employment that would have been suffered had the 1929 level of output been restored in 1935, with man hour output equal to that actually prevailing in 1935.[9]

5) There was a decline between 1929 and 1935 of approximately 74,664,000 in the number of man hours per week required to produce the volume of manufactured goods turned out in 1935. This figure represents 49.0 per cent of the total decline of employment (in man hours) between 1929 and 1935. Without going into the causal relations involved, this may be taken to measure the loss of employment directly associated with rising productivity, with reference to the level of output actually prevailing in 1935.

6) If the 1929 level of production had prevailed in 1935, at the rate of man hour output recorded in 1935, some 336 million man hours would have sufficed to produce the goods turned out by 427 million man hours in 1929. With a working week of 48.3 hours (that of 1929), this would have meant the employment of 6,957,000 workers, 1,882,000 less than in 1929.[10] This is a measure of the potential loss in employment as a result of advancing productivity, when no account is taken of changes in hours of work or in demand.

7) If the 1929 level of production had prevailed in 1935, at the rate of man hour output recorded in 1935, and with the 1935 working week of 37.2 hours, some 9,022,000 workers would have been employed. This figure exceeds by almost 200,000 the number of workers employed in manufacturing industries in 1929. In terms of the number of persons that could be employed, the reduction in working hours per week between 1929 and 1935 more than counterbalanced the loss of employment that might have resulted from rising productivity, if the sole effect of productivity gains had been the displacement of workers.

[9] It is impossible, of course, to say what the rate of output per man hour would have been in 1935 if the volume of manufacturing production had equaled that of 1929. Output per man hour is not independent of the level of output. If one may judge from the experience of other periods of revival, higher productivity is to be expected as the level of output advances after a depression. (See, for example, the productivity measurements for 1921 and 1923, and those for 1927 and 1929, in Table 4.) If we are justified in assuming that greater output per man hour would have been associated with a higher level of production in 1935, the above estimate of potential reduction in employment is conservative. The present purpose, however, is not to present a definitive figure, but to obtain some idea of the relative magnitudes involved.

[10] Some part of the advance in the rate of man hour output between 1929 and 1935 may have been due to the shortening of the average working week by 11.1 hours. To the extent that this was true, the estimates in this paragraph would be altered, since there is an implicit assumption that man-hour productivity would have been the same with a working week of 48.3 hours as with one of 37.2 hours.

The record of employment changes from 1929 to 1935 is complicated by the interplay of three major factors. A decline in output accounted for a substantial part of the net loss; enhanced productivity contributed to the lessened demand for workers; a sharp reduction in the average length of the working week affected the incidence of unemployment resulting from decreased activity and increased productivity. Although the failure of important manufacturing industries to regain their pre-recession level of output was an important element of the 1935 employment situation, it is clear that the employment tendencies discernible during 1919-29 persisted after 1929. The wants of consumers of manufactured goods could be met, on the established level, with a steadily declining quantity of human labor. Labor time was being released as a result of steady advances in productivity. Whether this time was to be used for the production of a greater quantity of manufactured goods or for the production of goods and services of other types, or was to be utilized as leisure by the working population was dependent on considerations beyond our immediate concern.

To understand recent employment changes we must go beyond the general measurements for all manufacturing industries. We proceed in the next section to an examination of shifts in important industrial groups.

III

CHANGES IN EMPLOYMENT BY INDUSTRIAL GROUPS, 1927-1935

Manufacturing industries are classified under 15 heads by the Bureau of the Census. The nature of some of the employment shifts of recent years is revealed by a survey of the changes in these several broad divisions. In Table 9 these movements are shown in relative terms. The absolute importance of each group is indicated by the entries giving the total number of wage earners in the industries in each group in 1927. Employment losses from 1929 to 1933 in these industrial groups range from 9.7 per cent for industries fabricating food products to 51.1 per cent for industries producing machinery. If we arrange the groups according to the degree of change from 1929 to 1933[11] there is a clear progression from the industries producing perishable and semi-durable goods for human consumption to the heavy, equipment-producing industries. By 1935 employment in industries manufacturing foods and paper products was above the 1929 level, and chemicals and textiles had substantially reattained that level. But employment in the fabrication of forest products was still 33 per cent below 1929, and employment conditions in other important heavy industries were only slightly better.

We pass to measurements relating to classifications of maufacturing industries based on the uses and relative durability of their products. As is well known, the declines in production and employment during the stages of sharp recession between 1929 and 1933 were more pronounced among capital goods than among goods intended for consumption, among durable goods than among perishable and semi-durable goods. The changes among these groups from 1929 to 1933 may be studied, in Table 10, with reference to the questions that now concern us.

The absolute decline from 1929 to 1933 in the number of wage earners employed in manufacturing industries approached 2,800,000 (approximately half of this loss had been made up by 1935). Of the four groups represented

[11] In order of change in volume of employment during the recession, we have: foods, leather products, textiles, chemicals, paper and products, tobacco manufactures, products of petroleum and coal, printing and publishing, rubber products, iron and steel, non-ferrous metals, stone, clay, and glass, transportation equipment, forest products, machinery.

Table 9

Employment of Wage Earners by Industrial Groups, 1927-1935

CENSUS GROUPS	1927 Absolute (*in thousands*)	Census Groups[1] 1927	1929	1931	1933	1935	PERCENTAGE CHANGE 1929-1933	1929-1935	1933-1935
Foods	665	100.0	110.9	95.5	100.1	119.9	—9.7	+8.1	+19.8
Tobacco manufactures	369	100.0	89.8	77.2	67.5	70.0	—24.8	—22.0	+3.0
Textiles	1,694	100.0	100.8	83.9	87.0	99.4	—13.7	—1.4	+14.3
Forest products	855	100.0	101.4	59.6	53.1	67.7	—47.6	—33.2	+27.5
Paper and products	224	100.0	104.0	86.7	87.5	105.0	—15.9	+1.0	+20.0
Printing and publishing	329	100.0	108.9	96.4	80.4	93.2	—26.2	—14.4	+15.9
Chemicals	252	100.0	110.7	91.4	94.2	109.6	—14.9	—1.0	+16.3
Products of petroleum and coal	142	100.0	103.9	84.8	78.0	82.0	—24.9	—21.1	+5.1
Rubber products	142	100.0	105.0	69.9	74.8	80.8	—28.8	—23.0	+8.0
Leather and products	316	100.0	100.8	86.3	89.2	98.3	—11.5	—2.5	+10.2
Stone, clay, and glass products	350	100.0	93.8	63.7	49.4	66.6	—47.3	—29.0	+34.8
Iron and steel products	835	100.0	105.5	71.6	66.4	87.8	—37.1	—16.8	+32.2
Non-ferrous metals	273	100.0	115.4	76.6	69.0	95.1	—40.2	—17.5	+38.0
Machinery	893	100.0	123.3	77.7	60.3	88.8	—51.1	—28.0	+47.3
Transportation equipment	495	100.0	117.9	75.5	62.1	97.2	—47.3	—17.6	+56.5

[1] SOURCE: *Biennial Census of Manufactures, 1933*, p. 40; *1935*, p. 42.

Table 10

Employment of Wage Earners, 1929-1935

Major Groups of Manufacturing Industries

INDUSTRIAL GROUP	WAGE EARNERS (*in thousands*)			ABSOLUTE CHANGE (*in thousands*)			RELATIVE CHANGE			GROUP AS PERCENTAGE OF TOTAL		
	1929	1933	1935	1929-1933	1933-1935	1929-1935	1929-1933	1933-1935	1929-1935	1929	1933	1935
Goods for human consumption[1]	4900	3826	4583	−1074	+757	−317	−21.9	+19.8	−6.5	55	63	62
Capital equipment goods, excl. construction materials[2]	2132	1146	1443	−986	+297	−689	−46.3	+25.9	−32.3	24	19	20
Construction materials[3]	1021	517	675	−504	+158	−346	−49.3	+30.6	−33.9	12	9	9
Producers' supplies[4]	786	567	678	−219	+111	−108	−27.9	+19.6	−13.7	9	9	9
Durable goods[5]	4357	2356	3111	−2001	+755	−1246	−45.9	+32.0	−28.6	49	39	42
Semi-durable goods[6]	2427	2064	2361	−363	+297	−66	−15.0	+14.4	−2.7	28	34	32
Perishable goods[7]	2055	1636	1907	−419	+271	−148	−20.4	+16.6	−7.2	23	27	26
Total	8839	6056	7379	−2783	+1323	−1460	−31.5	+21.8	−16.5	100	100	100

[1] Goods intended for human consumption in the form in which sold, or after further processing. Examples: foods, clothing.

[2] Durable goods intended for use in the production of other goods. Examples: agricultural implements, machine tools.

[3] Goods used in industrial or residential construction. Examples: cement, lumber.

[4] Non-durable commodities used in productive processes in manufacturing or other industries. Examples: coke, twine.

[5] Goods with a useful life covering two years or more. Examples: iron and steel, carpets.

[6] Goods not used up in a single act of consumption, but with a useful life covering less than two years. Examples: rubber, clothing.

[7] Goods used up in a single act of consumption. Examples: foods, manufactured gas.

in the first classification, industries producing goods for human consumption contributed most heavily to this total. Relatively, however, the employment losses of this group (22 per cent of the 1929 total) were less than those of industries producing capital equipment and construction goods (which suffered declines of 46 and 49 per cent, respectively). A substantial part of the employment losses of the consumption goods group had been made up by 1935, but employment in industries producing capital equipment and construction materials remained about one-third below the 1929 volume. Of the net loss of 1,460,000 positions in manufacturing industries between 1929 and 1935, about 317,000 may be attributed to employment declines in industries producing consumption goods, while the losses in the other three categories amount to 1,143,000. Yet in 1929 something less than 4,000,000 out of 8,800,000 wage earners in manufacturing had been employed in these other categories. Not only were employment declines heaviest in the non-consumption goods industries; they were out of all proportion to the relative importance of these industries in the economy as a whole. Deficiencies of employment in 1935 were greatest among industries producing capital goods, construction goods, and producers' supplies. Immediate wants were being satisfied, but the instruments of roundabout production that maintain the efficiency of productive effort were being turned out in greatly reduced volume.

The three classes based on the second principle of classi-

Table 11

Average Actual Working Hours and Total Employment of Wage Earners, 1929-1935

Major Groups of Manufacturing Industries

(estimates based upon study of a sample of Census industries)

INDUSTRIAL GROUP	ESTIMATED AVERAGE ACTUAL HOURS WORKED PER WEEK[1]		ESTIMATED AGGREGATE MAN HOURS PER WEEK (*in thousands*)		CHANGES, 1929-1935	
	1929	1935	1929	1935	Absolute (*in thousands*)	Relative (*per cent*)
Goods for human consumption	47.4	36.6	232,260	167,738	−64,522	−27.8
Capital equipment goods, excl. construction materials	49.3	37.0	105,108	53,391	−51,717	−49.2
Construction materials	48.9	37.2	49,927	25,110	−24,817	−49.7
Durable goods	48.7	37.2	212,186	115,729	−96,457	−45.5
Semi-durable goods	47.0	35.7	114,069	84,288	−29,781	−26.1
Perishable goods	48.6	38.5	99,873	73,419	−26,454	−26.5
Total	48.3	37.2	426,924	274,499	−152,425	−35.7

[1] Average actual hours per week per wage earner for subgroups are based on National Industrial Conference Board data for 25 manufacturing industries, weighted by number of wage earners employed, as given by the Census of Manufactures. The total is that of the National Industrial Conference Board. Discrepancies between the sum of the subgroups and the total are due to differences in weighting and to the omission, from the classification based on use, of the subgroup 'Producers' fuels'.

fication reflect similar inequalities. Industries producing durable goods suffered most heavily in the initial decline. Although their gains from 1933 to 1935 were greatest, their net employment losses from 1929 to 1935 remained far greater, both absolutely and relatively, than those of industries producing semi-durable and perishable goods.

When we take account of changes in aggregate working hours per week we obtain a truer picture of the actual industrial changes brought by the events of 1929-35. The best available estimates, by groups, are given in Table 11. The aggregate loss of working time comes to approximately 36 per cent, as against the 16.5 per cent decline in number of wage earners employed. The absolute contributions of the different industrial groups to this total are different from those given in Table 10, as are also the relative changes in the various groups. Of the first three categories, industries producing consumption goods made the largest contribution to the net employment loss, with a decline of 64,522,000 man hours a week, or 27.8 per cent of the 1929 volume of employment in this group. Because of the large number of workers in this group (4,900,000 in 1929) the decline in the average length of the working week brought a substantial reduction in aggregate hours worked. Among industries producing capital goods and construction goods the employment declines were smaller, in absolute terms, but much higher relatively. In each case employment in aggregate man hours per week was reduced approximately one-half between 1929 and 1935.

Among the other groups durable goods suffered the greatest losses, both absolutely and relatively. But the declines in employment in industries producing semi-durable and perishable goods were not inconsiderable. It is notable that in none of the six groups in Table 11 was the loss in actual volume of employment between 1929 and 1935 less than 25 per cent.

These changes in employment are to be interpreted with reference to productivity changes. The measurements in Table 12 are based upon the sample of manufacturing industries previously referred to. They apply with some reservations, therefore, to manufacturing industries as a whole.[12] The productivity gains, by groups, vary widely. The greatest gains occurred among goods destined for human consumption, in one classification, semi-durable and perishable goods in the other. These are the groups in which production in 1935 exceeded or fell only slightly below the 1929 level. High output is conducive to gains in productivity. Declines in output may stimulate more effective internal organization and the installation of better equipment, but the full gains are usually not reached until a high level of production is attained.

[12] The coverage of the sample is indicated by the footnote to Table 5.

It is notable, too, that employment, whether measured in man hours or in number of wage earners employed, has suffered smaller losses among consumption goods, in which productivity advanced substantially, than among capital goods and construction materials, in which the gain in productivity was smaller. These relations, however, call for more extended investigation.

We turn now from the sample returns to estimates relating to all manufacturing industries, seeking to determine the bearing of productivity advances on the actual and potential declines in employment.

The entries in Tables 10 and 11 indicate the magnitude of the actual employment losses between 1929 and 1935. In manufacturing industries as a whole they amounted to 152,425,000 man hours, and to 1,460,000 individual wage earners. A considerable portion of each of these losses reflects an actual decline in production, rather than an en-

Table 12

Relative Changes in Employment, Production, and Productivity, 1929-1935

Major Groups of Manufacturing Industries[1]

(estimates based upon study of a sample of Census industries)

	PERCENTAGE CHANGE FROM 1929 TO 1935			
INDUSTRIAL GROUP	Volume of production	No. of wage earners	Estimated no. of man hours	Estimated output per man hour
Goods for human consumption	—3.6	—3.3	—27.8	+33.5
Capital equipment goods, excl. construction materials	—32.4	—14.1	—40.9	+14.4
Construction materials	—39.3	—29.8	—44.9	+10.2
Durable goods	—31.8	—21.0	—41.9	+17.4
Semi-durable goods	+1.2	—1.8	—28.2	+40.7
Perishable goods	—4.1	—1.3	—22.9	+24.4
All industries	—12.6	—8.2	—31.3	+27.2

[1] The changes from 1929 to 1935 in the estimated number of man hours given in Table 12, for the industries in the sample, may be compared with the estimated changes in all manufacturing industries, which are given below:

Goods for human consumption	—27.8
Capital equipment goods, excl. construction materials	—49.2
Construction materials	—49.7
Durable goods	—45.5
Semi-durable goods	—26.1
Perishable goods	—26.5

In general, the employment losses in the industries included in the sample were smaller than those in corresponding groups among all manufacturing industries. The excluded industries, among which are those making less standardized products not readily enumerated in physical units, suffered more severe declines. The greatest deficiency in the sample probably lies in the inadequate coverage of industries producing highly fabricated specialized articles of capital equipment. The productivity measurement for capital goods, as given in Table 12, probably overstates the actual gain. The same error may be present, in less degree, in the measurement relating to durable goods.

during change in the labor requirements of manufacturing industries. In Table 13 we take account of this factor, comparing with the actual employment figures for 1929 estimates of the number of workers and man hours required in 1935 to produce the volume of goods manufactured in 1929 and in 1935.

For all manufacturing industries the 1929 output, which required some 427 million man hours of effort in 1929, could have been produced in 1935 by approximately 336 million man hours.[18] The estimated decline of 91 million man hours represents potential displacement, the labor loss that would have occurred had the 1929 volume of output prevailed in 1935, with the 1935 level of industrial efficiency. The 1935 volume of output, which actually required 274 million man hours of labor per week, would have required 349 million man hours per week had the level of industrial efficiency been equal to that of 1929. The loss of some 75 million man hours of employment is the (arithmetic) equivalent of the advance in productivity between 1929 and 1935.

The measurements in column (4) for the several industrial groups indicate the magnitude of the potential employment losses by important classes of industry as a result of the productivity advances between 1929 and 1935. Production at the 1929 level of output is assumed. The entries for the first three industrial categories indicate that industries producing goods for human consumption would have contributed most heavily to the total employment loss, under the conditions assumed. This group accounted for a large part of total employment in 1929, and its productivity advance between 1929 and 1935 was sharp. The contributions of the capital goods and construction groups were relatively much smaller. The measurements for the second set of industrial groups indicate that the contributions to unemployment would have been greatest among industries producing semi-durable goods. A notable advance in productivity occurred in these industries from 1929 to 1935.

The figures in column (5) of Table 13 define, similarly, the changes between 1929 and 1935 in the number of man hours of work per week required to produce the 1935 volume of manufacturing production. These measurements are of considerable interest, for they enable us to estimate, for each industrial group, the relative importance of changes in productivity as a factor contributing to the shifts in volume of employment between 1929 and 1935. Among goods for human consumption, for which output in 1935 was only some 4 per cent below the 1929 level, the decline from 1929 to 1935 in the amount of labor required to produce the 1935 physical output amounted to about 56 million man hours per week.

In a complex situation, affected by many circumstances, we are not justified in attributing a causal role solely to one factor, such as a change in productivity. However, it is illuminating to express, as a percentage of the actual employment loss in each category, the change in aggregate employment that is apparently attributable to productivity changes. These percentages are given in column (6) of Table 13. For industries producing human consumption goods the loss that may be attributed to advancing productivity constituted some 87 per cent of the total employment loss. (In 1935 production in these industries amounted to about 96 per cent of the 1929 volume.) The correspond-

[18] The reader should note the assumption that output per man hour at the higher level of output (i.e., a level equal to that of 1929) would have been the same as that actually prevailing in 1935.

Table 13

Aggregate Man Hours Worked per Week in American Manufacturing Industries, 1929; with Changes from 1929 to 1935 in Total Labor Required to Produce Stated Quantities of Goods

Major Groups of Manufacturing Industries

(estimates based upon study of a sample of Census industries)

INDUSTRIAL GROUP	AGGREGATE MAN HOURS, 1929	ACTUAL DECLINE, 1929-35, IN AGGREGATE MAN HOURS	CHANGE, 1929-35, IN NO. OF MAN HOURS REQUIRED TO PRODUCE 1929 VOLUME OF OUTPUT[1]	CHANGE, 1929-35, IN NO. OF MAN HOURS REQUIRED TO PRODUCE 1935 VOLUME OF OUTPUT[1]	COL. (5) AS PERCENTAGE OF COL. (3)
		(in thousands)			
(1)	(2)	(3)	(4)	(5)	(6)
Goods for human consumption	232,260	—64,522	—58,282	—56,192	87.1
Capital equipment, excl. construction materials	105,108	—51,717	—13,230	—7,688	14.9
Construction materials	49,927	—24,817	—5,621	—2,561	10.3
Durable goods	212,186	—96,457	—31,348	—20,137	20.9
Semi-durable goods	114,069	—29,781	—33,112	—34,474	115.8
Perishable goods	99,873	—26,454	—19,589	—17,914	67.7
Total	426,924	—152,425	—91,292[2]	—74,664[2]	49.0

[1] The variable factor responsible for the changes noted is output per man hour.

[2] Because of the omission of data for certain industries, the total is not equal to the sum of the items above it.

ing percentages for industries producing capital equipment and construction materials were 15 and 10. Productivity changes could have accounted for only a small proportion of the employment losses in the latter two groups. The failure of production to regain 1929 levels was a far more important factor in both cases.

Similarly, the consequences of productivity changes were a minor factor (some 21 per cent of the total) in the employment losses among industries producing durable goods; for perishable goods it was more important (68 per cent); the 1935 output of semi-durable goods (e.g., knit goods, woolen and worsted goods, leather products) actually exceeded that of 1929, so the reduction in employment attributable to productivity gains actually exceeded the total decline.

IV

SUMMARY

Of the actual employment decline, in man hours, in manufacturing industries between 1929 and 1935, slightly less than half appears to be attributable to changes in industrial productivity; the remainder is apparently attributable to the decline in production. Reduced activity was a major factor in the employment losses in industries producing durable goods, mainly capital equipment and construction materials. The influence of enhanced productivity was relatively more important among industries producing perishable and semi-durable goods, in which output had been better maintained.

The persistence of reduced industrial activity, and the complex market conditions that underlie this reduction are, in a causal sense, more important than increased man hour productivity, as factors in the employment decline since 1929. Yet, it is of no small significance that in 1935 only 336 million man hours would have been required to produce a volume of goods requiring 427 million man hours in 1929. In eight years there was a net reduction of some 91 million man hours of labor in the aggregate effort required to maintain the 1929 volume of output. This reduction represented a great enhancement of man's power to wring from the earth the means of existence and the material bases of comfort.

This gain may be realized in various ways. More goods, which mean a higher standard of living, represent one possible product of this advance. The records indicate that if the gain were to be utilized in this form, the aggregate volume of goods available annually for consumption and for use in further production might have been increased, by 1935, by an amount approaching 20 or 25 per cent,[14] with a working force equal to that of 1929. This represents a substantial potential gain in the national standard of living.

An alternative mode of utilizing the gain involves a reduction in working hours, with increased leisure. The 8,839,000 workers in manufacturing industries in 1929 could, in 1935, have produced the 1929 output with a work week 10.3 hours shorter than in 1929. The 1929 work week averaged 48.3 hours; the reduction justified by advancing productivity, if all the gain were to be realized in the form of leisure, would have meant a work week of 38.0 hours. The actual work week in 1935 averaged 37.2 hours. The program of shorter hours represented, in effect, the allocation to leisure, or enforced idleness, of all the gains of advancing productivity, plus something more.

The most recent year for which comprehensive records of manufacturing operations are available is 1935. Statistics for selected establishments indicate a substantial increase in production and employment between 1935 and 1937, with a subsequent drop that carried manufacturing activity in the first half of 1938 well below the level of 1935. Accordingly, the description of the situation in 1935, somewhat darkened, may be taken to apply to that existing in the early summer of 1938. The work week was some two hours shorter than in 1935, output was 12 to 15 per cent lower, and employment (measured in man hours) was about 10 per cent less. Population had grown, as it had during the entire period of the depression, and the difficulty of finding employment was, by so much, accentuated. Reduced activity, therefore, aggravated by the steady pressure of new entrants to the labor market, rendered the 1938 problem of adaptation to the conditions of production and employment in manufacturing industries somewhat more serious than that of 1935.

Certain aspects only of this problem have been here presented. Price and wage policies are phases of it. Its long term solution entails a choice between a larger physical output and shorter working hours. Something of a re-direction of productive resources, particularly the annual additions to the working population, may be necessitated by the cumulative technical improvements that have been steadily increasing industrial productivity. This re-direction, which may mean the reversal of a movement into manufacturing and mechanical occupations that has grown steadily during the whole course of our national history, is perhaps at the heart of the problem. It involves issues transcending manufacturing industries alone.

[14] The figure in Table 8 is 27.2. This is a maximum. The actual gain in productivity undoubtedly fell short of this figure, which is based upon computations relating, in the main, to direct labor. When technical changes lead to the displacement of direct labor, they usually involve additional indirect labor in the capital goods and service industries. There may be cases, too, of direct transference of distributive and other functions from manufacturing to non-manufacturing enterprises.

Harry Jerome, 1886-1938

With deep regret the National Bureau announces the death of Professor Harry Jerome of the University of Wisconsin, one of its Directors by University Appointment.

Dr. Jerome's first connection with the National Bureau was as a member of its research staff which he joined in 1923. Out of his work with us grew, first, his book called *Migration and Business Cycles;* second, a series of field studies intended to determine more accurately than had been done how changes in machinery or industrial processes affect the demand for labor; third, *Mechanization in Industry,* which gives the results of this field work; and finally participation in the National Research Project upon mechanization, productivity of labor, and labor displacement in selected manufacturing industries.

To all members of the staff and to his fellow Directors Dr. Jerome endeared himself by his considerate ways, his readiness to cooperate, his wisdom as an adviser, and his deft humor.

Commodity Flow and Capital Formation

(500 pp., 77 tables, 8¼ x 11¾, $5)

This report by Simon Kuznets was distributed to subscribers in June. It stems from a five-year investigation of available data relating to the production and distribution of durable and non-durable commodities. Some results were summarized in *National Income and Capital Formation, 1919-1935.* Covering the period, 1919-35, Volume I of *Commodity Flow and Capital Formation* contains not only final summary estimates but also a wealth of details of interest to business men, marketing experts, and professional economists. For the first time, the nation's commodity output and its flow through the various distributive channels have been exhaustively analyzed. Complete basic data on the production of manufactured commodities, on changes in business inventories, on the volume of construction, and on the movement of distributive margins are included, together with critical comments about their derivation and their reliability.

Reviews of National Bureau Publications

National Income and Capital Formation, 1919-1935, by Simon Kuznets (8¼ by 11¾, 86 pp., $1.50)

The Nation, March 26, 1938:

"In this valuable piece of research Mr. Kuznets defines the product of the nation's economic activity, estimates its volume in the years since the war, indicates the contributions to it of the different parts of the economic system, shows how its monetary equivalent was distributed and how it was utilized. Of especial importance among the facts he has brought to light are those relating to capital formation —that is, the net addition to our stock of capital goods. This, he shows, formed on the average a relatively small share of the net product but one that fluctuated violently over the period. Those who see in the uneven flow of capital a main source of dislocation in the economic system and argue for the necessity of long-term planning will find here useful statistical support. The book calls attention to another kindred cause of instability by making a distinction between gross national product and net national income. The difference between these totals represents the extent to which durable capital goods are used up, or, in accounting terms, depreciation and depletion. Over the period 1919-35 the annual volume of this capital consumption averaged some nine billion dollars, or roughly one-eighth of the gross product. The degree to which financial provision for such depreciation was not translated into physical provision is worth further investigation by diagnosticians of the erratic tempo of our economic machine."

Journal of the Royal Statistical Society, Vol. CI, Part III, 1938:

"It is impossible to withhold the most whole-hearted admiration from this book, which must rank as one of the foremost empirical works of our time. It is a short book which has been based on a staggering number of investigations, computations and estimates. Yet one can only marvel at the dexterity and economy of the arrangement, and the lucidity of the presentation. In the text itself the general economist will find that account of national product which will be most useful to him, arranged in such a way that the results are clear and can be easily applied to broad economic investigations. The detailed figures and certain information for special application by students are compactly presented in the appendices."

Studies in Income and Wealth, by the Conference on Research in National Income and Wealth, Volume I (348 pp., $2.50)

American Economic Review, June 1938:

"The Conference on Research in National Income and Wealth comprises representatives of seven universities, nine research divisions of the federal government, and various other organizations. Its purpose has been to bring about an exchange of information among the workers in its field, to promote agreement upon the most appropriate concepts and terminologies to be used, and to stimulate research on a cooperative basis. This volume presents the results of the Conference's attempt to clarify concepts, unify terminology, and improve procedure; the statistical estimates it contains are presented mainly for the purpose of illustration, and there is little discussion of available statistical sources. As such it is not a book for the use of the average student of economics, but will be required reading for all those interested in the field which it covers."

The papers that will comprise Volume II are to be sent to the printer by the end of the month. The price of Volume II will be $3. The two volumes will be sold together for $5.

Bond Yields, Interest Rates, and Stock Prices, by Frederick R. Macaulay (586 pp., 32 charts, of which 6 are enlarged and tipped in on rag paper; 33 tables, $5)

The Times, London, Literary Supplement, July 23, 1938:

"The original object of Dr. Macaulay's studies was a review of 'the course of interest rates and bond yields in the United States over a long period with a view to ascertaining what statistical relation these rates and yields bear to one another, to the prices of stocks and commodities, to the physical and monetary volume of trade, and to credit and banking activities'. This object has been achieved with complete success, and the tables and charts in which this valuable book abounds will prove a source of almost endless pleasure for statisticians and students of economic history in general and of the trade cycle in particular. Dr. Macaulay has, however, done much more than collect and arrange a vast mass of statistics.

In striving to interpret the movements which his figures illustrate and measure he has contributed something new and valuable to the theory of the trade cycle, which is explained as a failure on the part of society to foresee and adapt itself to the future. The science of forecasting business conditions, though full of difficulty, is not utterly sterile, but mankind should aim at moulding the future rather than at attempting merely to forecast it. 'The hope of the world', Dr. Macaulay declares, 'lies in truly social, as opposed to merely individualistic, economic planning.' Dr. Wesley C. Mitchell, to whom the book is dedicated, supplies a preface praising Dr. Macaulay's impressive achievement with which no intelligent reader will fail to agree."

Journal of the Royal Statistical Society, Vol. CI, Part III, 1938:

"This immense volume is number 33 of the publications of the National Bureau, and unmistakably lives up to the high reputation of that series for research into facts. Its size is largely accounted for by the wealth of statistical data which Dr. Macaulay has accumulated. The text, which is liberally illustrated by excellent charts, only covers some 235 pages, though to this may be added another 45 pages of appendices not devoted to figures.

After an interesting introduction largely dealing with the scientific method in economics, the author plunges into a detailed discussion of the concept of long-term interest rates. This is useful because it is a subject that tends to be neglected by economists, who, in the nature of things, do not come very closely into touch with the problems of bond valuation. In this chapter Dr. Macaulay makes clear what he means by the yield of a bond, and develops the concepts of the 'duration' of a bond and the 'implicit' rates of interest related to the issue price of a new bond of a given nominal rate. . . . .

. . . It is an empirical work of the first importance in a field remarkable for inattention to details of fact. In clarity it rivals Dr. Macaulay's earlier technical handbook on the smoothing of time series, and the appendices contain information of the greatest importance to students of the general fluctuations in trade."

Readers are reminded of the announcement in the May 28 *Bulletin* that the first chapter of Dr. Macaulay's volume, together with Dr. Mitchell's Preface, have been reprinted in a booklet (35 cents). Dr. Macaulay is now conducting the investigation into short selling being made by the Twentieth Century Fund at the request of the New York Stock Exchange.

National Bureau of Economic Research

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Bulletin 76-7 1819 BROADWAY, NEW YORK *October 15, 1939*

Copyright, 1939, National Bureau of Economic Research, Inc.

THE STATISTICAL PATTERN OF INSTALMENT DEBT

R. A. YOUNG *and* BLANCHE BERNSTEIN

This Bulletin presents findings developed from a study of the use of instalment credit for the purchase of commodities. The study was initiated in 1938 as one phase of the National Bureau's investigation of consumer instalment financing, the first project under the program of research in finance supported by special grants from the Association of Reserve City Bankers and the Rockefeller Foundation. Other results of the study will be published later in 1939.

The preparation of the study was directed by Ralph A. Young, and the estimates of the use of instalment credit were made by Blanche Bernstein. Dr. Young and Miss Bernstein collaborated in writing the text.

The authors wish to acknowledge the statistical assistance of Pauline Arkus, Peter Franck, and Esther Skala. For criticism of our first draft we are indebted to Moses Abramovitz, B. H. Beckhart, Milton Friedman, Gottfried Haberler, Simon Kuznets, F. C. Mills, W. W. Riefler, and Leo Wolman. Mr. Friedman also advised us frequently at various stages of our work. The text and tables have greatly benefited from the careful editing of Isabel Davis and Elizabeth Todd.

This Bulletin is based on data obtained from the Study of Consumer Purchases, a Works Progress Administration project conducted by the United States Bureau of Home Economics and Bureau of Labor Statistics in cooperation with the National Resources Committee and the Central Statistical Board. We are under special obligation to the Bureau of Labor Statistics and the Bureau of Home Economics for making available to us the original tabulations of instalment-debt items from the Study of Consumer Purchases; and to the National Resources Committee for the use of unpublished material on consumer incomes. In particular, we wish to express our appreciation to Faith Williams of the Bureau of Labor Statistics, to Day Monroe and Dorothy Brady of the Bureau of Home Economics, and to Hildegarde Kneeland of the National Resources Committee, for the suggestions and technical help they gave us during the preparation of our estimates.

1 AIM AND SCOPE

Over the last twenty years the practice of financing consumer purchases by instalment or deferred payment credit has acquired increasing importance in the marketing of commodities. Although it is known that the use of instalment credit has spread through many income levels, no comprehensive statistical information on its use by various consumer groups has been available.

This Bulletin presents such information for the year 1935-36, describing the statistical pattern of instalment debt for the country as a whole, and thus delineating the broad outlines of the market for instalment credit. It contains estimates of the percentage of families in different income groups having a net change in instalment debt, 1935-36, first for all commodities combined and then separately for six groups of commodities: automobiles, furniture, electric refrigerators, radios, 'other electric equipment', and miscellaneous commodities.[1] We have also estimated which income groups were increasing and which were decreasing instalment obligations and the amount of average increase or average decrease. The year 1935-36, to which our figures apply, was one of sharp business expansion, and these estimates therefore reflect the instalment-debt behavior of consumers during the expansion phase of one business cycle. In addition, we have undertaken to indicate how instalment buying habits vary in different types of communities and different regions. Our estimates of the pattern of instalment debt for all non-relief families in the United States during 1935-36 are based on a sample of 60,000 family expenditure schedules.

[1] A further study in preparation by the National Bureau will contain additional data showing the percentage of families having a net change in instalment debt in various occupational and family-size groups. Estimates are also being made of the markets for charge account and cash loan credit, so that variations in the use of instalment credit, charge account credit, and cash loans may be compared.

2 SOURCE AND LIMITATIONS OF DATA

The Study of Consumer Purchases,[2] the source of our basic data, was a project of the Works Progress Administration. It

[2] The Study of Consumer Purchases is more completely described in *Consumer Incomes in the United States* (National Resources Committee, 1938), pp. 45-52, and in releases by the Bureau of Labor Statistics and the Bureau of Home Economics, presenting preliminary tabulations of the data. The tabulations of instalment debt in metropolises and large and middle-size cities, and in small cities in the East Central and New England regions, have been published in U. S. Bureau of Labor Statistics Bulletin 648, Vol. VIII, *Changes in Assets*

consisted of an extensive field investigation conducted during 1936 in various communities throughout the United States. Data were collected in 51 cities, 140 villages, and 66 farm counties in 30 states, chosen to represent different geographic regions, degrees of urbanization, and types of farming areas. Information on family expenditures and changes in family debt during the preceding year[3] was obtained from some 60,000 families, all non-relief and mostly native white.[4]

One important qualification regarding the basic data should be borne in mind. On the original schedules the information obtained from each family referred only to *net change* in instalment debt during the year, not to the existence of instalment debt or to the total amount of such debt incurred. 'Net change' means simply the net increase or the net decrease in the balance due on instalment purchases. For example, a family owing $100 on an automobile instalment debt at the beginning of the year, and retiring this debt completely during the year, would have reported a net decrease in debt of $100. If the same family bought another car during the year, and had an unpaid balance of $300 on this purchase at the end of the year, a net increase in debt of $200 would have been reported. Figures on the total amount of instalment debt would have been easier to understand and somewhat more informative, but for many purposes net change in debt is equally significant.

As a result of this method of reporting indebtedness, families owing exactly as much at the end of the year as at the beginning were not included among families having a net change in debt, nor were families that had incurred instalment debt during the year and paid it off completely by the year-end;[5] but families were included whose indebtedness at the beginning of the year was entirely liquidated by the end.

To avoid continual use of the expression 'families having a net change in debt' we have adopted the term 'families indebted' as a synonym, using it to refer to families indebted during the year and not merely at the year-end, as it might seem to imply. Data showing the number of families having a net change in debt necessarily overestimate the number of families indebted at the end of the year. The number of families increasing debt would be the minimum number that could be so described. The category of families decreasing debt includes both those still indebted at the end of the period and those who have completely liquidated instalment obligations. It is impossible from available data to estimate the importance of the latter group and thus indicate the degree to which the number of families indebted at the end of the year has been overestimated.

We shall also employ the terms 'frequency of debt' and 'extent of use of instalment credit', using them as synonyms for the percentage of families having a net change in debt or the percentage of families indebted during the year. As we use the phrase, 'extent of use of instalment credit', it pertains to the percentage of families making payments on instalment purchases, whether bought in the given year or earlier—in other words, to the percentage of families having a net change in debt.[6] Thus, it does not mean the percentage of families making instalment purchases during the year. The latter interpretation of the term is best approximated in our data by the percentage of families increasing debt. This percentage, however, would only roughly indicate that of families making purchases during the year; some families decreasing debt may also have made new instalment purchases, their effect being counterbalanced by repayments on old purchases.

Another limitation of the data arises from the fact that the original expenditure schedules were obtained only from *non-relief* native white (and Negro) families. Single individuals were excluded,[7] as were relief and foreign-born families, so that there are no data to indicate whether or not the debt pattern of these groups resembles that of the families included. Finally, in each type of community data are lacking for certain income classes—the very high income groups in some, the very low in others.

The Appendix to this Bulletin discusses these limitations in the coverage of the data and assesses their bearing on our final results. It also outlines the methods by which national estimates were built up from the sample covering 60,000 families.

3 Summary of Findings

a) Our estimates show that almost one-quarter of all non-relief families in the United States had a net change in instalment debt during 1935-36, and that the use of instalment credit, as indicated by these data, varied with income level. The proportion of families in each income class indebted for instalment purchases rose steadily from approximately 10 per cent in the group receiving less than $250 a year to 32 per cent in the $1750-2000 band, and then declined consistently.

b) A sharp increase in instalment buying occurred during

and Liabilities in Selected Cities. The instalment debt data for small cities in other regions and in villages and farms, which were tabulated by the Bureau of Home Economics, have not yet been published.

[3]The majority of the schedules covered the year ending approximately June 30, 1936, but some applied to the calendar year 1935, and others covered the year immediately preceding the date of interview (in other words, a 12-month period ending before or after June 30, 1936). In no case, however, did the schedule year end before December 1935, or after December 1936.

[4]In the South, and in New York City and large cities in the North Central region, expenditure schedules were obtained also from Negro non-relief families.

[5]This means that our estimates do not cover instalment debt of relatively short duration, contracted and liquidated between the terminal points of the schedule year. Short-term instalment obligations in existence either at the beginning or at the end of the year are included, however, since they do reflect a net change in debt.

[6]Families having a net change in debt and families making instalment payments during the year are not actually identical, since families owing as much at the end as at the beginning of the year and families incurring and paying off obligations within the year would not be included among the former. It is not believed, however, that the difference is very large.

[7]Except in two cities, Chicago and Portland (Oregon), but these data have not been incorporated in our estimates.

the expansion period 1935-36. More than 70 per cent of the families having a net change in instalment debt increased their instalment obligations. At all income levels more families were increasing than were decreasing their obligations, but the increases were relatively more frequent among lower than among higher income families.

c) Both the average debt-increase of families increasing debt and the average debt-decrease of families decreasing debt (for all types of commodities combined) rose steadily as income advanced, indicating that the use of instalment credit is usually associated with purchases that in price and quantity are related to size of family income. But both average increase and average decrease in debt formed a diminishing proportion of total family income as income increased from the lowest to the highest levels. Average increase declined from 61 per cent of income in the lowest income band (under $250) to 4 per cent in the highest band ($5000 and over).

d) The net increase (sum of all increases minus sum of all decreases)[8] in instalment debt attributable to non-relief families totaled over $407,000,000. Families having incomes between $1000 and $2000 were responsible for almost half of this net increase in debt, though only 40 per cent of non-relief families are in this income band.

e) Income classes below $1500 included a smaller share of the gross increase (sum of all increases) in debt than of the number of families increasing debt, and a smaller share of the gross decrease (sum of all decreases) than of the number of families decreasing debt, indicating a smaller average size of debt. Families above the $1500 level, on the other hand, exhibited the reverse tendency, holding a more than proportionate share of the gross increase and decrease in instalment debt. A disproportion, though not so marked, existed also between the distribution of families indebted for instalment purchases and the distribution of the net increase in debt.

f) Almost one-third of the instalment-debt changes of families living in metropolises and large and middle-size cities applied to purchases of furniture, one-fifth to automobiles, one-third to electric refrigerators and 'other electric equipment', and one-twelfth to radios.[9] Less than one-tenth of the debt changes related to the 'miscellaneous commodity' category, which includes non-durable or 'soft' consumers' goods; this suggests that the instalment credit device had not made extensive inroads into the soft goods market by 1935-36. Soft goods, however, are often sold on very short contracts with payments scheduled weekly, so that purchases made and paid off during the year would have escaped reporting under the method employed in obtaining the original sample data. Therefore the 'miscellaneous commodity' category underestimates the number of soft goods instalment transactions during this period.

g) Many families, of course, carried instalment debt on more than one commodity. Our data show that as income rose to the level of $3000, there was an increasing tendency for families to owe for more than one commodity, but above this level the tendency was reversed.

h) Automobile purchases, the greatest source of dollar volume of instalment debt, were responsible for over 50 per cent of the gross increase in instalment debt during the year 1935-36, and for almost 60 per cent of the net increase. Furniture purchases represented the second largest source of gross increase, and the largest source of gross decrease in debt, so that in this year they formed a relatively insignificant element in the net increase in instalment debt.

i) The use to which instalment credit was put varied in different income groups. In the lower income levels (under $1000) furniture was the commodity most frequently financed on instalment terms, with radios, 'other electric equipment', and miscellaneous articles next in importance. Families with incomes between $1000 and $2000 were making instalment payments on furniture, automobiles, electric refrigerators, and 'other electric equipment' more frequently than on the other types of commodities; and above the $2000 income level instalment debt was most often related to automobiles.

j) For every type of commodity financed on instalment terms, more families in each income group were increasing than were decreasing debts, and increases were in every case relatively more numerous among lower income families (under $2000) than among higher income families. The ratio of families increasing to those decreasing instalment obligations was smaller, however, for furniture and electric refrigerators than for other commodities. This may have resulted from the fact that furniture and electric refrigerators are usually sold on longer terms.

k) For all commodities except furniture the average debt-increase was generally higher than the average debt-decrease. That average debt-increase is higher is due in part to differences in the average duration and age of instalment contracts as between families increasing and those decreasing debt; it suggests also that possibly unit instalment purchases were larger, on the whole, during 1935-36 than in the preceding year, and that unit furniture purchases, on the other hand, were smaller during 1935-36 than in 1934-35. For each commodity group both average debt-increase and average debt-decrease were directly related to income; that is, they rose as income advanced. This supports the contention that the use of instalment credit is usually associated with purchases of commodities at prices or in quantities compatible with size of family income.

l) The proportion of gross increase and gross decrease in debt originating with families having incomes under $1000 and over $3000 varied widely for the different commodities. For all commodities except automobiles, however, approximately half of the gross increase and gross decrease in debt came from families having annual incomes between $1000 and $2000. Most of

[8] Gross increase means the sum of increases in debt of families having a net increase. Gross decrease is the sum of decreases in debt of families having a net decrease. Net increase equals gross increase minus gross decrease.

[9] It is probable that if smaller types of communities had been included these proportions would differ to some extent, with automobiles forming a slightly larger, and furniture and electric refrigerators a smaller, proportion of the total debt changes.

the net increase in instalment outstandings (for all commodities except automobiles) originated with families whose annual incomes were under $2000.

m) The use of instalment credit is definitely an urban phenomenon; data covering the North Central region indicate that approximately 70 per cent of families indebted for instalment purchases were urban dwellers. In all income classes the frequency of instalment debt was highest in large, small, and medium-size cities in this region, in the order mentioned; villages ranked fourth and metropolitan centers fifth. Among farm families the frequency of debt was very much lower than in any other type of community, probably because of the irregular flow of farm income. Urban families were most often indebted for furniture and next most frequently for automobiles, while among village and farm families automobiles were foremost. Over 50 per cent of the families indebted for all commodities, except automobiles (43 per cent) and the miscellaneous group (32 per cent), were residents of large or small cities, although only one-third of the population lived in these communities. In contrast, metropolitan and farm families in general constituted a smaller proportion of the families indebted for instalment purchases than of the population.

n) The use of instalment credit varied also among regions. One-third of all families in the Pacific region were indebted for instalment purchases, one-fifth of the families in the North Central region, and one-fourth in the other regions. The Pacific region, however, had the highest frequency of debt only in the income levels below $2000. Above this level families in the South used instalment credit to a greater extent than Pacific families. Debt for furniture, refrigerators, and radios was most prevalent in the South, but the greatest debt frequency for automobiles and miscellaneous goods occurred in the Mountain-and-Plain region, and for 'other electric equipment' in the Pacific region.

These regional differences in instalment buying behavior only partly reflect cultural and social variations. Since instalment buying is primarily an urban phenomenon, the type of city that predominates in a given region, and the distribution of urban family incomes in the region, must also be considered important factors causing regional variation.

TABLE I

Percentage of Non-Relief Families having a Net Change in Instalment Debt, and their Percentage Distribution, 1935-1936, by Income Level

ANNUAL INCOME	PERCENTAGE OF FAMILIES	PERCENTAGE DISTRIBUTION	
		Families having a net change in instalment debt	All non-relief families[1]
Under $250	10.4	1.2	2.8
250— 500	12.3	4.1	7.8
500— 750	16.8	8.1	11.3
750—1000	21.3	12.1	13.4
1000—1250	24.9	13.9	13.2
1250—1500	27.6	12.6	10.8
1500—1750	29.0	11.1	9.1
1750—2000	31.9	9.9	7.3
2000—2500	30.2	12.2	9.5
2500—3000	29.3	6.5	5.2
3000—4000	23.8	4.8	4.8
4000—5000	21.5	1.5	1.6
5000 and over	15.0	2.0	3.2
Total	23.6	100.0	100.0
Estimated number of families (in millions)		5.8	24.9

[1]Adapted from *Consumer Incomes in the United States*, Table 8, p. 25.

4 USE OF INSTALMENT CREDIT BY DIFFERENT INCOME GROUPS

Table 1, based on data from all types of communities, shows that almost one-quarter of the non-relief families in the United States were indebted for instalment purchases during 1935-36, and indicates that instalment credit was used by all but the very wealthy. The extent of its use, however, varied considerably at different income levels, as is illustrated in Chart I.

Less than 13 per cent of families in the very low annual income levels (under $500) were indebted for instalment purchases, and roughly 20 per cent of those between $500 and $1000.[10] The percentages continue to rise steadily to a peak of 32 per cent at the $1750-2000 income level, and then decline consistently; only 15 per cent of families with incomes of $5000 or over had a change in instalment debt. At all income levels between $1000 and $4000, however, approximately one out of every four families was indebted for instalment purchases.

Table 1 indicates further that over 90 per cent of families indebted for instalment purchases had incomes of less than $3000 a year. A comparison of the distribution of all non-relief families and of families indebted for instalment purchases (Chart II) shows that in some income groups there was a considerably larger proportion of instalment debtors than of the total population. More than one-third of non-relief families in the country have incomes under $1000 a year, but barely one-quarter of the families carrying instalment debt were in these income classes. On the other hand, each income band between $1000 and $3000 included a larger proportion of families indebted for instalment purchases than of all non-relief families. Approximately 40 per cent of non-relief families had incomes between $1000 and $2000, but almost half of the families indebted for instalment purchases were in this income band; and the 15 per cent of families who had annual incomes of $2000 to $3000 comprised over 18 per cent of the instalment purchasers. Between $3000 and $5000 the number of families having debt was about proportionate to the number of families having incomes within these limits, but above $5000 a less than proportionate number of families had instalment debt.

Instalment buying rose markedly during 1935-36. Of an

[10]At each level incomes of exactly the higher amount are included in the succeeding level; that is, an income of exactly $1000 is included in the $1000-1250 income group. This practice is followed in all tables.

estimated total of 5.8 million non-relief families having a change in instalment debt 4.1 million, or about 70 per cent, had increased their obligations during the year; only 1.7 million decreased their debts (Table 2). Within the different income levels, of course, the proportion of families increasing debts varied (Chart III); it declined more or less steadily from 84 per cent in the lowest income band (under $250), to 62 per cent in the second highest income level ($4000-5000), and rose to 69 per cent for families with incomes of $5000 and over.

Thus at all income levels far more families were increasing than were decreasing their instalment indebtedness during this period of business advance, but the tendency was strongest among the lower income families. Chart IV reflects the fact that this tendency was particularly marked for families with incomes below $750, with the consequence that the band below $750 included proportionately more families that were increasing than families that were decreasing debts. It will be shown in Section 5 that there were noteworthy variations in the distribution patterns of families increasing and decreasing debts for some types of commodities.

Both average increase and average decrease in debt rose steadily as income mounted from the lowest to the highest levels (Table 3), reflecting the fact that instalment credit purchases, like cash purchases, tend to be related in price and quantity to the size of family income; in other words, that the use of instalment credit does not ordinarily change the fact that lower income families must purchase smaller quantities of goods, at lower prices, than higher income families.

The lower income groups, however, devoted a considerably larger percentage of income to instalment purchases than higher income families. The proportion of family income required for the average increase in instalment obligations declined con-

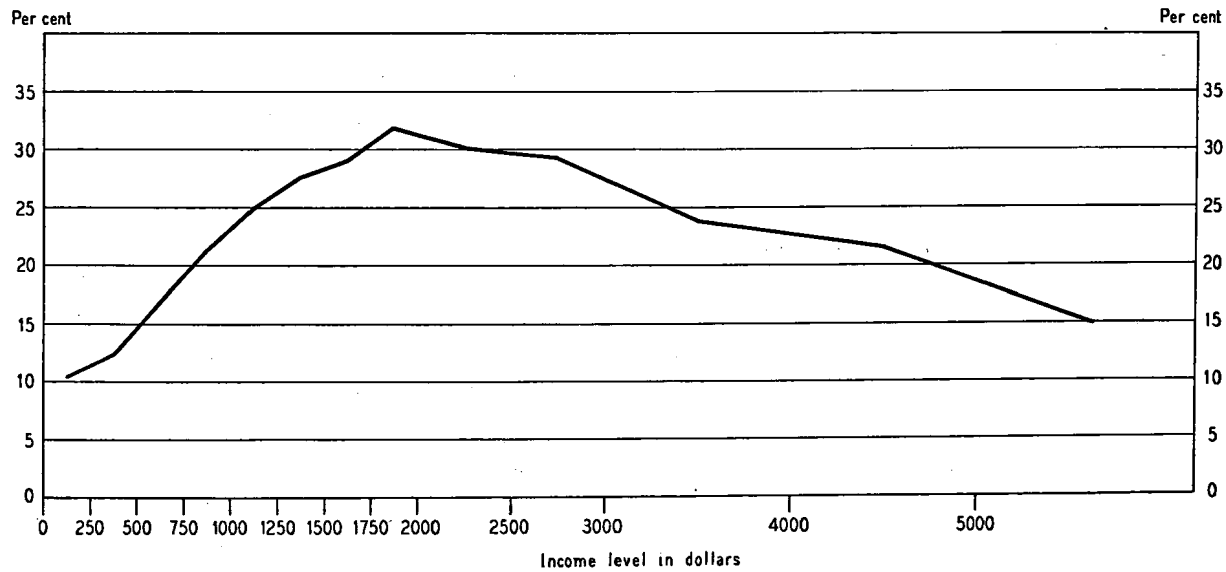
TABLE 2

Percentage of Non-Relief Families Increasing or Decreasing Instalment Debt, and their Percentage Distribution, 1935-1936, by Income Level

ANNUAL INCOME	PERCENTAGE OF FAMILIES		% DISTRIBUTION OF FAMILIES	
	Increasing debt	Decreasing debt	Increasing debt	Decreasing debt
Under $250	8.7	1.7	1.5	.7
250— 500	9.3	3.0	4.4	3.3
500— 750	12.4	4.4	8.5	7.1
750—1000	14.8	6.5	12.0	12.4
1000—1250	17.5	7.4	13.9	13.8
1250—1500	19.5	8.1	12.7	12.4
1500—1750	20.0	9.0	10.9	11.6
1750—2000	22.5	9.4	10.0	9.8
2000—2500	21.0	9.2	12.0	12.4
2500—3000	19.9	9.4	6.3	7.0
3000—4000	15.6	8.2	4.5	5.5
4000—5000	13.4	8.1	1.3	1.9
5000 and over	10.4	4.6	2.0	2.1
Total	16.6	7.0	100.0	100.0
Estimated number of families (in millions)			4.1	1.7

Chart I

PERCENTAGE OF NON-RELIEF FAMILIES HAVING A NET CHANGE IN INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL



sistently from 61 per cent in the income band under $250, and 19 per cent in the $250-500 level, to 4 per cent in the highest income group. Similarly, the proportion of family income represented by the average decrease in instalment debt declined from 30 per cent in the lowest income level and 10 per cent in the $250-500 class to under 5 per cent in the $5000 and over group.

Average increase in instalment debt was larger than average decrease in every income class except the $5000 and over group. As income rose, however, the ratio of average increase to average decrease declined from a peak of 2 in the lowest level to 1.3 in the $1250-2000 level, and 1.1 in the three levels between $2500 and $5000; above this level of income the ratio of average increase to average decrease was 0.8. This relationship results in part from the fact that the commodities most frequently purchased on instalment terms differ in different income levels. As will be seen in Section 5, furniture was the commodity most frequently purchased on instalment terms by families with incomes below $2000, and automobiles were the most frequently purchased commodity by families with incomes above this level. For families with incomes between $1000 and $1750 electric refrigerators and 'other electric equipment' were the next most frequent instalment purchase after furniture. The longer the typical duration of contract on the commodities purchased, the greater the bias toward a larger average increase than average decrease in debt, and the typical contracts for furniture and electric refrigerators are longer than those for automobiles. The general tendency for the ratio of average increase to average decrease to decline as income rises is apparent also when the data for average increase and decrease are analyzed by commodities (Table 11).

TABLE 3

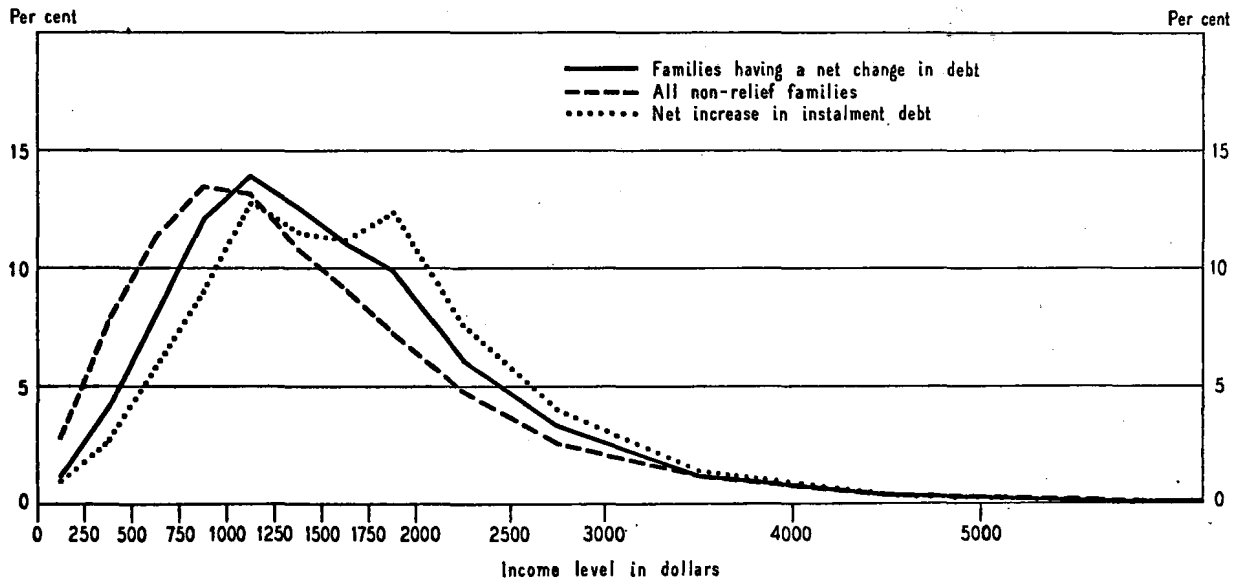
Average Increase and Decrease in Instalment Debt of Non-Relief Families Increasing or Decreasing Instalment Debt, 1935-1936, by Income Level

ANNUAL INCOME	AVERAGE INCREASE	RATIO OF AVERAGE INCREASE TO AVERAGE INCOME[1]	AVERAGE DECREASE	RATIO OF AVERAGE DECREASE TO AVERAGE INCOME[1]
Under $250	$71	60.7	$35	29.9
250— 500	72	18.6	39	10.1
500— 750	87	13.9	54	8.6
750—1000	100	11.4	60	6.9
1000—1250	124	—11.1	79	7.1
1250—1500	132	9.7	102	7.5
1500—1750	154	9.6	118	7.3
1750—2000	181	9.9	141	7.7
2000—2500	195	8.8	157	7.1
2500—3000	216	8.0	190	7.0
3000—4000	234	6.9	215	6.3
4000—5000	284	6.5	252	5.7
5000 and over	336	3.9	411	4.8
Total	151	9.3	122	7.5

[1]The average income in each class was derived from *Consumer Incomes in the United States*, Table 3, p. 18, by dividing the aggregate income received by the total number of families in each income class. The average income for the $5000 and over group represents the average for families having incomes between $5000 and $20,000.

Chart II

PERCENTAGE DISTRIBUTION OF NON-RELIEF FAMILIES HAVING A NET CHANGE IN INSTALMENT DEBT, OF ALL NON-RELIEF FAMILIES, AND OF NET INCREASE IN INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL



Here, however, the tendency is neither so consistent nor so pronounced as when all commodities are combined. It seems reasonable to suggest, therefore, that the declining ratio for all commodities reflects also a tendency for lower income families to increase the amount of their instalment debt proportionately more than did higher income families during this expansion period.

The total amount and distribution of the gross increase (sum of all increases), the gross decrease (sum of all decreases), and the net increase (gross increase minus gross decrease) are shown in Table 4. It must be remembered that these estimates relate only to non-relief families, and that therefore the total of over $407,000,000 of net increase in debt does not represent the entire increase in outstandings during this period.[11] Over two-fifths of the gross increase and gross decrease, and almost half of the net increase, in outstandings during this period were attributable to families having annual incomes from $1000 to $2000. Each income class below $2000 had a larger proportion of the gross increase than of the gross decrease in debt (except the $1500-1750 level, where the two were the same), and above $2000 each income class had a smaller proportion of the gross increase than of the gross decrease.

Comparison of the tables showing the distribution of fam-

[11] A rough estimate of the amount of instalment debt held by single individuals and relief families—computed by assuming that the debt pattern is the same for these groups as for non-relief families—indicates a total increase in outstandings of $580,700,000. This figure closely approximates an independent estimate of instalment outstandings to be presented by the National Bureau in a forthcoming Bulletin on quantitative measures in the field of consumer instalment financing.

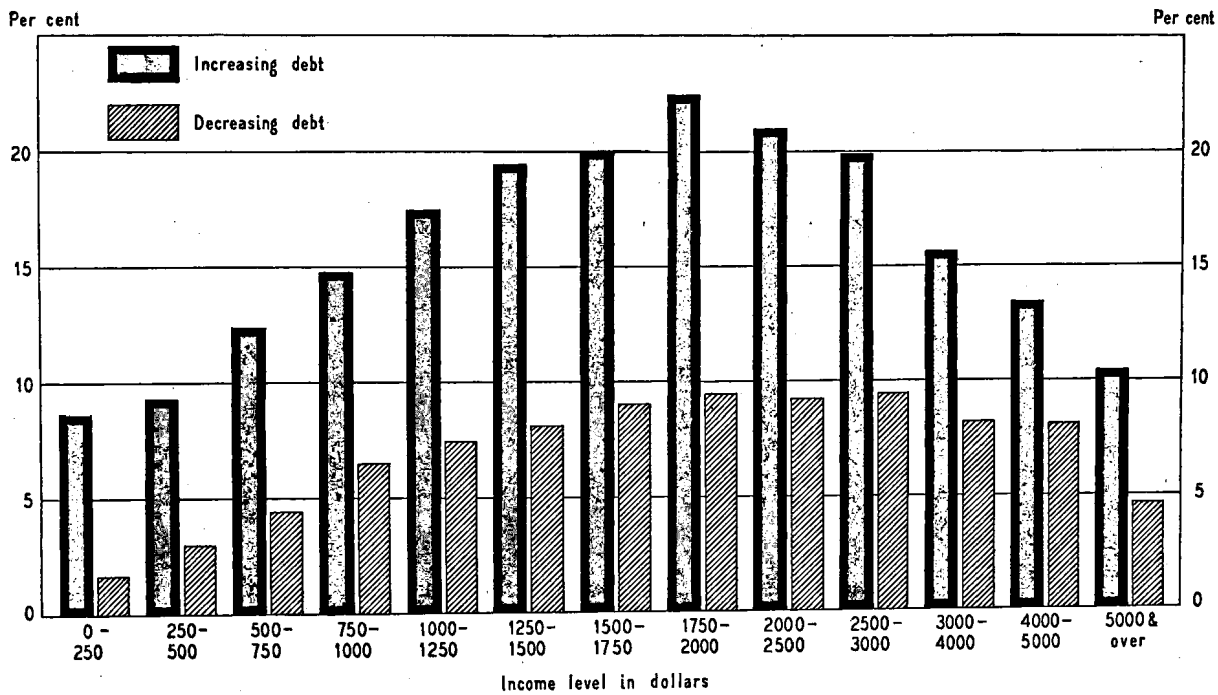
TABLE 4

Percentage Distribution of the Gross Increase, Gross Decrease, and Net Increase in Instalment Debt of Non-Relief Families, 1935-1936, by Income Level

ANNUAL INCOME	GROSS INCREASE	GROSS DECREASE	NET INCREASE
Under $250	.7	.2	1.0
250— 500	2.1	1.1	2.7
500— 750	4.9	3.1	5.8
750—1000	8.0	6.1	9.0
1000—1250	11.5	9.0	12.7
1250—1500	11.1	10.4	11.5
1500—1750	11.2	11.2	11.2
1750—2000	12.0	11.4	12.3
2000—2500	15.6	16.0	15.5
2500—3000	9.0	10.9	8.0
3000—4000	6.9	9.8	5.5
4000—5000	2.5	3.8	1.7
5000 and over	4.5	7.0	3.1
Total	100.0	100.0	100.0
Estimated change (in millions)	$620.9	$213.3	$407.6

Chart III

PERCENTAGE OF NON-RELIEF FAMILIES INCREASING OR DECREASING INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL



ilies increasing and decreasing instalment obligations with the distribution of the gross increase and decrease indicates that the lower income families held a less than proportionate share of the debt: over 26 per cent of families having an increase in debt had incomes of less than $1000, but these families accounted for less than 16 per cent of the gross increase in instalment debt; similarly, this lower income group included about 24 per cent of the families decreasing debts but less than 11 per cent of the gross decrease. The income classes above $1500, on the other hand, included a larger share of the gross increase and decrease than of the families increasing or decreasing. A similar, though not so marked, disproportion exists between the distribution of families having a net change and the distribution of the net increase in instalment debt. Of all families having a net change in instalment debt 52 per cent had incomes of less than $1500, and were responsible for about 43 per cent of the net increase in instalment outstandings.

5 The Pattern of Debt Changes by Types of Commodities

Instalment credit, first used mainly for the purchase of furniture, began to develop rapidly in the early 1920's as a means of facilitating the purchase of automobiles. It has since spread to many less durable commodities, being widely promoted today even in the purchase of 'soft' or perishable goods. Our estimates indicate that about 80 per cent of the number of 1935-36 instalment-debt changes relate to commodities other than automobiles.

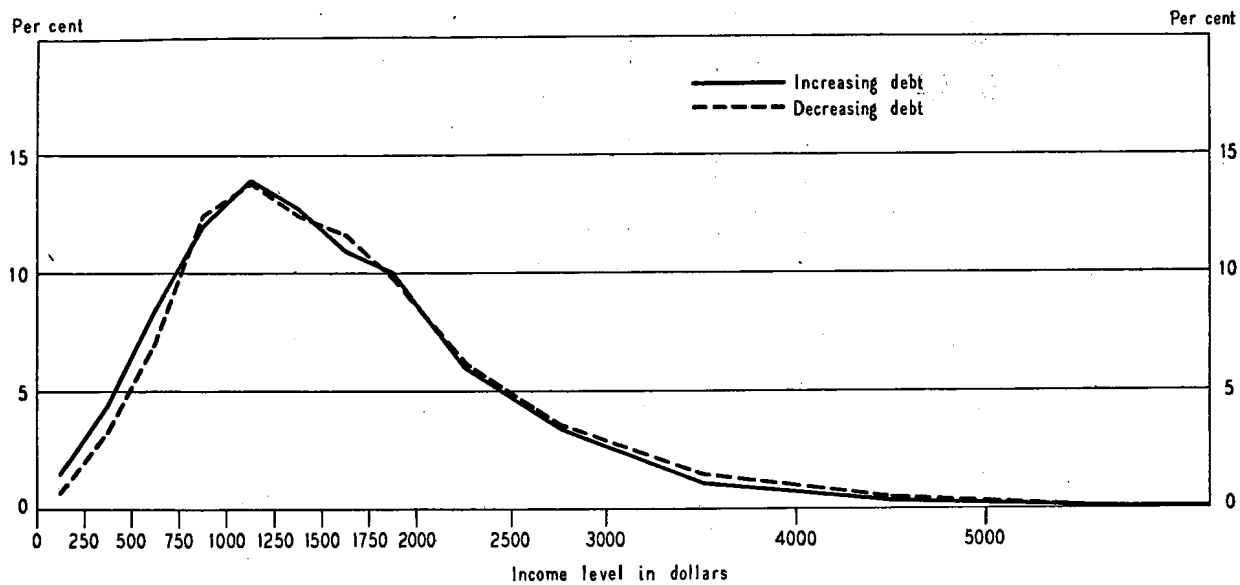
Furniture was the source of about one-third of the instalment-debt changes in 1935-36. Automobiles were second in importance, being the source of instalment debt in 20 per cent of the debt changes; approximately another one-third of the instalment-debt changes were divided almost equally between electric refrigerators and 'other electric equipment' (Table 5 and Chart V). These estimates are based on data obtained from families living in metropolises and large and middle-size cities. In view of the data to be presented in Section 7, which show distinct variations in the distributions of instalment-debt changes by kind of commodity in different types of communities in one region, it seems probable that had data from smaller communities been included in this table the proportions would differ to some extent. Automobiles would form a larger, and furniture and electric refrigerators a smaller, proportion of the total debt changes.

Less than 10 per cent of the debt changes were in the miscellaneous commodity category, which includes 'soft' goods purchased on instalment terms as well as other durable goods not included in the individual commodity groups. This suggests that instalment credit had not yet made extensive inroads into the 'soft' goods market by 1935-36. Instalment purchases of soft goods, however, are made on relatively short-term contracts with payments usually scheduled weekly, and since families who incurred and paid off obligations within the year are not included in these instalment-debt data, the miscellaneous category probably underestimates the number of instalment transactions of 'soft' goods in liquidation during this period.

Furniture and electric refrigerators had less than proportionate shares of the total number of debt-increases; almost 60 per cent of the reductions in instalment obligations related to these two items, compared with less than 42 per cent of the increases

Chart IV

PERCENTAGE DISTRIBUTION OF NON-RELIEF FAMILIES INCREASING OR DECREASING INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL



in debts. The other commodities had substantially smaller shares in the distribution of all debt-decreases than of all debt-increases.

The number of instalment-debt changes involving a given commodity is not an index of that commodity's significance as a source of the dollar volume of instalment debt. In volume automobiles were by far the most important single source of instalment debt (Table 6 and Chart VI), a fact accounted for by their higher unit prices compared with other commodities. About one-fifth of the number of instalment-debt changes during 1935-36 were for automobiles, but in dollar amount of instalment credit they were responsible for over 50 per cent of the gross increase and almost 60 per cent of the net increase.

Furniture represented a large percentage of the number of instalment-debt changes, but it was only a minor element of the net increase in dollar outstandings. This reflects the fact that although many more families were increasing than were decreasing furniture obligations,[12] in all income bands but two[13] the average debt-increase (of families increasing debts) was less than the average debt-decrease (of families decreasing debts),[14] and it would indicate that unit instalment purchases of furniture had been larger in the preceding year (1934-35) than in the one under consideration.

Table 7 indicates, by income groups, the frequency of instalment debt for different types of commodities. Furniture was more commonly financed by instalment payments than any other commodity, with automobiles second. Chart VII shows, however, that the instalment financing of furniture was relatively most frequent only in income bands below $2000; above this level the purchase of automobiles took first place. In income groups below $1000 families indebted for automobiles were fewer than those indebted for any other commodity;[15] but in the income group above $5000 they were four times as numerous as those indebted for furniture, comprising 9 per cent of all families having such incomes, compared with 2 per cent indebted for purchases of furniture.

Below the $1000 level radios, 'other electric equipment', and miscellaneous commodities ranked closely together in frequency of financing on instalment terms. Between $1000 and $1750 refrigerators and 'other electric equipment' were, except for furniture and the increasing number of automobiles, the most frequent items financed. Above $1750 automobiles assumed the second rank, and above $2000 they were the commodity most frequently financed, refrigerators and 'other electric equipment' taking third and fourth places respectively.

In the figures on instalment debt by commodities each family appears once for each commodity purchased. Many families, of course, carry instalment debt on more than one commodity; comparison of the frequency of debt for all commodity groups (Table 7) with that for all families reporting a net change in

[12]See Table 9, which indicates what proportion of the families indebted for each commodity were increasing their debt.

[13]$500-1000 and $1000-1500; See Table 11.

[14]One cause of this relationship may be the fact that couples married less than a year, who might be expected to make large purchases of furniture, were excluded from the expenditure study. Such families, however, amounted to approximately 2 per cent of the families in the random sample.

[15]With one exception, electric refrigerators at the $500-750 income level.

Chart V

PERCENTAGE DISTRIBUTION OF ALL INSTALMENT DEBT CHANGES, 1935-1936, BY COMMODITIES

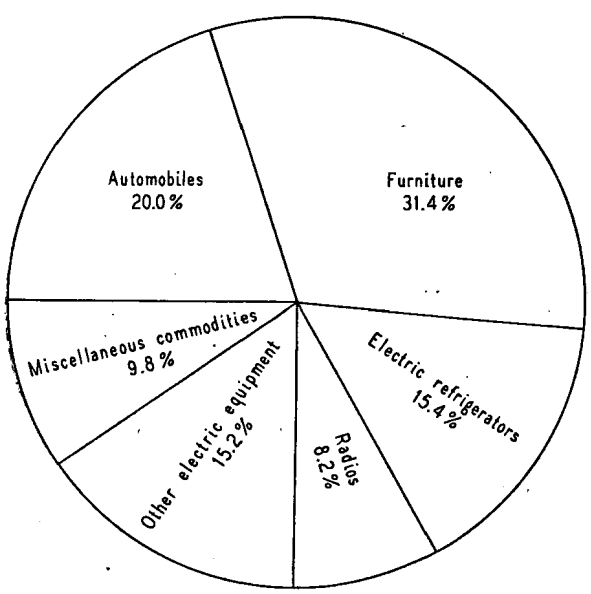


TABLE 5

Percentage Distribution of All Instalment-Debt Changes and of Increases and Decreases in Instalment Debt, 1935-1936, by Commodities[1]

COMMODITY	ALL INSTALMENT-DEBT CHANGES	INCREASES IN DEBT	DECREASES IN DEBT
Automobiles	20.0	22.5	14.6
Furniture	31.4	27.0	41.2
Electric refrigerators	15.4	14.5	17.4
Radios	8.2	9.4	5.8
Other electric equipment	15.2	15.9	13.5
Miscellaneous commodities	9.8	10.7	7.5
Total	100.0	100.0	100.0
Estimated total debt changes (in thousands of units)	3,799	2,618	1,181

[1]Based on data from metropolises and large and middle-size cities; the estimates of all debt changes do not cover changes for families living in small cities or villages, or on farms.

debt[16] indicates that as income rises there is an increasing tendency for families to be indebted for more than one commodity at a time. At the $3000 level this trend is reversed.

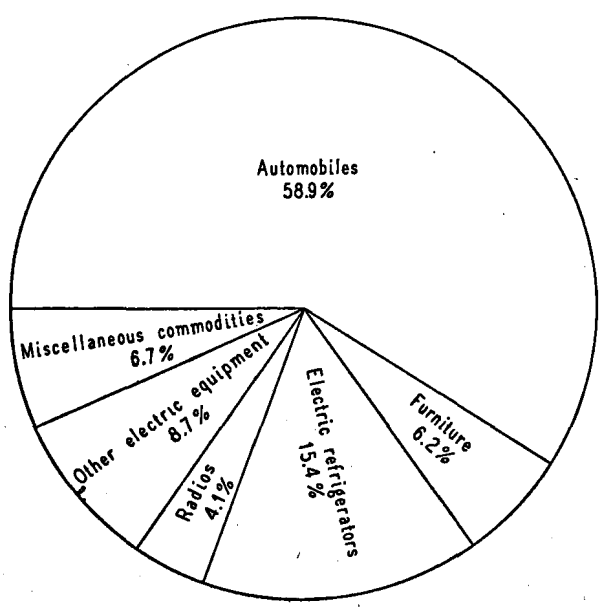
For all commodities except automobiles more than nine out of ten families indebted for instalment purchases had incomes of less than $3000, and eight out of ten families indebted for automobiles had incomes not exceeding this amount (Table 8). There were, however, marked differences in the commodity-buying behavior of various income groups. Thus while 25-30 per cent of families using instalment credit for purchases of furniture, radios, and miscellaneous commodities had incomes below $1000, this income group embraced only 6, 9, and 15 per cent of families indebted for automobiles, electric refrigerators, and 'other electric equipment' respectively. Again, though families with incomes under $2000 accounted for 76, 82, and 73 per cent of the instalment-debt changes for furniture, radio, and miscellaneous commodities respectively, only 46 per cent of families indebted for automobiles, 65 per cent of those making instalment payments on refrigerators, and 67 per cent of those paying for 'other electric equipment' were under this limit.

These differences seem to indicate a fairly consistent relationship between commodity price, purchaser's income, and the use of instalment credit to finance the purchase. Automobiles, which sell at high unit prices, were purchased on instalment mainly by the middle and higher income families. Electric refrigerators, also bearing relatively high unit prices, were purchased more often by medium than by higher income groups. Radios, on the other hand, which may sell for as little as $7 or $8, were bought on instalment less often than any other commodity, and principally by low income families. The wider dispersion of instalment purchasers of furniture, 'other electric equipment', and miscellaneous commodities, throughout all income levels, is probably due to the greater range of articles within each of these groups and to the wide price differences based on quality. In short, higher priced furniture is purchased on instalment by a higher income group than is lower priced furniture.

[16]These data too apply only to metropolises and large and middle-size cities. They are not presented in this Bulletin.

Chart VI

PERCENTAGE DISTRIBUTION OF NET INCREASE IN INSTALMENT DEBT, 1935-1936, BY COMMODITIES



6 The Pattern of Increases and Decreases in Instalment Debt by Income Groups

More families per hundred of population were increasing and more were decreasing instalment debts for furniture than for any other commodity (Table 9). But a smaller percentage of all families making instalment payments for furniture increased their obligations than of those paying on other commodities. While less than 60 per cent of the families indebted for furniture increased their debts, the percentages for other commodities ranked: about 77 per cent for automobiles and radios; 72 per cent for 'other electric equipment'; 76 per cent for miscellaneous commodities; and 64 per cent for electric refrigerators. The relatively low ratios for furniture and electric refrigerators may result from the fact that they are usually sold on longer terms than other commodities.

For each commodity the ratio of families increasing debt to those decreasing debt was higher in the lower income bands, and gradually decreased with each rise in income.[17] In the income groups below $2000 this ratio was above average, and it was

[17]The ratio for radios was an exception, however; it declined to the $2000 level and then rose almost steadily as income increased. But less than 18 per cent of radio instalment buyers had incomes above this level, and only 8 per cent had incomes above $2500.

Table 6

Percentage Distribution of Gross Increase, Gross Decrease, and Net Increase in Instalment Debt, 1935-1936, by Commodities[1]

Commodity	Gross Increase	Gross Decrease	Net Increase
Automobiles	50.5	36.7	58.9
Furniture	17.8	37.1	6.2
Electric refrigerators	14.6	13.2	15.4
Radios	3.4	2.1	4.1
Other electric equipment	7.8	6.3	8.7
Miscellaneous commodities	5.9	4.6	6.7
Total	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities. The net increase is the difference between the gross increase and the gross decrease in the obligations due on each commodity.

TABLE 7

Percentage of Non-Relief Families having a Net Change in Debt for the Instalment Purchase of Six Types of Commodities, 1935-1936, by Income Level[1]

ANNUAL INCOME	AUTO-MOBILES	FURNI-TURE	ELECTRIC REFRIG-ERATORS	RADIOS	OTHER ELECTRIC EQUIPMENT	MISCEL-LANEOUS COMMODITIES
Under $250	.2	10.9	.3	1.7	1.9	2.1
250— 500	.3	11.3	.6	2.4	2.0	2.4
500— 750	1.3	13.1	1.0	5.4	2.7	4.6
750—1000	3.4	15.6	4.0	3.7	5.1	3.9
1000—1250	4.8	13.7	6.1	4.6	6.8	4.8
1250—1500	6.1	13.5	6.3	3.3	7.2	4.1
1500—1750	7.8	13.1	8.9	3.5	6.4	2.9
1750—2000	10.1	11.9	9.6	3.6	7.6	4.7
2000—2500	12.5	10.9	8.6	2.5	6.5	3.6
2500—3000	14.5	11.2	7.1	1.6	8.2	2.9
3000—4000	12.6	8.0	5.7	1.4	4.9	3.1
4000—5000	11.4	6.0	4.6	.9	4.2	3.3
5000 and over	9.2	2.3	.9	.3	1.9	1.6
Total	7.5	11.8	5.9	3.1	5.8	3.7

[1]Based on data from metropolises and large and middle-size cities.

TABLE 8

Percentage Distribution of Non-Relief Families having a Net Change in Debt for the Instalment Purchase of Six Commodities, 1935-1936, Cumulated by Income Level[1]

ANNUAL INCOME	AUTO-MOBILES	FURNI-TURE	ELECTRIC REFRIG-ERATORS	RADIOS	OTHER ELECTRIC EQUIP-MENT	MISCEL-LANEOUS COMMOD-ITIES	ALL NON-RELIEF FAMILIES
Under $500	.2	5.9	.5	4.3	2.2	3.9	6.2
500— 750	1.5	14.1	1.8	17.2	5.7	13.2	13.6
750—1000	6.3	28.3	9.2	30.0	15.3	24.6	24.4
1000—1250	14.2	42.6	22.2	48.3	29.9	40.7	36.7
1250—1500	23.1	55.1	34.1	60.0	43.7	52.9	47.7
1500—1750	33.6	66.3	49.6	71.4	55.0	60.9	57.8
1750—2000	45.8	75.5	64.6	82.0	67.1	72.6	66.9
2000—2500	66.1	86.9	82.5	92.1	80.9	84.7	79.1
2500—3000	79.6	93.6	91.1	95.7	91.0	90.3	86.1
3000—4000	90.6	97.9	97.5	98.8	96.7	95.8	92.7
4000—5000	94.1	99.1	99.3	99.5	98.4	97.9	95.1
5000 and over	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities. Table 8 was derived from Table 7 by multiplying, for each income group, the number of non-relief families by the percentage of such families owing instalment debt, thus obtaining the number of families indebted and their distribution.

lower than average above that level, suggesting that the increase in instalment buying attendant on expanding business activity during 1935-36 was, for all commodities, greater among lower than among higher income classes. This is more striking when it is noted (Table 8) that most families indebted for instalment purchases received annual incomes of less than $2000.[18] This same tendency for income groups below $2000 to increase their instalment debt more than families above that level during this year of cyclical expansion is reflected in Table 10.[19] On the

[18]As has been pointed out, however, the majority of families indebted for instalment purchases of automobiles were in the higher income bands.

[19]It should be noted, however, that the data deal with only a part of the cyclical upswing. No data are available to indicate during which cyclical phase another income group exhibits a greater tendency to increase instalment debt.

Chart VII

PERCENTAGE OF NON-RELIEF FAMILIES HAVING A NET CHANGE IN DEBT FOR THE INSTALMENT PURCHASE OF SIX COMMODITIES, 1935-1936, BY INCOME LEVEL

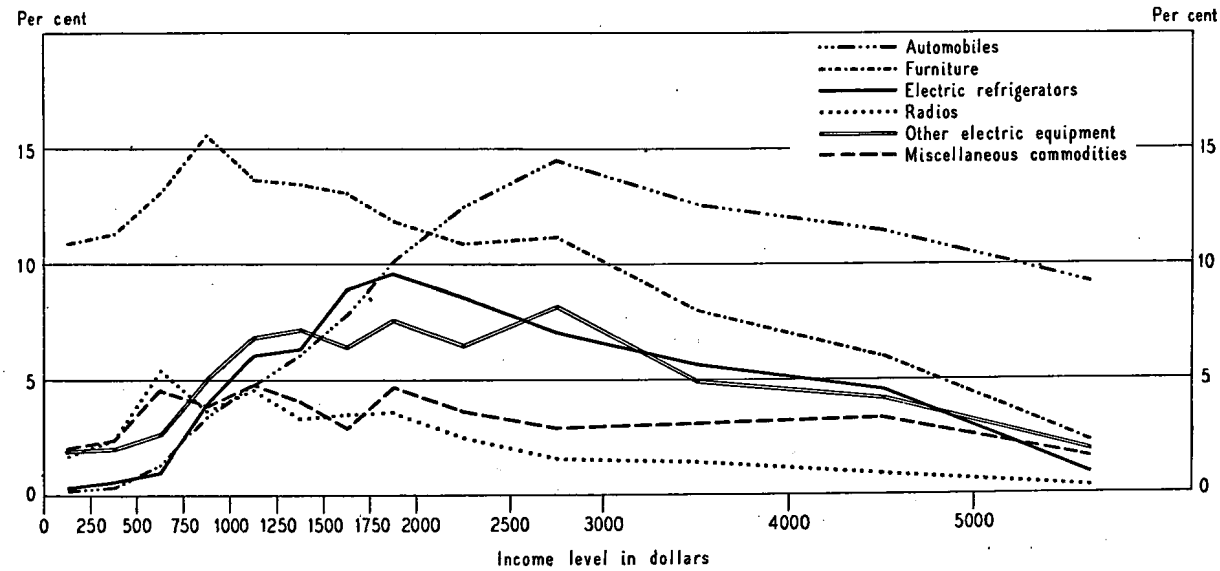


TABLE 9

Percentage of Non-Relief Families Increasing or Decreasing Instalment Debt for Six Commodities, 1935-1936, by Income Level[1]

ANNUAL INCOME	AUTOMOBILES		FURNITURE		ELECTRIC REFRIGERATORS		RADIOS		OTHER ELECTRIC EQUIPMENT		MISCELLANEOUS COMMODITIES	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
Under $500	.3	.0	7.5	3.6	.4	.2	2.0	.2	1.3	.7	2.1	.2
500—1000	2.1	.5	8.1	6.4	2.0	.8	3.7	.8	3.3	.8	3.6	.6
1000—1500	4.3	1.1	8.1	5.5	4.4	1.8	3.1	.9	5.2	1.9	3.2	1.3
1500—2000	7.3	1.6	7.9	4.6	6.0	3.3	2.5	1.0	5.1	1.9	2.9	.8
2000—2500	9.8	2.7	6.3	4.6	5.5	3.1	1.8	.7	4.7	1.8	2.6	1.0
2500—3000	10.5	4.0	6.7	4.5	3.9	3.2	1.3	.3	5.3	2.9	2.0	.9
3000—4000	8.7	3.9	4.3	3.7	3.3	2.4	1.3	.1	3.4	1.5	1.8	1.3
4000—5000	8.2	3.2	2.8	3.2	1.5	3.1	.7	.2	2.3	1.9	2.7	.6
5000 and over	7.2	2.0	1.3	1.0	.5	.4	.3	.0	1.2	7	.9	.7
Total	5.8	1.7	7.0	4.8	3.8	2.1	2.4	.7	4.2	1.6	2.8	.9

[1]Based on data from metropolises and large cities and middle-size cities.

whole, income groups under $2000 included larger proportions of all families increasing debt than of all families decreasing debt.[20] For instance, almost 50 per cent of families increasing automobile debts, but less than 40 per cent of those decreasing such debts, had incomes below $2000. This tendency was not so marked, however, for furniture; for radios it held good only up to the $1000 level, but, in contrast to most commodities, it reappeared after the $2500 level.

For every commodity class except furniture increases by debt-increasing families exceeded, on the whole, decreases by debt-decreasing families (Table 11). This tendency may reflect differences in the average age of instalment debt; it also suggests that unit purchases were for somewhat larger amounts or quantities during the expansion year 1935-36 than in the preceding year. As between types of commodities marked differences in average amounts of increase or decrease are apparent, arising mainly from the different unit prices of the items purchased; for example, average increase and average decrease were largest for automobiles and smallest for radios. Table 11 suggests that lower income families that use instalment credit buy goods of lower unit prices than do higher income families. For commodities that carry high unit prices, such as automobiles and electric refrigerators, the average increase in instalment debt was, in all income levels, related directly to income; for other commodities it showed this relationship up to the $3000-4000 level. A similar relationship obtained between average decrease and income, though for all commodity classes except furniture there was a

[20]Special exceptions in some income bands are to be noted: e.g., the $500-1000 band in the case of furniture; the $1000-1500 band in the case of miscellaneous commodities.

TABLE 10

Percentage Distribution of Non-Relief Families Increasing or Decreasing Instalment Debt for Six Commodities, 1935-1936, by Income Level[1]

ANNUAL INCOME	AUTOMOBILES		FURNITURE		ELECTRIC REFRIGERATORS		RADIOS		OTHER ELECTRIC EQUIPMENT		MISCELLANEOUS COMMODITIES	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
Under $500	.3	.0	6.7	4.7	.5	.5	5.1	1.9	1.9	2.8	4.7	1.5
500—1000	6.2	6.0	21.1	24.5	9.5	7.2	27.3	20.0	14.6	9.0	23.6	11.5
1000—1500	17.3	14.8	26.9	26.7	27.2	20.6	29.7	31.1	29.0	27.1	26.9	33.2
1500—2000	23.9	18.4	21.7	18.4	30.5	30.6	20.0	29.0	23.7	22.8	20.1	18.1
2000—2500	20.5	19.5	11.1	11.7	17.8	18.2	9.3	12.9	13.7	14.3	11.6	13.5
2500—3000	12.7	16.5	6.7	6.6	7.3	11.0	3.7	3.1	9.0	12.8	5.1	7.2
3000—4000	9.9	14.8	4.0	4.9	5.7	7.5	3.6	1.3	5.4	6.3	4.2	9.6
4000—5000	3.2	4.3	.9	1.5	.9	3.5	.7	.7	1.3	2.8	2.2	1.6
5000 and over	6.0	5.7	.9	1.0	.6	.9	.6	.0	1.4	2.1	1.6	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises, large cities and middle-size cities.

level of income at which a reversal of the tendency occurred. This again would seem to confirm the observation that the use of instalment credit is associated mainly with commodity purchases at prices and in quantities compatible with the family's income.

Table 12 shows, for the several groups of commodities, the distribution of estimated gross increase and gross decrease in instalment debt; it indicates that approximately half of both the gross increase and the gross decrease was attributable to the income groups between $1000 and $2000—except for automobiles, where the share approximated a third of the increase and a fourth of the decrease. Between a fourth and a third of gross increase and decrease was attributable to income groups between $2000 and $3000, but above this level and below the $1000 level widely varying proportions obtained. While families with incomes of less than $1000 originated approximately 20 and 24 per cent of the gross increase in furniture and radio debts, respectively, they created only 9 per cent of the increase in electric refrigerator debt and less than 3 per cent of the increase in automobile debt. For every commodity except automobiles and the miscellaneous group, only a minor share of gross increase or decrease originated with families having incomes above $4000, and below $500 the share was minor for every type of commodity.

In general, for all commodities except radios, the lower income groups (those below the $2000 level) were responsible for a larger proportion of the gross increase than of the gross decrease in debt. Conversely, higher income families had a relatively larger share of the gross decrease. In the case of radios, families in income groups below $1500 and above $2500 had larger proportions of gross increase, whereas those between these levels had a larger share of gross decrease.

It is important to note also (from a comparison of Tables 10 and 12) that the share of gross increase or decrease in debt attributable to lower income families was less than proportionate to the number of debt-increasing or debt-decreasing families in these bands. For example, 77 per cent of all families increasing furniture debts had incomes below $2000, but these families created only 69 per cent of the gross increase in such debt. On the other hand, in the higher income levels the share of the gross increase or decrease was more than proportionate to the number of families; in the case of automobiles the income bands above $2000 included 52 per cent of the families increasing debt and 62 per cent of the gross increase in automobile debt. In the lower income levels, however, there was a comparatively greater concentration of families increasing obligations and of the gross increase in debt. Table 13 shows that, except for automobile purchases, by far the largest part of the increased instalment debt outstanding at the end of the period 1935-36 was the result of purchases made by lower-income families. Thus the distribution of the net increase was more nearly proportionate to the distribution of families having a change in instalment debt (Table 8), except in the case of furniture, where almost the entire net increase occurred in income levels below $2000.

7 The Pattern of Instalment Debt by Types of Communities

Families receiving equivalent incomes but living in different types of communities vary considerably in instalment-debt behavior. Table 14, based on data covering the instalment purchases of all commodities combined, indicates that in 1935-36 the frequency of instalment debt was greatest in urban communities. One out of every three families living in large cities, just under this number in middle-size and small cities, and one out of five metropolitan families,[21] were indebted for instalment purchases. Debt occurred in one out of four village families—

[21]Metropolitan families are defined as those living within the city limits of metropolises.

Table 11

Average Increase and Decrease in Instalment Debt Incurred by Non-Relief Families in the Purchase of Six Commodities, 1935-1936, by Income Level[1]

Annual Income	Automobiles		Furniture		Electric Refrigerators		Radios		Other Electric Equipment		Miscellaneous Commodities	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
Under $500	$ 33	$ —	$ 44	$ 56	$ 87	$ 37	$ 33	$ 10	$ 16	$ 23	$ 20	$ 3
500—1000	111	129	59	58	109	47	30	21	48	33	43	17
1000—1500	177	125	72	70	109	65	44	30	49	37	54	48
1500—2000	257	202	81	90	115	72	44	42	59	48	61	65
2000—2500	265	271	91	111	122	79	53	53	70	50	98	73
2500—3000	288	263	106	153	120	76	59	38	63	52	103	55
3000—4000	320	294	115	128	126	89	50	21	72	45	171	75
4000—5000	382	439	82	131	158	89	29	64	71	48	118	106
5000 and over	416	335	118	298	156	72	30	—	53	75	129	149
Total	259	242	76	86	115	73	41	35	56	44	66	58

[1]Based on data from metropolises and large and middle-size cities. 'Average increase' refers to families having an increase, and 'average decrease' to those having a decrease in debt.

slightly more often than among those in metropolitan areas—and only one out of nine farm families had instalment debt.

The less extensive use of instalment credit by families living in metropolises compared with those living in other cities is in part due to less frequent ownership of automobiles. Higher automobile operating costs and the greater adequacy of transport facilities, as well as the higher cost of living in general, are the primary factors which operate against automobile ownership in metropolitan areas.[22]

The lower prevalence of debt among farm families can probably be traced to the irregular flow of agricultural income, which militates against a credit plan calling for regular monthly payments over a long period. Besides this, farmers, as entrepreneurs, tend to intermix production and consumption finance, and to obtain their credit accommodation more frequently from specialized farm credit agencies.[23] Instalment buying by farm families is confined mainly to automobiles and farm equipment, and it is facilitated by special contracts adjusted to the irregularity of farm income.

Table 14 and Chart VIII show by income levels the prevalence of instalment debt in each type of community. Generally speaking, it rose with income to the $2000 level, then tapered off through the higher income brackets; but in large cities the decline did not set in until the $3000 income level, and in farm communities the peak was not reached until the $2500-3000 level. In each income class under $5000 the frequency of debt was highest among families in large cities,[24] where instalment debt was owed by more than one-fifth of families with incomes below $500 and by almost two-fifths of families with incomes of $1500 to $3000. Families who lived in small cities ranked second in frequency of debt up to $3000, after which those in medium-size cities took second rank. Village families ranked fourth up to about the same level.

Metropolitan families with incomes below $1000 made little more use of instalment credit than did farm families with equivalent income; and only a little more than one-fifth of metropolitan families with incomes of $1000 to $3000 had instalment debt. It is interesting to note that instalment debt among farm families was more general in income levels above $2000 (where it averaged about one-sixth) than it was for families below this level.

Table 15, representing a special analysis, by commodities, of families indebted for instalment purchases in the North Central region, indicates that in the urban communities of this region

[22] In this connection see *How Urban Families Spend Their Incomes* (July 1938), a study by the U. S. Bureau of Labor Statistics, Table 9C.

[23] It is also possible that farm families make use of the easy payment plans of mail order houses to a greater extent than city families, and use this short-term financing as a substitute for longer-term instalment credit.

[24] With the exception of the $1500-2000 income level, where frequency of debt was slightly higher in small cities.

TABLE 12

Percentage Distribution of Gross Increase and Gross Decrease in Instalment Debt for Six Commodities, 1935-1936, by Income Level[1]

ANNUAL INCOME	AUTOMOBILES[2]		FURNITURE		ELECTRIC REFRIGERATORS		RADIOS		OTHER ELECTRIC EQUIPMENT		MISCELLANEOUS COMMODITIES	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
Under $500	[3]	.0	3.9	3.0	.4	.2	4.1	.5	.5	1.5	1.5	.1
500—1000	2.7	3.1	16.4	16.4	9.0	4.7	20.0	11.9	12.6	6.7	11.3	3.4
1000—1500	11.8	7.7	25.4	21.6	25.5	18.6	31.8	27.3	25.2	22.8	22.7	27.4
1500—2000	23.8	15.4	23.3	19.2	30.4	30.5	21.5	35.1	24.7	24.9	19.4	20.5
2000—2500	21.0	21.9	13.1	15.0	18.7	20.0	11.9	19.7	17.1	16.1	18.0	16.9
2500—3000	14.1	18.1	9.4	11.7	7.6	11.6	5.4	3.4	10.1	15.0	8.2	6.7
3000—4000	12.2	18.0	6.1	7.3	6.2	9.2	4.4	.8	6.9	6.4	11.5	12.4
4000—5000	4.8	7.9	1.0	2.3	1.3	4.3	.5	1.3	1.6	3.0	4.2	2.8
5000 and over	9.6	7.9	1.4	3.5	.9	.9	.4	.0	1.3	3.6	3.2	9.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Estimated total change (in millions)	152.1	41.4	53.5	41.9	43.8	14.9	10.1	2.3	23.5	7.1	17.8	5.2

[1] Based on data from metropolises and large and middle-size cities. Therefore the estimates of total change do not represent the total change in instalment debt for the country as a whole. 'Gross increase' refers to families having an increase in debt and 'gross decrease' to those having a decrease.

[2] The reader must be cautioned against comparing these estimates of automobile instalment debt, derived from the Consumer Purchases data, with estimates that may be derived from the U. S. Department of Commerce figures on automobile instalment sales, for the two sets of data are different in nature and coverage.

[3] Less than .05 per cent.

furniture purchases were the most frequent base of instalment debt, while in villages and on farms automobile purchases were most important. Automobiles were second most important in urban centers, 'other electric equipment' third, and electric refrigerators fourth.

Table 16, also applying to communities in the North Central region, indicates the distribution, among the various types of communities, of families indebted for each of the six commodities. Large and small cities are shown to have included the largest percentage of instalment debtors of all commodities except the miscellaneous group. Although only one-third of the population of the region lives in large and small cities, these communities together included 50 per cent or more of the families indebted for furniture, electric refrigerators, radios, and 'other electric equipment', and 43 per cent of families indebted for the instalment purchases of automobiles.

On the other hand, the proportion of instalment debtors that lived in metropolises tended to be smaller than the metropolitan share of regional population, except that the proportion indebted for furniture and miscellaneous items slightly exceeded the metropolitan share of population. There was some variation in middle-size cities. They were relatively well represented among families indebted for electric refrigerators and 'other electric equipment' and slightly under-represented in miscellaneous instalment purchases, but they had about a proportionate number of families indebted for purchases of automobiles, furniture, and radios.

The villages' share of families indebted for instalment purchases of automobiles, 'other electric equipment' and miscellaneous commodities was roughly in proportion to their share of population, but they were under-represented among families indebted for furniture, electric refrigerators, and radios. Farm families, constituting 17 per cent of the regional population, did not have instalment debt for any commodity commensurate with their numerical importance in the population, although in the case of automobiles and miscellaneous commodities the disproportion was slight. The extremely low percentage of farm families among buyers of electric appliances is due in large measure to the lack of electric power facilities in farm areas.

TABLE 13

Percentage Distribution of Net Increase in Instalment Debt for Six Commodities, 1935-1936, by Income Level[1]

ANNUAL INCOME	AUTOMOBILES	FURNITURE	ELECTRIC REFRIGERATORS	RADIOS	OTHER ELECTRIC EQUIPMENT	MISCELLANEOUS COMMODITIES
Under $500	.1	7.1	.5	5.1	.1	2.0
500—1000	2.5	16.4	11.1	22.4	15.1	14.5
1000—1500	13.4	39.5	29.2	33.2	26.2	20.9
1500—2000	26.9	38.0	30.5	17.5	24.7	18.9
2000—2500	20.7	6.5	18.1	9.6	17.5	18.5
2500—3000	12.7	1.2	5.5	6.0	8.0	8.8
3000—4000	9.9	1.2	4.6	5.4	7.1	11.2
4000—5000	3.6	[2]	[3]	.2	1.0	4.7
5000 and over	10.2	[2]	.8	.6	.3	.5
Total	100.0	100.0[2]	100.0[3]	100.0	100.0	100.0
Estimated net increase (in millions)	110.8	11.6	28.9	7.8	16.4	12.6

[1]Based on data from metropolises and large and middle-size cities. The estimates of the net increase in outstandings do not represent the total net increase for the country as a whole.

[2]The total is actually 109.9 per cent because there was a net decrease in debt in the $4000-5000 income levels (3.8 per cent) and in the $5000 and over (6.1 per cent).

[3]The total is actually 100.3 per cent because of a net decrease in debt in the $4000-5000 income level of 0.3 per cent.

8 Regional Differences in the Use of Instalment Credit

The use of instalment credit varies not only with types of communities but also with geographic regions. Table 17, which is based on data from all types of communities in five major regions, shows that the frequency of instalment debt was highest in the Pacific region, where practically one out of every three families had such debt, compared with one out of four families in the Southern, New England, and Mountain-and-Plain regions, and one out of five in the North Central region.[25] The frequency of debt in the North Central region was influenced, of course, by the low frequency of debt obtaining in metropolitan centers in this area.

Comparison by income levels brings out other regional differences which are shown in Chart IX. The lead of the Pacific region in prevalence of debt obtained generally only at income levels below $2000; above this level the frequency of debt was greatest in the South and was particularly striking for families above the $4000 income level, of whom about one-fourth had instalment debt. The highest frequency of debt in the Pacific region was 42 per cent, occurring in the $1500-2000 income group; in the South it was 41 per cent, in the $2000-2500 income group.

The Mountain-and-Plain region ranked third in instalment indebtedness above the $750 level, with 35 per cent indebted in the $1500-2000 band; the New England peak was 27 ($1000-1500) and that of the North Central region was 25 ($1500-2000). The North Central region (embracing the more populous industrial states) had the lowest frequency of debt in every income band up to $2000, and above that level New England had a slightly lower debt frequency.

Also for individual commodities the prevalence of instalment debt varied considerably by geographic region. Table 18, based on data covering metropolises, large cities, and middle-size cities, shows that in each commodity group, except miscellaneous items, debt frequency was higher in the Pacific region and in the South than it was in the country as a whole. In New England it

[25]This table, showing the percentage of families having a net change in instalment debt in each income level, does not reveal the influence of the varying distributions of income in the different regions on regional variations in the use of instalment credit. The figures for the total percentage of families indebted in each region do, however, reflect these varying income distributions. See also Table 19, footnote 1.

was somewhat higher for furniture and miscellaneous merchandise, but lower for other commodities. In the Mountain-and-Plain region it was slightly lower than average for electric refrigerators, higher for others. For all commodity groups instalment debt in the North Central states was below the average in frequency.

TABLE 14

Percentage of Non-Relief Families in Different Types of Communities having a Net Change in Instalment Debt, 1935-1936, by Income Level[1]

ANNUAL INCOME	METROPOLISES	LARGE CITIES	MIDDLE-SIZE CITIES	SMALL CITIES	VILLAGES	FARMS	ALL COMMUNITIES
Under $500	3.1	20.5	12.9	17.5	11.8	8.2	11.9
500—1000	11.7	30.2	23.6	26.9	22.0	9.9	19.2
1000—1500	20.2	34.3	32.2	35.8	26.1	12.3	26.1
1500—2000	22.6	39.5	37.1	37.4	31.0	13.9	30.2
2000—2500	21.2	39.5	33.7	33.9	30.1	17.0	30.2
2500—3000	23.5	39.4	30.1	31.6	26.2	17.9	29.3
3000—4000	22.0	32.0	25.4	21.6	21.6	13.4	23.8
4000—5000	16.2	25.6	24.9	20.1	23.6	15.1	21.5
5000 and over	13.3	14.0	14.1	16.2	17.9	17.3	15.0
Total	18.6	33.6	28.3	30.5	24.0	11.5	23.6

[1]Metropolises, 1,500,000 population and over; large cities, 100,000 to 1,500,000; middle-size cities, 25,000 to 100,000; small cities, 2,500 to 25,000; villages, less than 2,500.

The prevalence of furniture, refrigerator, and radio debt was greatest in the South. One out of five Southern families had furniture debt, one out of eight had refrigerator debt, and one out of twenty had radio debt. This might suggest that Southern families were buying these household items—both for cash and on instalment—more frequently than were families elsewhere; other family expenditure data available from the Study of Consumer Purchases, however, fail to show any striking regional differences in expenditure for household furnishing and equipment.[26] These figures therefore seem to indicate a tendency among Southern families to purchase such commodities on instalment rather than for cash.

Frequency of instalment debt for automobiles was highest in the Mountain-and-Plain region; one out of seven families in this region had such debt, compared with one out of nine in the Pacific and Southern regions and one out of seventeen in New England and North Central states. The expenditure data referred to above[27] show that in the latter two regions a smaller percentage of families bought cars in 1935-36, and that proportionately fewer families owned cars, than in the West and South. These regional differences in the pattern for instalment purchases

[26]Bureau of Labor Statistics, *How Urban Families Spend Their Incomes* (July 1938), Tables 8A and 8B.

[27]*Ibid.*, Tables 9A and 9C.

Chart VIII

PERCENTAGE OF NON-RELIEF FAMILIES IN DIFFERENT TYPES OF COMMUNITIES HAVING A NET CHANGE IN INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL

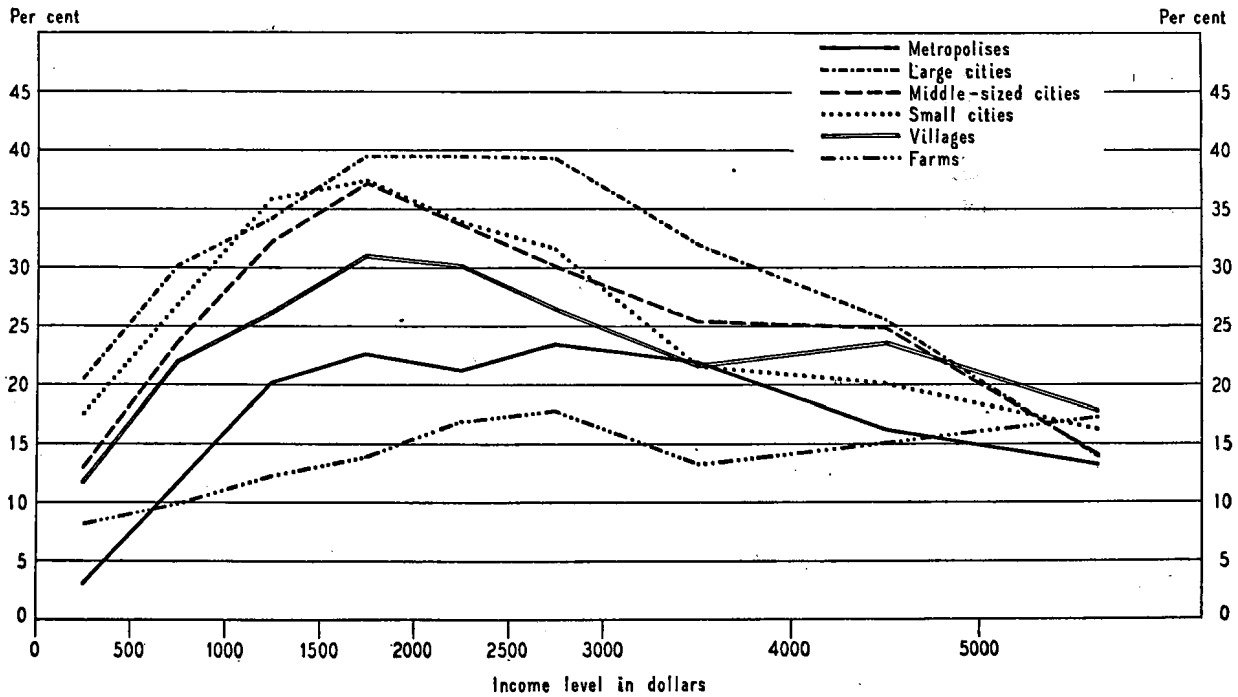


TABLE 15

Percentage of Non-Relief Families in the North Central Region having a Net Change in Debt for the Instalment Purchase of Six Commodities, 1935-1936, by Type of Community

TYPE OF COMMUNITY	AUTO-MOBILES	FURNI-TURE	ELECTRIC REFRIG-ERATORS	RADIOS	OTHER ELECTRIC EQUIP.	MISCEL-LANEOUS COMMODITIES
Metropolises	3.8	7.6	3.0	1.8	3.0	3.8
Large cities	8.4	12.8	5.6	2.9	6.4	3.8
Middle-size cities	6.5	7.4	5.0	1.7	5.1	2.9
Small cities	8.1	9.5	5.9	2.6	6.6	3.1
Villages	6.8	3.0	2.2	1.2	3.7	4.7
Farms	5.7	.6	.1	.9	.2	3.4

TABLE 16

Percentage Distribution of Non-Relief Families in the North Central Region having a Net Change in Debt for the Instalment Purchase of Six Commodities, 1935-1936, by Type of Community

TYPE OF COMMUNITY	AUTO-MOBILES	FURNI-TURE	ELECTRIC REFRIG-ERATORS	RADIOS	OTHER ELECTRIC EQUIP-MENT	MISCEL-LANEOUS COMMOD-ITIES	ALL NON-RELIEF FAMILIES
Metropolises	13.6	25.2	19.4	22.0	16.9	23.7	22.8
Large cities	22.1	31.4	26.7	26.2	26.7	17.5	16.8
Middle-size cities	11.5	12.2	16.0	10.3	14.3	9.0	11.3
Small cities	21.1	23.0	27.9	23.3	27.2	14.1	16.6
Villages	16.3	6.7	9.5	9.8	14.0	19.6	15.3
Farms	15.4	1.5	.5	8.4	.9	16.1	17.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

of automobiles reflect higher living costs in the North Central and New England regions, as well as the fact that families in heavily populated areas have less need for automobile transportation than families in regions of more scattered population.

Table 19, which presents, by commodities, the regional distribution of families indebted for instalment purchases, shows that well over two-fifths of families indebted for commodities in the five main groups, and three-fifths of families indebted for miscellaneous products, lived in the North Central region. Even these high proportions are low compared to the general population, for this region contains more than three-fifths of all urban non-relief families.

The South had the second largest share of instalment debtors, its proportion ranging from 16 per cent of the families who bought miscellaneous articles to 35 per cent of the families who bought refrigerators. The proportion was in each case (except miscellaneous purchases) larger than the Southern share of the urban population.

In all groups except miscellaneous products the Pacific region

Chart IX

PERCENTAGE OF NON-RELIEF FAMILIES IN DIFFERENT REGIONS HAVING A NET CHANGE IN INSTALMENT DEBT, 1935-1936, BY INCOME LEVEL

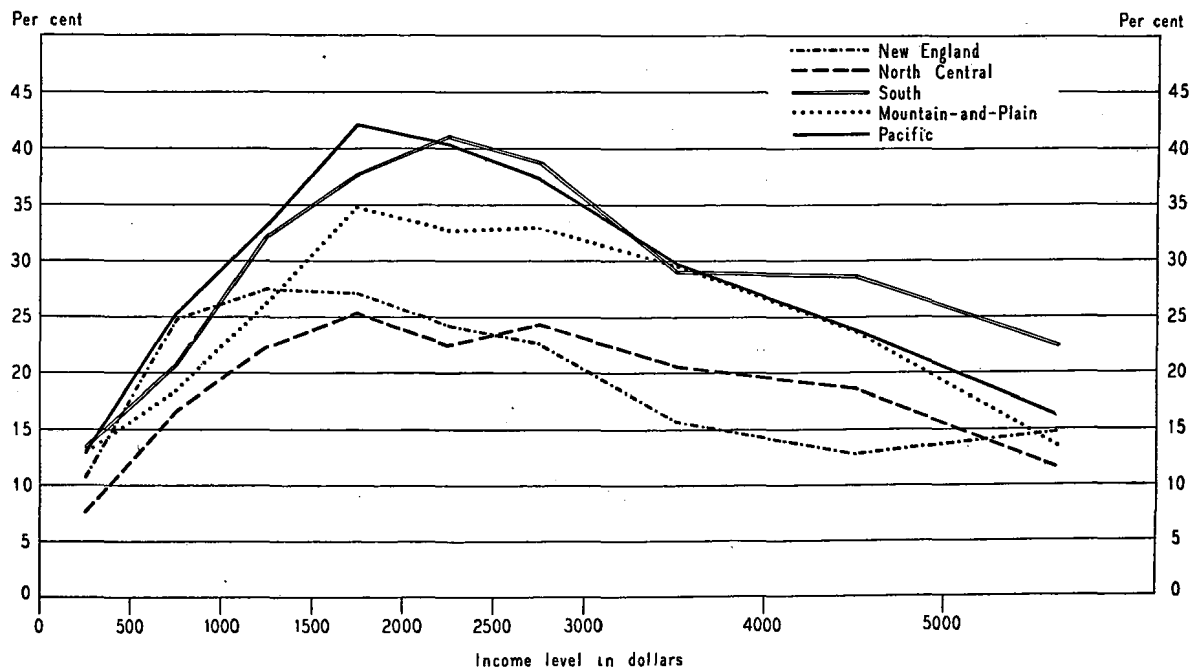


TABLE 17

Percentage of Non-Relief Families in Different Regions[1] having a Net Change in Instalment Debt, 1935-1936, by Income Level

ANNUAL INCOME	NEW ENGLAND	NORTH CENTRAL	SOUTH	MOUNTAIN-AND-PLAIN	PACIFIC	ALL REGIONS
Under $500	10.7	7.6	13.3	13.0	13.0	11.9
500—1000	24.7	16.5	20.6	18.4	25.2	19.2
1000—1500	27.5	22.3	32.1	26.2	33.6	26.1
1500—2000	27.1	25.4	37.6	34.8	42.1	30.2
2000—2500	24.3	22.5	41.0	32.7	40.3	30.2
2500—3000	22.7	24.4	38.8	33.0	37.4	29.3
3000—4000	15.7	20.6	29.0	29.5	29.7	23.8
4000—5000	12.8	18.7	28.8	23.6	23.7	21.5
5000 and over	14.8	11.6	22.4	13.5	16.2	15.0
Total	24.3	20.3	25.9	24.6	32.6	23.6

[1]New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
North Central: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Pennsylvania, Wisconsin
South: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
Mountain-and-Plain: Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah, Wyoming
Pacific: California, Oregon, Washington.

had the third largest share of instalment debtors; it included one-tenth of all furniture debtors and almost one-fifth of 'other electric equipment' debtors, although less than a tenth of the urban families reside in this region. New England and the Mountain-and-Plain states contributed the smallest percentages of families

TABLE 18

Percentage of Non-Relief Families having a Net Change in Debt for the Instalment Purchase of Six Commodities, 1935-1936, by Region[1]

REGION	AUTOMOBILES	FURNITURE	ELECTRIC REFRIGERATORS	RADIOS	OTHER ELECTRIC EQUIPMENT	MISCELLANEOUS COMMODITIES
New England	6.0	12.9	3.1	2.6	3.9	4.2
North Central	5.9	9.2	4.3	2.2	4.5	3.6
South	11.0	19.9	11.9	5.7	7.4	3.6
Mountain-and-Plain	15.2	14.6	5.6	3.5	9.6	5.8
Pacific	11.0	12.5	7.8	4.9	11.2	3.4
Total	7.5	11.8	5.9	3.1	5.8	3.7

[1]Based on data from metropolises and large and middle-size cities.

indebted for the instalment purchase of each commodity,[28] the shares being roughly in proportion to urban population in these regions.

In each region more than two out of three families having instalment debt were increasing their debts during the expansion year 1935-36. Table 20, presenting distributions, by six commodity groups, of families having increases or decreases in instalment obligations, indicates a tendency in the populous and highly urbanized North Central region for a proportionately greater number of families to increase than decrease debt for all commodities except furniture and radios. In the South, on the other hand, a considerably larger proportion of families were

[28]With one exception, miscellaneous merchandise, for which the Pacific region had the second lowest per cent and New England the third lowest.

TABLE 19

Percentage Distribution of Non-Relief Families having a Net Change in Debt for the Instalment Purchase of Six Commodities, 1935-1936, by Region[1]

REGION	AUTOMOBILES	FURNITURE	ELECTRIC REFRIGERATORS	RADIOS	OTHER ELECTRIC EQUIPMENT	MISCELLANEOUS COMMODITIES	ALL NON-RELIEF FAMILIES[2]
New England	6.8	9.2	4.4	7.0	5.6	9.5	8.4
North Central	48.8	48.8	45.8	43.4	49.5	60.9	62.2
South	24.9	28.6	34.5	31.4	21.8	16.4	17.1
Mountain-and-Plain	5.6	3.4	2.7	3.1	4.6	4.3	2.8
Pacific	13.9	10.0	12.6	15.1	18.5	8.9	9.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities. Therefore the influence of the varying prevalence of village and farm communities in the different regions does not affect the regional differences shown in this table. Since regional variations in instalment-debt behavior during 1935-36 are shown to exist, and since approximately 70 per cent of all instalment-debt families are urban inhabitants, it would appear that there were also variations in consumer instalment-debt response as between similar types of communities in different regions. The data which furnished the basis for our preceding analysis of debt-change by type of community were drawn only from the North Central region. Types of communities in the South, for example, would be expected to have patterns of cyclical response for different commodity groups conforming, with variations among communities, to that shown here for the region as a whole.

It will be possible, on the basis of data now in preparation, to present a comparison of the use of instalment credit by income levels in the same type of community in different regions, so that the influence of regional location on the use of instalment credit can be viewed more directly.

[2]Adapted from *Consumer Incomes in the United States*, Appendix B, Table 24B.

TABLE 20

Percentage Distribution of Non-Relief Families Increasing or Decreasing Instalment Debt for Six Commodities, 1935-1936, by Region[1]

REGION	AUTOMOBILES		FURNITURE		ELECTRIC REFRIGERATORS		RADIOS		OTHER ELECTRIC EQUIPMENT		MISCELLANEOUS COMMODITIES	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
New England	6.5	7.4	8.5	10.3	4.4	4.5	6.9	7.2	5.9	5.3	10.4	6.7
North Central	50.3	43.9	48.1	49.1	49.2	39.1	43.6	44.7	51.1	43.3	61.7	56.9
South	23.8	29.1	30.8	25.9	29.7	43.8	32.4	27.0	20.6	25.9	17.5	13.6
Mountain-and-Plain	5.2	6.7	3.5	3.3	2.7	2.5	2.6	4.7	4.3	5.6	3.7	7.6
Pacific	14.2	12.9	9.1	11.4	14.0	10.1	14.5	16.4	18.1	19.9	6.7	15.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities.

decreasing debts for automobiles, electric refrigerators and 'other electric equipment' than were increasing them. Other regions had, in four out of six commodity groups, a somewhat larger proportion of families decreasing than increasing debts, though in practically every case the difference was nominal.

Table 21, which distributes gross increase and decrease in debt for each commodity group by regions, shows how the tendencies noted above were reflected in the distribution of gross increase and gross decrease in debt. Families in North Central states incurred a larger proportion of gross increase than of decrease in instalment debt for all commodities except furniture, where they were responsible for 57 per cent of the total decrease and 50 per cent of the increase. The South incurred a larger share of gross decrease than of increase in debt for electric refrigerators, automobiles, radios, and miscellaneous products, and only in the case of furniture and 'other electric equipment' was the South responsible for a larger share of gross increase than of gross decrease in debt. The differences in the proportions of gross increase and decrease attributable to other regions were not striking, and conformed approximately to those for the distribution of families having increases or decreases.

During the year 1935-36 each region incurred a net increase in total instalment debt for every one of the six commodity groups. Table 22 shows that North Central states originated about half or more of the net increase in debt for every commodity group except furniture, but only a quarter of the increase for furniture. The South accounted for more than half of the increase in furniture debt, and from a fifth to a fourth of the debt-increase for the other principal commodity groups. The Pacific region ranked second as a source of debt-increase for only one group, miscellaneous electric equipment, and was the third important source of debt for electric refrigerators, automobiles, and radios.

This analysis of changes in instalment debt by commodities

TABLE 21

Percentage Distribution of Gross Increase and Gross Decrease in Instalment Debt for Six Commodities, 1935-1936, by Region[1]

REGION	AUTOMOBILES		FURNITURE		ELECTRIC REFRIGERATORS		RADIOS		OTHER ELECTRIC EQUIPMENT		MISCELLANEOUS COMMODITIES	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
New England	5.9	5.9	7.8	7.8	5.2	5.0	6.0	4.8	5.9	6.1	8.0	5.2
North Central	51.7	44.3	50.4	57.2	51.1	43.6	50.7	42.7	45.5	45.1	65.9	59.2
South	21.8	30.0	27.7	20.7	29.0	39.5	27.6	34.5	20.9	19.3	13.2	15.8
Mountain-and-Plain	5.2	7.7	4.4	3.4	2.3	2.5	3.0	4.7	3.8	7.1	4.5	7.2
Pacific	15.4	12.1	9.7	10.9	12.4	9.4	12.7	13.3	23.9	22.4	8.4	12.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities.

TABLE 22

Percentage Distribution of Net Increase in Instalment Debt for Six Commodities, 1935-1936, by Region[1]

REGION	AUTOMOBILES	FURNITURE	ELECTRIC REFRIGERATORS	RADIOS	OTHER ELECTRIC EQUIPMENT	MISCELLANEOUS COMMODITIES
New England	5.9	7.6	5.3	6.4	5.8	9.0
North Central	54.5	25.3	55.0	53.2	45.9	68.5
South	18.7	53.4	23.6	25.4	21.5	12.1
Mountain-and-Plain	4.2	8.2	2.1	2.5	2.3	3.5
Pacific	16.7	5.5	14.0	12.5	24.5	6.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1]Based on data from metropolises and large and middle-size cities.

during a given period of business expansion suggests that there were substantial variations by geographic regions in the cyclical response of consumers toward debt. During this period the South liquidated instalment obligations on all commodities except furniture to a greater extent than any other region, whereas in the North Central region the prevailing tendency was toward an increase in instalment debt for all groups of commodities except furniture. Such variations reflect, of course, the combined play of many factors: the type of regional economy, agricultural or industrial; the stage of regional development; the distribution of regional family income; the degree of regional urbanization or population concentration; the regional lead in cyclical movements and the amount of regional business expansion; cultural or social attitudes toward debt; and perhaps many others.

APPENDIX

METHODS OF ESTIMATE AND LIMITATIONS OF THE DATA

The expenditure data obtained from the Study of Consumer Purchases were based on a selected sample of 60,000 families drawn from a larger random sample of 300,000 families. The data supplied to the National Bureau by the two government agencies had already been weighted by the random sample weights, and all of the original field samples of each type of community and color-nativity group had been combined within each region to form some fifty basic tabulation units. The problem, then, of building up instalment-debt estimates for the country as a whole was to combine these fifty separate series into one overall tabulation. The process of combination may be illustrated in terms of the data showing the percentage of families increasing instalment debt.

In some types of communities data were available for six separate occupations; in others they were already combined into from two to five occupational groups. Data for each type of community were put on a uniform basis by combining the various occupations into two groups, using weights from the random sample of 300,000 families. One group comprised salaried and independent professional, salaried, and independent business and clerical workers; the other included only wage earners.

The first combination made was of data available from two samples of the same occupational and color-nativity group in one type of community within the same region. Data for non-relief families in each occupational group in New York and Chicago, and in small and middle-size cities in the East Central and West Central regions,[1] were combined by obtaining an unweighted average in each income group. Farm data in regions other than the South were combined by weighting each percentage by population weights provided by the National Resources Committee.[2] Data for each color-nativity and farm status group in the South[3] were combined by using unweighted averages. These unweighted color-nativity and farm status series were then consolidated by the use of population weights, resulting in a single series to represent Southern farms. The data for white and Negro families in each occupational group in the other degrees of urbanization in the South, and in the metropolises and large cities in the North Central region, were then combined by weighting the series for each color group by the appropriate population weights.[4]

Our final combinations were of data for each occupational group in each type of community in the five regions: metropolises, large cities, medium-size cities, small cities, villages, farms. The two occupational groups in each type of community were then combined and for each income group a weighted average of the percentage in the six degrees of urbanization was obtained which represents the United States as a whole. Tables showing a regional breakdown were developed separately by combining first the two occupational groups in each community within a region, and then by combining all the types of communities within each of the five regions.

In developing tables showing change in instalment balance due, that is, average increase or decrease, combinations were made by using unweighted averages in all cases where the percentages of the families having an increase or decrease in debt were initially derived in this way. Where weights were required, they were developed for both increases and decreases in debt by multiplying the population by the percentage of families having

[1]The East and West Central regions together form the North Central.

[2]Thus the series of percentages representing North Central farms are a weighted average of the data for Pennsylvania and Ohio, Illinois and Iowa, and Michigan and Wisconsin farms.

[3]Separate tabulations were made for white operators, white sharecroppers, Negro operators, Negro sharecroppers, in North and South Carolina, and in Georgia and Mississippi farm counties and in North Carolina for 'self-sufficing' farmers.

[4]What are here called population weights are in effect the distributions of families in the United States by income level, color, and nativity, type of community and region. The income distributions of various groups of farm communities within regions have not been published, but were made available to us by the National Resources Committee. All other income distributions which we have used as weights can be found in *Consumers' Incomes in the United States*.

an increase or decrease. Thus separate weights were obtained for each commodity group.

Tables showing the changes in instalment debt incurred on individual commodities are confined to data from middle-size cities, large cities, and metropolises. Tables which show a breakdown by type of community and by commodity are derived from special tabulations which cover, in addition, small cities, villages and farms in the North Central region only. Our analysis of variations in the use of instalment credit for different commodities by type of community is therefore restricted to communities in the North Central region. These data on individual commodities are somewhat limited, and it is necessary to exercise some caution in extending the results to the country as a whole, for, as indicated in the text, the smaller communities have a different pattern of instalment debt from that of the larger communities.

Various limitations and difficulties are involved in the use of material from the Study of Consumer Purchases. The expenditure study included in its scope only families who had not received relief during any part of the year. Thus families on relief and single individuals, both relief and non-relief, were excluded from the data. The omission of relief families and of single persons receiving relief is probably not of great importance in a study of the use of instalment credit, since their low incomes and inferior credit rating bar them from most instalment purchases. Non-relief single individuals, however, are a significant group whose pattern of instalment debt may differ from that for families.

Another factor of some importance is the lack of data for foreign-born families. Separate estimates were not attempted for this group either, but on the assumption that its pattern of debt would not differ enough to affect the results greatly, the foreign-born white population was combined with the native white to weight the data for the latter group. Other color groups, an insignificant proportion of population, were added to the Negro population.

Data were lacking in some types of communities for the lowest income groups, and in others for the highest income groups. No figures were available, for instance, for native white families with incomes under $500 in large cities and metropolises, or for families with incomes under $250 in middle-size and small cities and villages, though such families were covered in farm counties. In some cases the data for all small-city families with incomes of $3000 and more were combined. In regard to villages and farms data were generally lacking for the income groups over $10,000.

The deficiencies of the data for the very low and high income groups necessitated special estimates of their debt patterns. One possible method was to extrapolate on the basis of the pattern for the intermediate income groups, using some mathematical equation to express a trend from which estimates for the omitted groups could be derived. This method was rejected, however, for three reasons: first, the error of estimate is large, even with the best mathematical procedure; second, because of the relatively smaller number of families included in individual tabulation units, the trend in some cases was not clear, making it difficult to choose an equation; third, the amount of labor entailed was considered too great.

Actually, families in the income bands for which estimates were required form less than 4 per cent of the total non-relief population, as well as a relatively insignificant proportion of the families in the particular communities for which estimates were made. Whatever the estimates, their effect on the pattern of instalment debt as a whole could be only slight. We therefore adopted a simpler and easier alternative.

In making estimates of the percentage of families in the lowest income band having an increase or decrease in instalment debt, we applied to the $250-500 band the percentage change between the figures for that band and for the $500-700 band, when at least a partial trend was evident. Where no trend was evident between the next higher income classes we arbitrarily borrowed the figure in the adjoining income group. Where no trend at all was apparent, the average of all income levels was used, but only to estimate the percentage of families having debt and not to estimate average amount of increase or decrease. In making the latter estimates the most frequent procedure employed was either to borrow the average of the next higher income level or to apply to the $250-500 income group the percentage change between the averages for that group and for the $500-750 group. It was sometimes necessary to make the estimate on the basis of the trend in another type of community or color-nativity group, but this was rarely done.

The final results thus obtained for the income class under $250 and, to a lesser extent, for $250-500, are only approximate, but they are sufficiently accurate to warrant their use, in view of the relative insignificance of the groups for which these estimates are being made. Tables which show the percentage distribution of families incurring instalment debt, as well as those which indicate the distribution of the debt burden among income levels, regions, types of communities or commodities, are affected only slightly by the quality of the estimates.

One other qualification of the data should be made. When the expenditure schedule was filled out the family was asked only if there had been a change, that is, either an increase or a decrease, in instalment debt as between the beginning and the end of the schedule year. Thus the data which represent the percentage of families having a net change in debt, or what we have called those indebted for instalment purchases, do not include families who, during the course of the year, contracted an additional amount of instalment debt exactly equal to the amount paid off. But this does not present a very serious drawback, especially since families reported even very small amounts of increase or decrease in debt. Because of the nature of the data, however, we were unable to include families who contracted and fully paid off instalment debt within the year period. We are therefore to some extent underestimating the number of families who made use of instalment credit or were indebted for instalment purchases during the year 1935-36.

National Bureau of Economic Research

Ralph A. Young, Director of the Financial Research Project of the National Bureau, is Associate Professor of Economics and Chairman of the Department of Economics, Wharton School, University of Pennsylvania.

Blanche Bernstein is research assistant of the Financial Research Project staff of the National Bureau. Previously she was a member of the Consumption research staff of the industrial section of the National Resources Committee.

IN PRESS

Studies in Income and Wealth, Volume Three

In contrast to the preceding two volumes, which were devoted primarily to problems centering about the meaning and measurement of total national income and wealth, the third volume is made up of papers concerned with problems centering about the division of a national total, of either wealth or income, into meaningful constituents. The first three papers deal with the division of the total among groups of income recipients or wealth holders classified by size of income or amount of wealth owned. The fourth is an attempt to estimate the portion of total income that is saved rather than used to purchase goods currently consumed. The fifth is a review of the available allocations of income by the kinds of goods and services that make up the total income stream and a plea for better measures in this field. The sixth considers the problems involved in allocating the total income of the nation among political units, the states; and the seventh, the usefulness of such an allocation for the purpose of measuring relative capacities of the states as a guide in distributing grants in aid. The titles and authors are:

Part One

AMERICAN STUDIES OF THE DISTRIBUTION OF WEALTH AND INCOME BY SIZE

CHARLES L. MERWIN, JR.
Bureau of Foreign and Domestic Commerce
United States Department of Commerce

Part Two

INCOME CAPITALIZATION AS A METHOD OF ESTIMATING THE DISTRIBUTION OF WEALTH BY SIZE GROUPS

CHARLES STEWART
Brooklyn College

Part Three

THE USE OF INCOME TAX DATA IN THE NATIONAL RESOURCES COMMITTEE ESTIMATE OF THE DISTRIBUTION OF INCOME BY SIZE

ENID BAIRD
Bureau of Foreign and Domestic Commerce
United States Department of Commerce
AND
SELMA FINE
National Resources Planning Board

Part Four

VOLUME AND COMPONENTS OF SAVING IN THE UNITED STATES, 1933-1937

R. W. GOLDSMITH *with the assistance of* W. S. SALANT
Securities and Exchange Commission

Part Five

THREE ESTIMATES OF THE VALUE OF THE NATION'S OUTPUT OF COMMODITIES AND SERVICES—A COMPARISON

CLARK WARBURTON
Federal Deposit Insurance Corporation

Part Six

SOME PROBLEMS INVOLVED IN ALLOCATING INCOMES BY STATES

ROBERT R. NATHAN
Bureau of Foreign and Domestic Commerce
United States Department of Commerce

Part Seven

INCOME AND THE MEASUREMENT OF THE RELATIVE CAPACITIES OF THE STATES

PAUL H. WUELLER
Pennsylvania State College

The commentators on these papers are: Simon Kuznets, Milton Friedman, Fritz Lehmann, Gerhard Colm, M. A. Copeland, E. L. Dulles, A. G. Hart, Harold Groves, A. J. Goldenthal, Gordon Keith, J. L. Martin, and Hans Neisser.

The price of Volume Three, which will consist of about 500 pages, will be $3.50. Volume One, described in *Bulletin 66*, sells for $2.50; Volume Two, described in *Bulletin 72-73*, for $3. A special price of $7.50 is offered on the three volumes together.

PRICE SERIES

Stephen J. Kennedy, Chairman of the Committee on Textile Price Research, has completeted his revision of the Committee's report which will be published before the end of the year as number 2 in the Price Series.

Myron W. Watkins, Chairman of the Committee on Price Research in the Petroleum Industry, has also made final revisions of his Committee's report. Although it too is in press, publication may be delayed until the report of the Committee on Prices in the Iron and Steel Industry has been brought up to date. The two reports may then be bound in one volume.

PRODUCTION AND PRODUCTIVITY

The National Bureau is happy to announce another grant by the Maurice and Laura Falk Foundation to enlarge the scope of its studies of production and productivity. The new grant will make possible an investigation of production and productivity in non-manufacturing industries since 1899. The manuscript of the first volume of the series of studies—Production in Manufacturing Industries, 1899-1937—is being revised by Solomon Fabricant and will be submitted to the Board of Directors of the National Bureau for approval by the end of the year.

The Statistical Pattern of Instalment Debt

OFFICERS

GEORGE SOULE, *Chairman*
DAVID FRIDAY, *President*
W. L. CRUM, *Vice-President*
SHEPARD MORGAN, *Treasurer*
W. J. CARSON, *Executive Director*
MARTHA ANDERSON, *Editor*

DIRECTORS AT LARGE

C. I. BARNARD, *President, New Jersey Bell Telephone Company*
H. S. DENNISON, *Dennison Manufacturing Company*
G. M. HARRISON, *Pres., Brotherhood of Railway and Steamship Clerks*
O. W. KNAUTH, *President, Associated Dry Goods Corporation*
H. W. LAIDLER, *Executive Director, League for Industrial Democracy*
L. C. MARSHALL, *The American University*
GEORGE O. MAY, *Price, Waterhouse and Company*
SHEPARD MORGAN, *Vice-President, Chase National Bank*
G. E. ROBERTS, *Economic Adviser, National City Bank*
BEARDSLEY RUML, *Treasurer, R. H. Macy and Company*
GEORGE SOULE, *Director, The Labor Bureau, Inc.*
N. I. STONE, *Consulting Economist*

DIRECTORS BY UNIVERSITY APPOINTMENT

W. L. CRUM, *Harvard*
E. E. DAY, *Cornell*
GUY STANTON FORD, *Minnesota*
F. P. GRAHAM, *North Carolina*
H. M. GROVES, *Wisconsin*
W. H. HAMILTON, *Yale*
H. A. MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
A. H. WILLIAMS, *Pennsylvania*

DIRECTORS APPOINTED BY OTHER ORGANIZATIONS

F. M. FEIKER, *American Engineering Council*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
MALCOLM MUIR, *National Publishers Association*
W. W. RIEFLER, *American Statistical Association*
MATTHEW WOLL, *American Federation of Labor*

RESEARCH STAFF

WESLEY C. MITCHELL, *Director*

A. F. BURNS
SOLOMON FABRICANT
MILTON FRIEDMAN
SIMON KUZNETS
F. R. MACAULAY
F. C. MILLS
D. L. WICKENS
LEO WOLMAN
R. A. YOUNG
EUGEN ALTSCHUL, *Associate*

NATIONAL BUREAU OF ECONOMIC RESEARCH BULLETINS

Annual Subscription (5 issues), $1; single copies, this issue, 50 cents

National Bureau of Economic Research

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Bulletin 79 1819 BROADWAY, NEW YORK *September 1, 1940*

Copyright, 1940, National Bureau of Economic Research, Inc.

The Volume of Consumer Instalment Credit, 1929-1938

DUNCAN McC. HOLTHAUSEN
Research Associate, Financial Research Staff, National Bureau of Economic Research

in collaboration with

MALCOLM L. MERRIAM
Chief, Credit Analysis Unit, Marketing Research Division, Bureau of Foreign and Domestic Commerce, United States Department of Commerce

and

ROLF NUGENT
Director, Department of Consumer Credit Studies, Russell Sage Foundation

One of the most notable developments in our national economy during the past few decades has been the growth of credit extended to consumers on instalment terms. In recent years there has been an increasing recognition of the fact that this type of credit is exerting a profound and widespread influence on national purchasing habits, on methods of distribution and finance, and on the whole financial structure of the country.

While the importance of consumer instalment credit is undisputed, discussion of its exact influence has been hampered by the scarcity of adequate statistical data about it. True, the Russell Sage Foundation recently published a comprehensive series of figures for the outstanding amount of consumer credit as a whole, broken down by types of credit agency; but the nature of its material prevented segregation of instalment credit, which is undoubtedly the most significant part of the whole. Previous estimates of this particular type of credit have been based on data either fragmentary or incomplete in coverage.

This bulletin presents the first consistent series of annual and monthly estimates of the volume of consumer instalment credit, covering the period from 1929 to 1938 inclusive. The data were prepared as a collaborative undertaking of the National Bureau of Economic Research, the Russell Sage Foundation and the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. For several years prior to the present collaborative effort, each of these agencies was independently studying some phase of consumer credit, and interpreting its growth and change. The final development of the estimates presented in this bulletin constitutes an outstanding illustration of the fruitfulness of cooperative research.

In preparing the estimates it was necessary to draw upon many sources, and to request special information from a number of private agencies actively engaged in consumer instalment financing. These requests were received with uniform cordiality, and we take pleasure in acknowledging the generous contributions of material. Methods of estimate were submitted to a number of specialists in the field and their criticisms and suggestions are likewise acknowledged with appreciation.

Because of gaps in the basic working materials, methods for estimating were modified according to availability of data. Consequently, we can attribute only approximate accuracy to these figures. Future revisions to increase the precision and value of the series will be made, however, as materials become more abundant and working methods more exact.

In view of the continuing need of business and public agencies for such data, the United States Department of Commerce has agreed to bring these series up to date and to maintain them on a current basis in the future. The collection of data and preparation of estimates, which has already begun, is centralized in the Credit Analysis Unit of the Division of Marketing Research, Bureau of Foreign and Domestic Commerce.

JAMES W. YOUNG, Director
Bureau of Foreign and Domestic Commerce
U. S. Department of Commerce
RALPH A. YOUNG, Director
Financial Research Program
National Bureau of Economic Research

THE TERM consumer instalment credit, as employed in this study, means credit extended to consumers which requires them to repay principal and interest in prescheduled amounts at regular intervals. Consumer instalment credit as thus defined is extended by two types of institutions—retail establishments selling goods, and cash-lending agencies, which advance funds. Accordingly, the estimates presented in this monograph were derived from two bodies of data—retail instalment sales and cash instalment loans. The retail establishments here included fall into six classifications: dealers in new and used passenger automobiles, department stores, furniture stores, household appliance stores, jewelry stores, and a miscellaneous group of "all other stores." Institutions offering cash instalment loans include five groups —personal loan departments of commercial banks, credit unions, industrial banking companies, personal finance companies, and unregulated lenders. To supplement the estimates for these five types of cash-lending agencies, a sixth series was developed covering loans insured by the Federal Housing Administration under Title I of the National Housing Act. This series includes all notes of $2,000 or less which may be considered consumer credit.

Four phases of instalment credit are covered by our study—the volume of credit granted, the volume of repayments, the amount of outstanding receivables, and the net credit change. The first two are self-explanatory. Outstandings represent the difference between credit granted and repayments; i.e., the amount of consumer instalment debt in existence at a specified point of time; average outstandings represent the mean amount of such debt in existence over a specified interval of time. Net credit change is the change in outstandings during a specified time interval.

Except where otherwise noted, all series extend from 1929 through 1938, both annually and monthly, and cover four items—credit granted, repayments, outstandings, and net credit change.

The types of retail establishments for which estimates of instalment credit were developed are classified in general according to the *1935 Census of Business*.[1] The automobile dealer group constitutes the one important exception; the estimates for this group were worked out from numbers of cars sold, as reported to the Automobile Manufacturers Association. The instalment transactions of establishments which are not treated in the present survey are primarily grants of producer credit as distinguished from consumer credit.

Estimates for the five types of institutions in the cash loan group are based upon compilations of the Russell Sage Foundation,[2] whose classifications have been followed with regard to both definition and coverage. The estimates for loans insured under Title I of the National Housing Act are derived from data contained in annual reports of the Federal Housing Administration.

The reader is cautioned to bear in mind the following characteristics and limitations of the estimates prepared in this study:

1. All outstandings estimates listed by type of retail establishment represent the amount of consumer debt originating in retail instalment sales regardless of whether the retailer himself carries the instalment paper as an account receivable item or has sold part or all of the instalment paper to outside agencies (i.e., sales finance companies, commercial banks, industrial banking companies, and all other purchasers of consumer instalment notes from retailers).

2. Prepayments of instalment accounts, renewals of notes, delinquencies and repossessions are not accounted for in the repayments and outstandings estimates for the automobile dealer series.

3. Estimates of credit granted for all types of cash-lending institutions include renewals of old loan balances; the repayments series include accounting collections on loans renewed. Thus the amount of credit granted (or loans made) by cash-lending agencies cannot be considered to refer exclusively to *new* cash advanced, and the volume of repayments to such agencies cannot be considered to refer only to repayments on new loans.

4. Repayments include charge-offs on bad loans in all series except that for automobile dealers.

5. Interest charges are not included in the personal finance company series, since this type of agency makes its charge each month on the unpaid balance and does not include the charge as a part of the amount of the loan or as a part of the loan balance outstanding. Roughly three-fourths of all credit unions use a similar lending technique and, to that extent, the credit union series exclude interest charges.

6. The series on loans insured by the Federal Housing Administration contain a small amount of duplication with other series in the study.

A monograph under the same title as this Bulletin, to be published shortly, will present complete tables covering all the series herein described. Appendix D of this monograph describes in detail the methods of estimate employed for the several instalment credit series, and indicates the limitations to which they are subject.

[1] See *Census of Business: 1935*, Retail Distribution, vol. 1, pp. 4-03 through 4-08.

[2] See Russell Sage Foundation, *Consumer Credit and Economic Stability*, by Rolf Nugent (1939), Ch. XIII.

Estimates of Retail Instalment Credit

According to our estimates, the dollar amount of consumer debt arising from retail instalment transactions reached an all-time peak in 1937. In that year average outstandings totaled $2,641,300,000, the volume of credit granted was $3,666,800,000, and repayments came to $3,392,400,000.

During the ten-year period covered by our estimates, the low point for credit granted was 1932, when it stood at $1,363,500,000. Its 1933 volume was $1,584,100,000, 16 percent above 1932. Because debts incurred just prior to and during 1932 were paid off at an unusually slow rate, average outstandings did not reach their low point ($1,052,500,000) until a year later than credit granted. The peak years for these two items were widely separated; credit granted was highest in 1929, when it amounted to $4,298,400,000, but average outstandings did not reach their high point until 1937. This divergence between the peak of outstandings and that of credit granted reflects increasingly liberal credit terms during the ten-year period, particularly the tendency to increase the length of contracts, since any increase in contract length tends to prolong the time during which a given amount of credit remains outstanding.

Retail credit granted, repayments, and average outstandings fluctuated widely in amount and showed similar percentage changes from their peak to trough and trough to peak years. Between 1929 and 1932 credit granted decreased 68 percent; between 1932 and 1937 it increased 169 percent. Repayments and average outstandings declined 64 percent and 57 percent respectively between 1929 and 1933, and rose 136 percent and 151 percent respectively between 1933 and 1937.

Despite the striking increase in credit granted from 1932 to 1937, its volume in 1937 was approximately 15 percent below the 1929 peak. Repayments during 1937 were 9 percent lower than in 1929, whereas average outstandings were 7 percent above 1929.

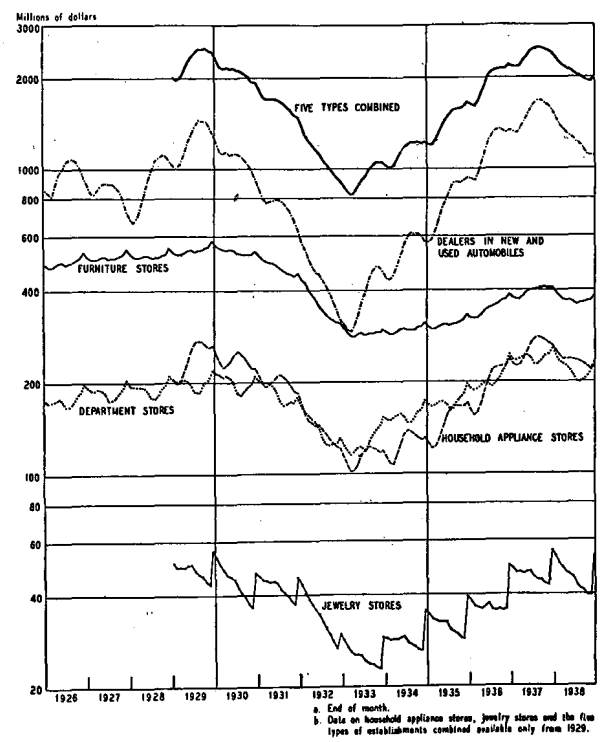
The three items, however, showed somewhat different cyclical patterns. The volume of credit granted declined rapidly from the 1929 figure; in 1930 it fell off 22 percent. Repayments and average outstandings declined only slightly, the former dropping 2 percent and the latter 6 percent. In 1933, credit granted rose 16 percent over 1932, but repayments to liquidate instalment debt declined 28 percent, and average outstandings declined 18 percent. In 1938 there was a sharp decline in the volume of credit granted, but only a moderate decrease in repayments and in average outstandings.

Month-end retail instalment indebtedness over the ten-year period was highest at the end of September 1937 and lowest at the end of March 1933. Before 1933, retail instalment debt had been highest at the close of October 1929. It seems reasonable to suggest, therefore, that the cycles in retail instalment debt move closely with the general swings of business.

There were marked fluctuations in outstanding debt from peak to low months of business activity. For example, from October 1929 to March 1933 there was a decrease of 67 percent in the end-of-month outstandings, followed by an increase of 220 percent from March 1933 to September 1937, to a point 6 percent above the previous peak at the close of October 1929. A decrease of 24 percent occurred between September 1937 and December 1938. Chart I presents month-end outstandings for the five principal retail series, combined and singly.[3]

Chart I

MONTHLY TOTALS OF INSTALMENT OUTSTANDINGS[a] FOR FIVE TYPES OF RETAIL ESTABLISHMENTS AND FOR THE FIVE TYPES COMBINED[b] 1926–1938



a. End of month.
b. Data on household appliance stores, jewelry stores and the five types of establishments combined available only from 1929.

There are two key reasons for these wide cyclical swings in retail instalment credit. First and most important, the consumer instalment market tends to center about high-priced durable goods, which consumers are not likely to purchase in periods of depression when

[3] "All other stores" omitted.

they are unsure of their future income, but which they do acquire in periods of recovery when their economic outlook seems brighter. Second, credit grantors do not wish to make deferred payment sales or loans to individuals whose incomes do not meet the qualifications for an acceptable deferred payment risk. Naturally, therefore, in periods of economic decline many individuals to whom instalment credit facilities had hitherto been available might find themselves automatically disqualified from the use of such credit as a result of reduced incomes or unemployment.

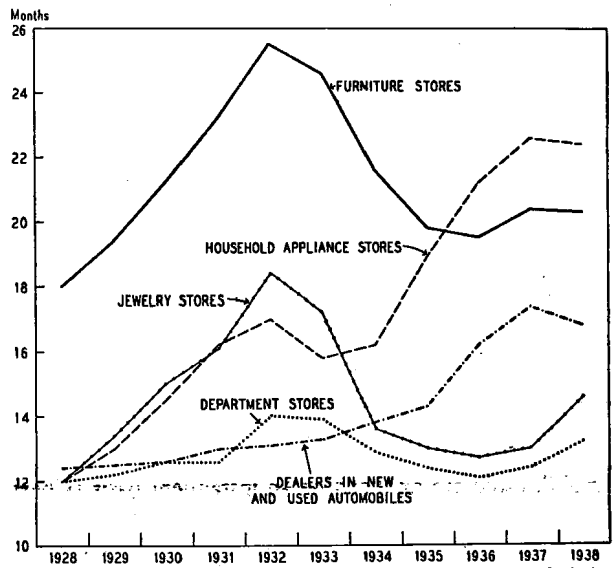
Of the five types of retail establishments shown in Chart I, month-end outstandings arising from instalment sales of automobiles declined most sharply in the period of business recession 1929–33, falling off 80 percent from August 1929 to March 1933. Instalment debt occasioned by department store sales showed the least violent drop, yet fell 48 percent from December 1929 to March 1933. Decreases for the other three types of retail establishments ranged between these extremes. Increases from these 1933 low points to the 1937 high points show similar tendencies among the various outlets. Automobile instalment debt rose 475 percent, reaching a point 16 percent above its preceding peak in August 1929; while department store debt increased one-fourth as much (123 percent), reaching a point 17 percent above its preceding peak, in December 1929. Instalment debt incurred through household appliance stores and jewelry stores rose 175 percent and 143 percent respectively from the low points of 1933 to the high points of 1937; compared to 1929 levels household appliance store debt was 2 percent higher and jewelry store debt was about the same. Retail sales of furniture revived slowly, and debt from this source rose only 44 percent between 1933 and 1937, the 1937 figure being about one-third lower than the 1929 level.

Throughout the period studied, automobile purchases were the most important single source of retail instalment credit. In 1929 they were 55.4 percent of all such credit, and in 1937 they were 58.4 percent. In 1932, however, automobile instalment credit granted was only 42.3 percent of the total, and in 1938 it was 50.9 percent, while the percentages for department stores and for "all other stores" increased in those years. The percentage of total credit extended by department stores averaged 12 percent during this period; by furniture stores, 15 percent; by household appliance stores, about 10 percent; by "all other stores," about 10 percent; and by jewelry stores, between 2 and 3 percent.

The duration of instalment indebtedness, which represents the average length of time consumed in paying out debts, varied from 12 to 26 months over the ten-year period covered by our estimates.[4] On the average, it was longest for the furniture store group, where the payment period ranged from 18 to 26 months, and shortest for the department store group, where it was about 12 months.[5] Chart II presents the average duration of instalment indebtedness in each of the 5 principal types of establishments.

Chart II

AVERAGE DURATION OF INSTALMENT INDEBTEDNESS[a] IN FIVE TYPES OF RETAIL ESTABLISHMENTS 1928–1938



a. Data on automobiles (passenger cars only) refer to formal length of contract and not to actual duration of indebtedness.

The duration of consumer indebtedness increased markedly during this ten-year period, especially in household appliance financing, for which the average paying-out time lengthened from 12 to 22 months. The entrance of government agencies into the instalment financing field may account to a large degree for this rapid liberalization of financing arrangements, since it encouraged public utilities to sell appliances on contracts extending for 36 months, and lending institutions to advance instalment loans for property improvement on terms of similar length.

The rapid rise in the duration of consumer instalment indebtedness during 1930–32 is a direct result of delays in repayments occasioned by the recession. The continued effect of bad times upon repayments was still in evidence during 1933, when the duration of indebtedness decreased but slightly. A return to more normal times in 1934 is indicated by the abrupt decline in the time required for instalment debt liquidation.

[4] This duration of indebtedness is not the same as contract length, i.e., the specified number of months of an original sales contract.

[5] This represents an average of payment periods varying from 3 months for clothing (10-week payment plan) to 36 months or longer for refrigerators.

Contract length for automobile instalment sales rose gradually from 12 to 17 months during the period covered by the data. In the case of automobile purchases, duration of indebtedness refers to the original contract length rather than to the actual time consumed in paying off the debt. These figures, therefore, do not show the effects of delinquent accounts, prepayments and note renewals as they do for the other retail groups.

Of two retail establishments extending the same amount of instalment credit, the one which allows the longer period for repayment will have on its books a greater proportion of the resultant instalment outstandings. The percent of total credit granted by each type of retail establishment, compared with its percent of total average outstandings, therefore illustrates differences in the payment period among the different types. In 1929, furniture stores accounted for 22 percent of total average outstandings, but for only 16 percent of the total credit granted, indicating that the average payment period in furniture retailing is longer than for retail establishments in general. The department store and automobile dealer series show greater proportions of total credit granted than of total outstandings, reflecting shorter average maturities in these two groups than prevail for all retail groups as a whole.

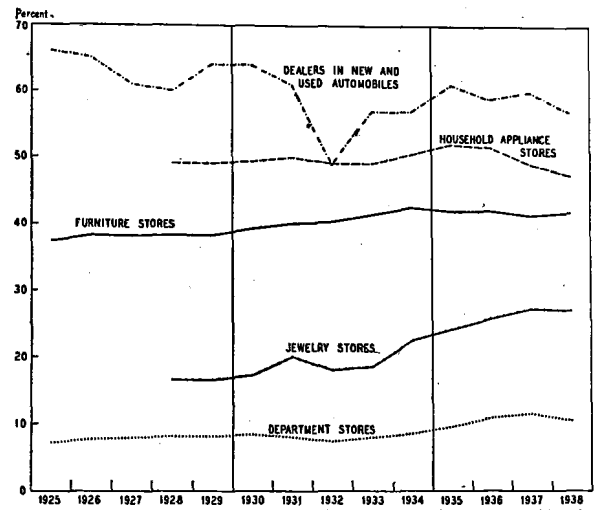
Approximately 60 percent of the number of all automobiles sold are financed on an instalment basis (Chart III). Household appliance and furniture stores also do a large instalment volume; the proportion ranged between 40 and 50 percent of their total sales during the ten-year period. Instalment sales amounted to 27 percent of total jewelry store sales in 1937, and department store instalment sales amounted to 12 percent. Instalment selling in these two types of stores increased gradually over the ten-year period studied.

In the automobile dealer group the percentage of cars sold on an instalment basis decreased. This decline may be attributed in part to the growing importance of the replacement market in the automobile trade. As a result, more buyers have used cars to trade in against both new-car and used-car purchases.[6] To such buyers the value of "trade-ins" is tantamount to cash. When a great many purchasers have that start toward the purchase of a car, some of them who otherwise would have to buy on a time-payment basis will find that they can raise the rest of the money necessary to buy for cash. Perhaps another factor responsible for the decline in the percent of cars sold on an instalment basis is the fact that cash-lending agencies grant an increasing number of direct cash loans to be applied to automobile purchases. Such a purchase appears in the automobile dealer's records as a cash sale, although the loan itself is paid off in monthly instalments.

[6] See "Composite Experience of Sales Finance Companies and Automobile Dealers," an annual publication of the National Association of Sales Finance Companies.

Chart III

INSTALMENT SALES AS A PERCENT OF TOTAL SALES OF EACH OF FIVE TYPES OF RETAIL ESTABLISHMENTS[a] 1925–1938



a. Data on household appliance and jewelry stores available only from 1928. In the case of automobile dealers the percentage figures apply to units of passenger cars sold; for other groups the total figures apply to volume of sales.

INDIVIDUAL RETAIL SERIES

Automobile Dealers

The total amount of instalment credit granted for automobile purchases was over $2,000,000,000 in each of three years—1929, 1936 and 1937. Average outstandings were highest in 1937, when they totaled $1,523,900,000, and repayments were highest in 1929, amounting to $2,143,200,000. Credit granted dropped 76 percent from 1929 to its lowest point in 1932, while outstandings declined 70 percent and repayments 71 percent from 1929 to 1933. Between 1933 and 1937, however, credit granted rose 271 percent, repayments 218 percent, and average outstandings 303 percent. Despite these marked increases, credit granted and repayments were one-tenth lower in 1937 than in 1929; average outstandings, however, were one-fifth higher. The greatest drop in outstandings in a single year took place in 1938, when they decreased by $440,200,000 or 28.4 percent.

Instalment sales for the automobile group, as reflected in credit extended, show wide seasonal movements, as indicated in Chart IV–A. May and June are the most important months for credit granting, and outstandings reach a seasonal peak during the fall months. Beginning with 1935, when new car models were introduced at the end of each year, credit granted and out-

standings show slight increases in December and January. For the most part the repayments curve is smooth, distinguished by little seasonal movement.[7]

Department Stores

Instalment credit grants by department stores reached a peak in 1937 of $441,200,000, an 18 percent increase over the 1929 total. The low year in credit granted was 1932, when the volume was $211,300,000—a 43 percent decrease from 1929. Average outstandings declined 37 percent between 1929 and 1933, then rose to their highest point in 1937 ($238,800,000). Repayments, like credit granted, rose 18 percent between 1929 and the peak year 1937, when they totaled $429,900,000. The greatest changes in outstandings took place in 1932 and in 1936; in the former year outstandings decreased $49,000,000 and in the latter they increased by the same amount. In general, the year-to-year movements of the several credit items in the department store series were much less marked than in the automobile series.

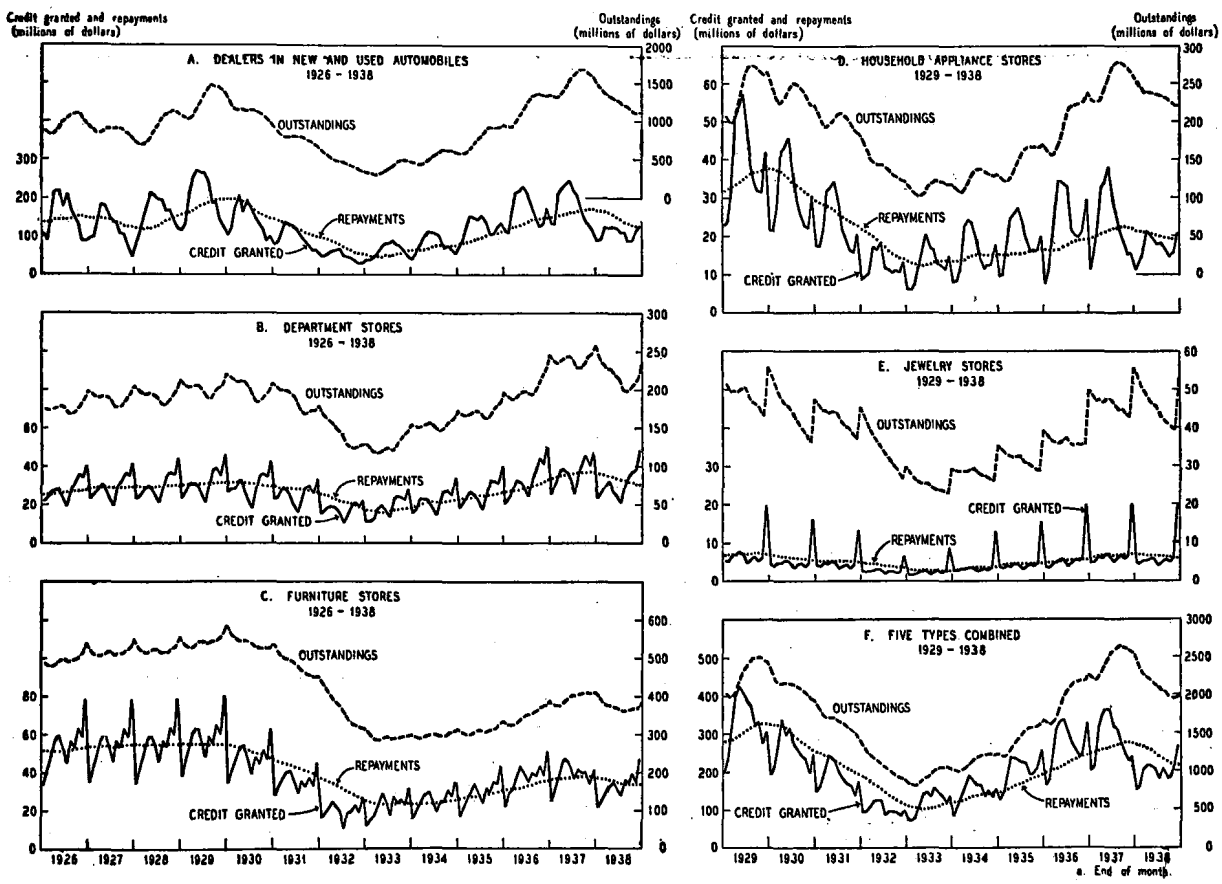
Monthly estimates for department stores show significant seasonal variations, which appear in Chart IV-B. As in the automobile series, outstandings vary less than credit granted. The primary seasonal peak in both credit granted and outstandings occurs in December, with a secondary peak in October for credit granted and in May or June for outstandings. The trough for both is usually in July or August.

Department store outstandings and volume of credit granted are greatest in the same month, whereas the automobile outstandings peak lagged two or three months behind the seasonal peak of credit granted. In December, department store credit granted considerably exceeds the volume of repayments, so that outstanding debt increases sharply; but in January credit grants drop very sharply below repayments, so that outstanding debt decreases. Automobile instalment sales, on the other hand, are heaviest in three or four

[7] This is because repayments during any one month result from operations during several preceding months, usually 12 to 18.

Chart IV

MONTHLY TOTALS OF INSTALMENT CREDIT GRANTED, REPAYMENTS AND OUTSTANDINGS[a] FOR FIVE TYPES OF RETAIL ESTABLISHMENTS AND FOR THE FIVE TYPES COMBINED



consecutive months (March to June), but they rise and fall at a moderate rate; so that for several months after the sales peak occurs the volume of credit granted continues to exceed repayments, and outstandings continue to rise.

Furniture Stores

Furniture store instalment credit sales were greatest in 1929, when almost $691,000,000 worth of instalment credit was extended to consumers. During the same year average outstandings, totaling $541,900,000, and repayments, amounting to $659,000,000, were likewise at their highest figures. As in the automobile and department store series, the lowest point for credit granted was reached in 1932, when it was 66 percent below 1929, for average outstandings and repayments in 1933, when these items were 46 and 57 percent respectively below 1929. Unlike the two series already discussed, however, the volume of furniture store sales never again approached its 1929 peak, and since the average duration of indebtedness was about the same in 1937 as in 1929, the volume of outstandings as well as of credit granted and repayments remained approximately 30 percent below the 1929 levels. The sharpest change in outstandings during any one year was the decrease of $140,600,000 in 1932.

Monthly figures for furniture stores reveal seasonal movements very much like those which characterize the department store series (Chart IV–C). December is the peak month for credit granted and outstandings. Smaller seasonal peaks are registered for both items in October and in the spring months. The low month for the amount of credit granted is January; for outstandings it is February or March.

Household Appliance Stores

Credit granted and repayments were high in 1929, with volumes of $466,800,000 and $417,400,000 respectively, but average outstandings were highest in 1937, totaling $255,900,000. Although credit granted and repayments fell approximately 40 percent from 1929 to 1937, average outstandings rose 6 percent, as a result of a trend toward increasing the length of instalment contracts on household appliances. Credit granted fell 68 percent from 1929 to 1932, reaching a low point of $149,200,000 in the latter year. Repayments and outstandings decreased through 1933, when the volume of repayments was $156,400,000 and of outstandings $113,900,000. These figures represent decreases from 1929 of 63 percent in repayments and 53 percent in average outstandings. The greatest changes in outstandings occurred in 1932, when they decreased by about $63,000,000, and in 1936, when they rose by $67,000,000.

In spite of the fact that the number of appliances sold on an instalment basis increased greatly between 1929 and 1937, credit extensions by household appliance stores amounted to less in 1937 than in 1929. Most of this decrease may be traced to two factors. First, appliances became much less expensive. The tremendous decline in household appliance retail prices over the last ten years is well illustrated by data from a trade journal, which show that in 1938 the average retail price of electric refrigerators was 41 percent lower than in 1929, of washing machines 36 percent lower, and of electric ranges 19 percent. Radio prices declined 60 percent from 1929 through 1937. Vacuum cleaners were the one exception to this trend, increasing in price by 19 percent from 1929 to 1938.[8] Second, household appliances were being distributed through department stores, drugstores, furniture stores, hardware stores, mail order houses, and many other retail outlets besides appliance stores.

The primary seasonal peak in credit granted usually occurred in May or June, after a heavy concentration of sales for several months (see Chart IV–D). A secondary peak was also registered during December. The peak in outstandings lagged by one to three months behind that for credit granted, developing usually in July or August. January seems to have been the trough month for credit granted, and February or March for outstanding debt.

Jewelry Stores

Of the five types of retail establishments covered in this study, the jewelry store group transacted the smallest volume of instalment business. Credit extended to consumers by jewelry stores was greatest in 1929, totaling $88,800,000, and almost as large in 1937, when it totaled $84,600,000. Average outstandings in each of these years came to approximately $47,000,000. Credit granted, repayments, and average outstandings were lowest in 1933, when these items had decreased 64 percent, 61 percent, and 48 percent respectively from their 1929 levels. The greatest net change in end-of-year outstandings during one year was a $15,600,000 decrease in 1932.

The monthly estimates for jewelry stores show striking seasonal changes (Chart IV–E). Extensions of instalment credit reach a tremendous seasonal peak in December; at least one-third of the annual instalment transactions of jewelry stores are made in that month, causing a sharp peak in outstandings as well.

[8] *Electrical Merchandising*, Statistical and Marketing Issue, January 1939.

"All Other Stores"

The "all other stores" classification included many retail apparel and accessory outlets whose sales did not vary as much as those of most concerns selling on an instalment basis.[9] The volume of credit granted was at its peak in 1929, when it amounted to $296,600,000. Repayments were highest in 1930, totaling $276,700,000, and average outstandings in 1938, when they reached $195,000,000.

As with the other groups in our series, credit granted was lowest in 1932 when the volume stood at $153,500,000; but 1933 marks the low point both for repayments ($152,800,000) and for outstandings ($116,500,000). These three figures represent decreases of 48 percent, 44 percent, and 33 percent respectively from the 1929 figures.

No figures were available for monthly estimates for stores in this classification.

Monthly Totals for the Five Principal Retail Credit Establishments Combined

For the five major retail establishments combined, the heaviest concentration of credit granted occurred during the spring months (Chart IV–F), with another rise during December. Because automobile debt constitutes approximately one-half of total retail debt, the seasonal pattern in total credit granted is quite similar to that of the automobile series. Outstandings reached modified seasonal peaks during the summer months and in December.

Estimates of Cash Loan Instalment Credit

During the ten-year period covered by our estimates, total cash loan average outstandings[10] were at their highest point in 1938, when they averaged $1,124,900,000, or more than 100 percent above their 1929 level; they were lowest during the two years 1933 and 1934, when they approximated $460,000,000. This is in contrast to retail instalment debt, which rose in 1934 and declined in 1938.

The volume of credit extended to consumers by the four principal cash-lending agencies[11] was likewise at a peak during 1938, totaling $1,575,600,000. Repayments reached a high in the same year with a volume of $1,516,800,000.[12] The low year for both credit granted and repayments was 1933, when these items totaled $584,300,000 and $633,100,000 respectively; they then began to rise, increasing approximately 170 percent and 140 percent respectively by 1938 to volumes 60 percent and 76 percent above 1929.

End-of-month outstandings for the four principal types of lending institutions and for FHA loans are shown combined and singly in Chart V. Total outstandings increased in 1929 and 1930, decreased gradually until the end of February 1934, and again moved upward; from March 1934 to the close of 1938 they increased 167 percent, and were still rising at the close of December 1938, the last month to which our estimates apply.

A marked cyclical movement is exhibited by the personal finance company and the industrial banking company curves shown in Chart V. Personal finance company outstandings rose steadily from 1929 until January 1931, and declined gradually to a low point at the end of October 1933. From this date to the close of 1937, the loan balances of these companies increased 54 percent. Industrial banking company outstandings fluctuated more, dropping 48 percent from the end of the expansion period 1929–30 to February 1934, and rising almost 100 percent by the end of 1938.

The commercial bank and credit union curves in Chart V move in the same way cyclically as the personal finance company and industrial banking company curves during 1932–33, but show a tremendous secular growth in the period 1934–38. Consumer loan balances of these agencies showed decreases of 36 percent and 21 percent respectively during 1931–33. During 1934–38, however, indebtedness to credit unions multiplied more than four times, and to commercial banks more than eight times.

Insured FHA (Title I) loans were first made in 1934.

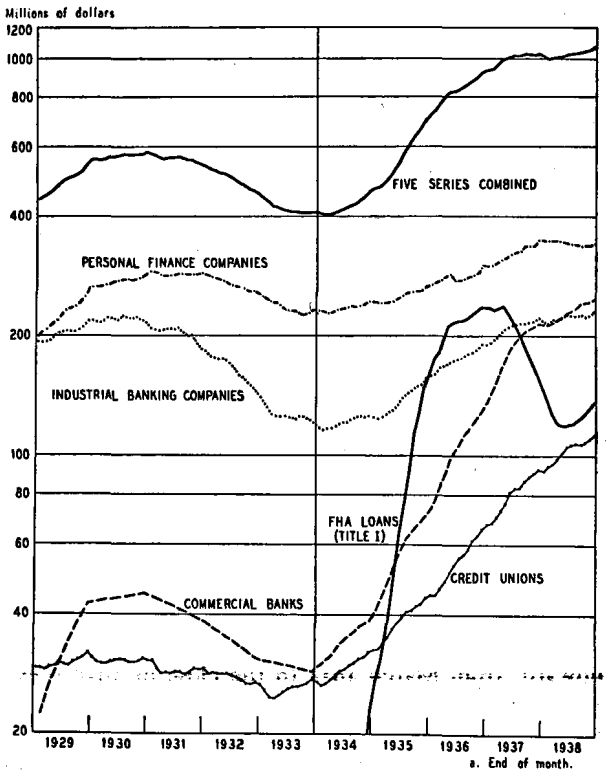
[9] These establishments are as follows: country general stores, drygoods and general merchandise stores, gasoline filling stations, garages, automobile tire and accessory stores and other automotive stores, the entire apparel group, hardware stores, bookstores, sporting goods stores, florists, secondhand stores, drugstores, bicycle shops, fuel and ice dealers, gift, novelty and souvenir shops, and luggage stores.

[10] These figures include commercial banks, credit unions, industrial banking companies, personal finance companies, and unregulated lenders; as well as insured FHA (Title I) loans of $2,000 or less.

[11] Commercial banks, credit unions, industrial banking companies, and personal finance companies. Unregulated lenders and FHA loans are excluded. The estimates of credit granted by cash-lending agencies include renewals of loans (old balances renewed). If an outstanding loan for $50 is renewed, $50 is added to payments due in that month and $50 to loans made. The result is an increase in both loans made and payments due; outstandings, however, remain the same.

[12] Estimates of repayments to cash-lending agencies include accounting collections on old balances renewed.

Chart V
MONTHLY TOTALS OF INSTALMENT LOAN OUTSTANDINGS[a] FOR FOUR TYPES OF CASH LENDING INSTITUTIONS, FOR FHA LOANS, AND FOR THE FIVE SERIES COMBINED 1929–1938



Average outstandings were highest during 1936, when they amounted to 24 percent of total outstandings of all cash-lending institutions combined. These loans were discontinued, however, during most of 1937, with the result that in 1938 outstandings were only 11 percent of the total.

During 1929–38 personal finance companies held a decreasing proportion of the total loan balances of all lending institutions, and in this same period average outstandings for industrial banking companies also declined in relation to other lending agencies; the share of the former dropped from 42 to 31 percent in the ten-year period, and that of the latter was almost cut in half (40 percent to 20 percent). These decreases reflect the rapid growth of commercial banks and credit unions in the cash loan field; in 1929 only 11 percent of total cash loan indebtedness arose from these two types of institution, but in 1938 they were responsible for almost 30 percent. It does not follow, however, that the loan balances of personal finance companies and industrial banking companies fell off during this period; the cash loan group as a whole more than doubled its volume of business during the ten-year period, and within the group the outstandings of personal finance companies rose 50 percent and that of industrial banking companies 10 percent. The share of total average outstandings held by unregulated lenders changed little during this period, remaining close to 8.5 percent.

INDIVIDUAL CASH LOAN SERIES

Commercial Banks

Credit extended to consumers through personal loan departments of commercial banks was greatest in 1938, when it totaled $374,900,000. Repayments, amounting to $341,900,000, and average outstandings, totaling $228,500,000, were also highest in that year. Volume of repayments touched the low point in 1929 and volume of loans made in 1933, but average outstandings were low ($30,000,000) in both these years. The year 1937 witnessed the greatest change in outstandings, a net increase of $84,800,000.

In connection with this great rise in loan volume between 1933 and 1938, it should be remembered that the number of personal loan departments in commercial banks grew rapidly in that period. Of 1,095 banks reporting personal loan departments to the National Bureau of Economic Research in 1938, 80 percent had established these departments after 1932.[13]

Monthly estimates for commercial banks (Chart VI-A) do not show the distinct seasonal patterns which appear in the retail series. Outstandings changed very little during the period, but the volume of loans made shows a December seasonal peak, and a secondary peak in June. The repayments curve moves in very much the same direction as the credit granted curve.[14]

Credit Unions

Credit unions are quantitatively the least important of the four principal types of lending institutions. Total average outstandings of credit unions were highest in 1938, when they amounted to $102,600,000. Loans made and repayments were also highest in 1938, totaling $179,400,000 and $159,200,000 respectively in that year.

These three credit items were at a low point in 1933, when loans made came to $32,500,000, repayments to $32,000,000, and average outstandings to $25,900,000. The greatest change in loan balances occurred in 1937, when outstandings rose by $26,800,000. At the close of

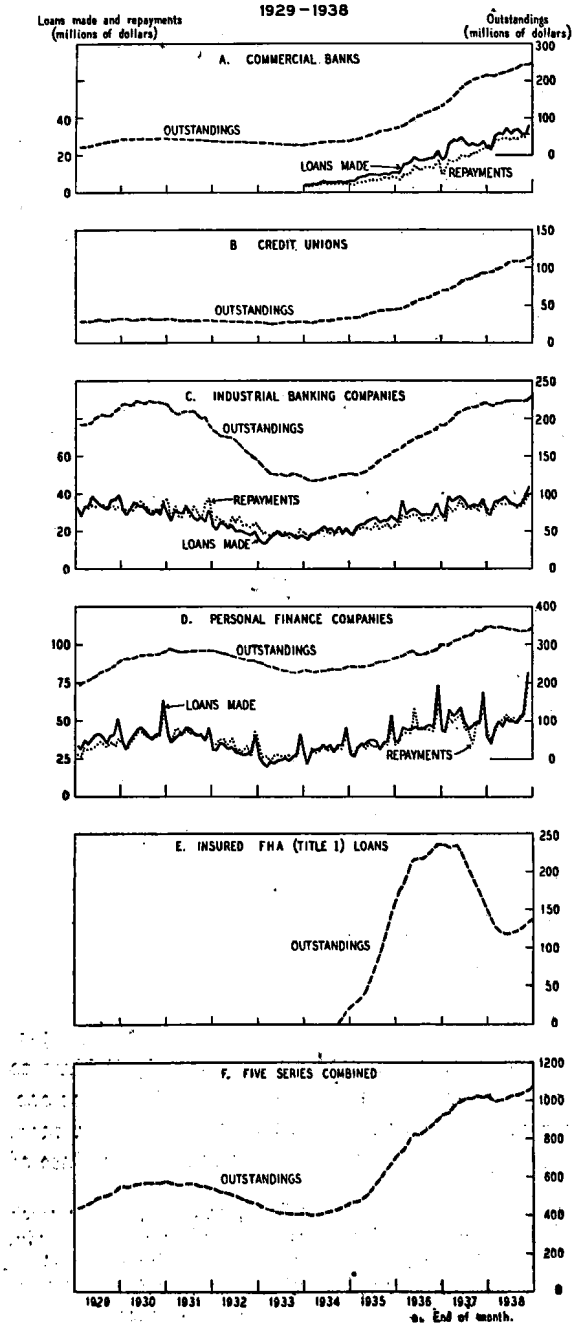
[13] National Bureau of Economic Research (Financial Research Program), *Commercial Banks and Consumer Instalment Credit*, by John M. Chapman and Associates (1940), Table 1, p. 28.
[14] This is because accounting collections on old balances renewed were included in the total repayments figures.

1938 average outstandings were 242 percent higher than they had been in 1929.

Monthly figures for credit union outstandings reveal no discernible seasonal pattern (Chart VI–B). Monthly data covering loans made and repayments for these institutions are not available.

Chart VI

MONTHLY TOTALS OF INSTALMENT LOANS MADE, REPAYMENTS AND OUTSTANDINGS[a] FOR FOUR TYPES OF CASH LENDING INSTITUTIONS, FOR FHA LOANS, AND FOR THE FIVE SERIES COMBINED 1929–1938



Industrial Banking Companies

Unlike the commercial bank and credit union figures, the industrial banking company series show no evidences of growth trend. Loans made by industrial banking companies during the ten-year period reached a peak of $416,900,000 in 1938, and repayments, amounting to $407,500,000, were likewise at their high point in that year. Both these items showed relatively little change from the pre-depression high points of 1929. Average outstandings were at almost the same high points in 1930 and 1938 ($220,100,000 and $222,800,000 respectively).

Loans made and repayments declined gradually from 1929 through 1933, when they reached $201,600,000 and $224,000,000 respectively. Average outstandings fell to $120,500,000 by the end of 1934, and the greatest change in this item took place during 1932, when there was a $41,300,000 net decrease.

Credit granted and repayments, by months, for industrial banking companies do not show any pronounced seasonal movement, although they tend to rise in December, and some slight concentration of loans made appears during the spring months (Chart VI–C). For both items the seasonal low occurs in January and February. The outstandings curve shows no distinct seasonal pattern.

Personal Finance Companies

The volume of instalment credit extended to consumers by personal finance companies reached its high point ($615,300,000) in 1937, and was almost as high in 1938 ($604,400,000). Repayments and average outstandings were highest in 1938 ($608,200,000 and $347,600,000 respectively). Loans made and repayments were lowest in 1933, and average outstandings remained at a low point (approximately $236,000,000) during the two years 1933 and 1934. A rise of $70,000,000 during 1929 constituted the greatest change in outstandings over the ten-year period.

In general, the series for personal finance companies are more stable than those for other institutions in the cash loan group; compared to other lending institutions their loan balances declined little during 1932–34 and increased slowly during the 1935–38 period of expansion.

Monthly figures on personal finance companies show that for loans made and repayments there are pronounced seasonal peaks in December and troughs in January or February (Chart VI–D). Month-end outstandings likewise come to a slight peak in December.

It is interesting to note that in June 1936 personal finance outstandings showed a sudden decrease of 4 percent, due to repayments made after the distribution of the Veterans' Bonus.

Unregulated Lenders

Figures on unregulated lenders have been included in order to complete the instalment credit totals for all types of cash-lending agencies, but these estimates are for annual outstandings and net credit change only. Average outstandings for such institutions were highest during 1938 ($96,100,000), lowest in 1933 ($38,600,000). The greatest net credit change was an increase of $19,500,000 in 1936.

Insured FHA (Title I) Loans

Average outstandings on FHA (Title I) loans of $2,000 or less reached a high point of $211,100,000 during 1936. The greatest change in actual outstandings took place in 1935, when this item increased by $140,200,000. Actual month-end outstandings reached a peak point of $237,100,000 in November 1936 (Chart VI–E). Monthly data covering loans made and repayments for FHA loans are not available.

Estimates of Retail and Cash Loan Instalment Credit Combined

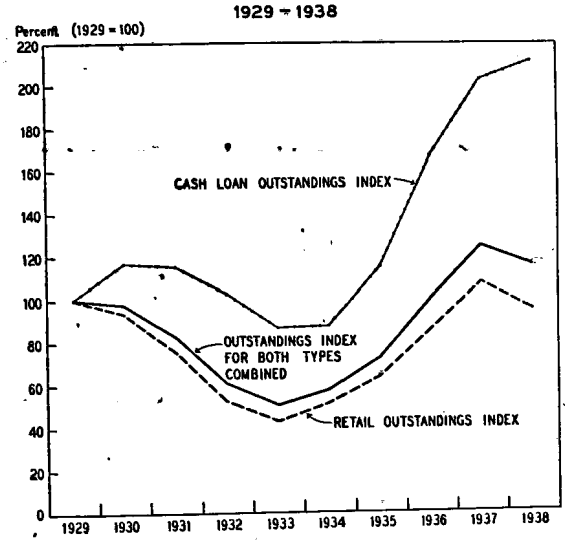
Total average instalment indebtedness was $3,719,800,000 in 1937, the high point of the ten years covered by this study.[15] The low point was 1933, when indebtedness totaled $1,511,200,000. Both in 1937 and 1938 the amount of instalment indebtedness was larger than in 1929, when it was approximately $3,000,000,000.

Indebtedness arising from retail instalment transactions accounted for approximately 75 percent of all instalment debt during the 1929–38 period as a whole, but its relative importance fell from 82 percent of the total in 1929 to 67.5 percent in 1938. Cash loan debt makes up a larger proportion of total instalment debt during recession years than during times of business revival, retail debt decreasing sharply during periods of recession. In the revival years after 1933, however, cash loan debt accounted for a substantially larger proportion of total debt than it did in 1929; for example, in 1937 it made up 29 percent of total instalment debt, compared to 17.7 percent in 1929.

The trends shown by cash loan instalment debt differ from those shown by retail instalment debt. In 1938 the average amount of cash loan debt was more than twice as great as it had been in 1929, while retail debt was 5 percent lower. Cash loan debt as a whole showed a slight increase in 1930, but retail instalment debt dropped sharply in the latter year. Retail debt rose during 1934 and declined during 1938, while cash loan outstandings were lowest in 1933–34 and at their highest point in 1938.

Total indebtedness followed a direction generally similar to that of retail indebtedness. This is to be expected, since retail instalment debt made up approximately three-fourths of total consumer instalment debt during the period covered. According to Chart VII, which shows the indices of average outstandings for the retail, cash loan, and composite groups,[16] from 1929 to 1933 the composite index declined about 50 percent and the retail index about 60 percent, while the cash loan index decreased 15 percent. After 1933 total indebtedness rose to a new high in 1937, when it was almost 24 percent above its 1929 amount. Retail indebtedness in 1937 was 7 percent over its 1929 volume, and cash loan indebtedness was 103 percent higher; but in 1938 total indebtedness and retail indebtedness fell off, while cash loan debt continued to rise. This steady increase in cash loan debt was occasioned by a striking growth in the loan business of commercial banks and credit unions.

Chart VII
INDICES OF AVERAGE ANNUAL INSTALMENT OUTSTANDINGS FOR ALL TYPES OF RETAIL ESTABLISHMENTS AND CASH LENDING INSTITUTIONS
1929 – 1938



[15] Totals include the six types of retail establishments, and all types of cash loans including the series of insured FHA (Title I) loans.

[16] Including all types of agencies, both retail and cash loan, and insured FHA (Title I) loans.

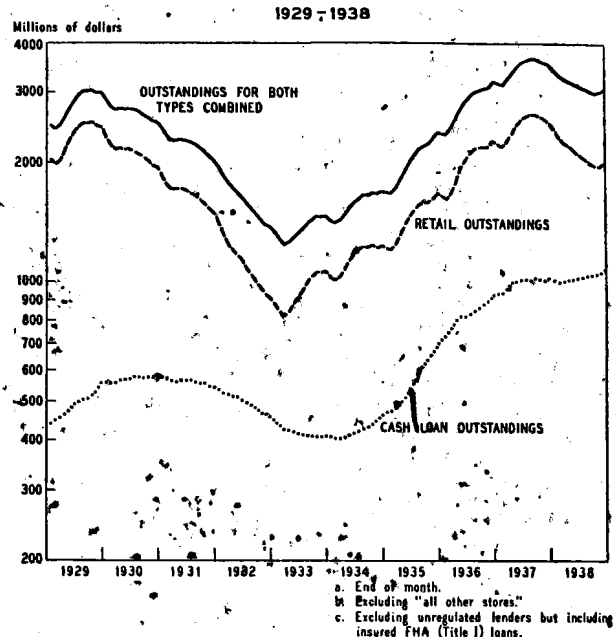
Instalment debt arising from automobile purchases accounted for 25 to 42 percent of total instalment debt during 1929–38. Furniture stores were responsible, on the average, for about 16 percent of total debt during the period, and personal finance companies for 11 percent. The proportion of total outstandings held by commercial banks and credit unions combined was 6.9 percent in 1937, whereas it had been only 2 percent in 1929.

The total volume of credit granted by the major credit agencies in both groups[17] reached its peak in 1929 at $5,282,000,000, and in 1937 it was almost as high ($5,145,000,000). Repayments were high in 1929 ($4,802,000,000) and rose further in 1930, to their peak of $4,821,000,000. Outstandings showed a marked decrease in 1932, when repayments exceeded credit granted by $711,000,000; but in 1936 they increased by $773,000,000, the greatest net change in outstandings during the period studied.

The monthly movement of outstandings for the principal agencies covered in our estimates[18] appears in Chart VIII. Total outstandings reached a peak at the close of September 1937, having risen 15 percent above the previous peak point (October 1929) and 195 percent above March 1933, the low point of the ten-year period. Between October 1929 and March 1933 total outstandings fell 59 percent. The peak in total instalment debt which occurred at the end of September 1937 was 15 percent above the previous peak point in October 1929. Retail outstandings show some seasonal movement, rising in the spring months and again in December; but cash loan outstandings show practically no seasonal pattern. Outstandings for both types of credit combined show a slight seasonal movement which follows, as would be expected, the pattern of retail outstandings.

Chart VIII

MONTHLY TOTALS OF INSTALMENT OUTSTANDINGS[a] FOR THE PRINCIPAL TYPES OF RETAIL ESTABLISHMENTS[b] AND CASH-LENDING INSTITUTIONS[c]
1929–1938



a. End of month.
b. Excluding "all other stores."
c. Excluding unregulated lenders but including insured FHA (Title I) loans.

INSTALMENT CREDIT IN RELATION TO INCOME PAYMENTS

According to the evidence assembled in the consumer instalment financing studies of the National Bureau, the vast bulk of consumer instalment credit is extended to individuals whose annual incomes do not exceed $5,000. A comparison of the present instalment credit series with estimates of total income payments received by these individual consumers from 1929–38 shows that an average of approximately 9 percent was added to their total purchasing power by instalment credit, while repayments of such credit absorbed on the average a similar proportion of their total income. At the bottom of the 1929–37 business swing (1932), instalment credit granted amounted to only 6 percent of the aggregate income of the consumers using it, but at the top of the swing (1937) it amounted to 11 percent. Repayments, lagging cyclically behind credit granted, reached a low in 1933 of 6.4 percent of the aggregate incomes of consumers using instalment credit, and a peak of 11 percent in 1938.

In years of business advance, instalment credit granted consistently exceeded repayments of instalment debt, giving rise to a net addition to the stream of consumer purchasing power. In each year of business contraction, a net drain on consumer purchasing power was created. The maximum net addition to purchasing power during this ten-year period occurred in 1936, and the largest net drain in 1932. In both years, however, the amount involved was relatively small, roughly 2 percent of the total income of consumers receiving annual incomes of $5,000 and less. The economic significance of consumer instalment credit, however, is not to be judged solely by its quantitative amount relative to total income payments.

[17] Including the six types of retail establishments; excluding unregulated lenders and insured FHA (Title I) loans from the cash loan group.

[18] Excluding "all other stores" from the retail group, and unregulated lenders from the cash loan group.

National Bureau of Economic Research

BULLETIN 58

NOVEMBER 15, 1935

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

X:20y74.73.N4
G5
20

Production in Depression and Recovery

Copyright 1935, National Bureau of Economic Research, Inc.

CHARLES A. BLISS

DURING periods of rapid economic change special significance attaches to measures of the physical volume of production. Here, in relatively unequivocal terms, are summaries of the accomplishments of an economy in providing the material goods that contribute to the national income. Other information is useful, but is often obscured by confusing shifts in prices. The output of physical goods of course reveals but one aspect of the functioning of the economy; for example, the figures give little indication of the changes in conditions under which the goods were produced. Moreover, the contributions of service occupations are inadequately represented. But in a wide realm of the nation's productive life, the record of the physical volume of output provides the best single index of economic activity.

Measurements presented in this *Bulletin* indicate the extent of decline and recovery in domestic and world output; they also suggest the changes that have taken place in the character of production, indicating where activity has been most pronounced, where it has been most depressed. In addition, changes in production volume are shown in relation to changes in the total population and in the number of workers employed. We first compare fluctuations of production volume in the United States and in the other major countries of the world.

I. WORLD RECESSION AND WORLD RECOVERY

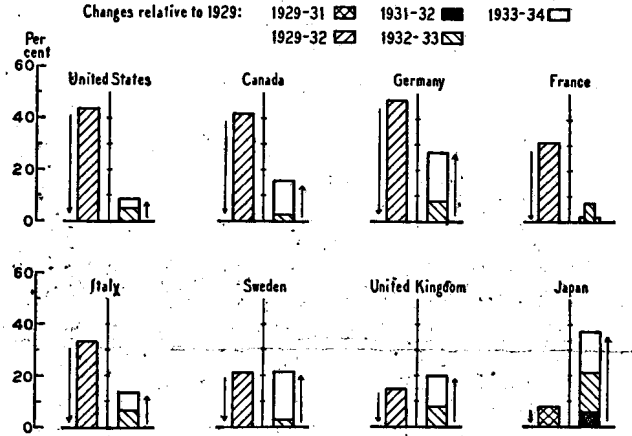
In 1934 recovery in the physical volume of world production continued. Although basic commodities did not increase in output, those used as industrial raw materials did advance some 6 per cent, reaching a level 16 per cent above the output of 1932. Partially offsetting this increase, there was a decline of 2 per cent in the world's output of crude foodstuffs. Greater recovery has occurred in purely industrial activity (mining, manufacturing and, in most countries, construction). World output in these lines in 1934 was roughly 10 per cent greater than in 1933 and 24 per cent above 1932. That the improvement has continued into the present year is indicated by monthly esti-

CHART 1

DECLINE AND RECOVERY

INDUSTRIAL PRODUCTION IN EIGHT COUNTRIES

1929=100



The column on the left of each diagram represents the depression decline; the column to the right shows the progress made during each year of recovery towards offsetting that decline. Recovery in France has been set back by the 1934 decline.

mates. The rate of industrial output in the last month for which figures are available (July 1935) is the same as the rate for March 1930, and is not much below the 1929 high. The percentage decline from the peak month to the low point and the subsequent increase are tabulated below, together with similar figures for the United States.[1] The greater severity of the decline in this country, and the smaller degree of recovery, are clearly evident.

	DEPRESSION DECLINE IN RATE OF INDUSTRIAL PRODUCTION (*per cent*)	RECOVERY TO JULY 1935 AS PERCENTAGE OF PEAK ACTIVITY	PERCENTAGE BELOW PEAK ACTIVITY, JULY 1935
World	—35	+30	—5
United States	—56	+27	—29

[1] The index of world industrial production, computed by the Institut für Konjunkturforschung of Berlin, is based upon available national indexes of industrial production. The annual index

The above tabulation is supplemented by Chart 1, which shows the relative amounts of decline and recovery in the physical volume of industrial production in eight selected countries. The first column of each diagram represents the depression decline in the annual output of the country to which the diagram refers; the second column records the recovery through the year 1934. In but three instances is the recovery equivalent to recession. In the United Kingdom, industrial output for 1934 (including construction) was slightly greater than that of the relatively modest high point registered in 1929. Records for Sweden also indicate that the pre-recession volume of production has been matched. In Japan the rate of industrialization has been progressing so rapidly that an absolute increase over the pre-recession level appears. In France alone of the eight countries here represented did the volume of output fail to increase during 1934. The increase in the United States, while substantial when the extent of its industrial activity is considered, was still much less than that indicated for the other major countries of the world. A more precise picture of the change may be had by comparing the industrial records for different countries in greater detail. This is done in Chart 2.

Two facts stand out clearly: First is the failure of the textile industries in the United States, France and Italy to maintain, in 1934, the increases in output that marked the recovery of 1933. In the other five countries the textile industries forged ahead steadily, and in all but the United Kingdom their output exceeded the levels of 1929. The second significant feature of Chart 2 is the wide fluctuation in the output of the heavy industries, represented by the output of steel and the volume of building activity. A disproportionate influence in measures of industrial activity may frequently be given to the iron and steel industry because of the ready availability of records of its physical output. Yet the great fluctuations in steel output, together with those in building, account for much of the movement in the volume of aggregate production. Activity in these industries has been a major factor in swelling the volume of production in those countries where recovery has surpassed that of the United States. In this country there has been a small but continued rise in steel output, and in 1934 an encouraging increase in construction volume.

THE SHARE OF THE UNITED STATES IN WORLD PRODUCTION AND WORLD TRADE

Available measures of production volume indicate that recovery in the United States has lagged behind the gains of certain other industrial countries. A factor contributing to the sluggishness of American recovery is to be found in the relatively reduced foreign sales of American products. The materials here presented bear upon this second feature of the recession and recovery periods.

In certain countries, notably England, a high rate of construction activity is a large factor of recovery in production. The comparison, therefore, of the recovery movements in the United States and in other countries tends to overstate the relative loss of this country in the production of the movable goods that enter into world trade. However, the ratios of domestic to world output of selected commodities given in Table 1 do indicate for 1934 a much less important role for the United States than in 1929. These ratios reflect, of course, a temporary displacement that will tend to be corrected as activity in this country gains headway. They also reflect an indeterminate, and possibly permanent, shift caused by the increasing diversification of productive endeavor in other countries.

TABLE 1

THE SHARE OF THE UNITED STATES IN WORLD OUTPUT OF SELECTED COMMODITIES, 1929 AND 1934

COMMODITY	RATIO OF DOMESTIC TO WORLD OUTPUT (*in percentages*)		1934 RATIO AS A PERCENTAGE OF 1929 RATIO
	1929	*1934*	
Copper	52.3	18.8	36
Oats	23.7	13.2	56
Wheat[1]	19.1	10.9	57
Cement	39.0	23.6	61
Silver	23.0	14.5	63
Steel	47.5	32.2	68
Maize (corn)	56.3	38.1	68
Cotton	55.9	41.0	73
Coal	41.4	34.2	83
Artificial silk[1]	27.8	23.1	83
Motor cars	84.8	74.2	88
Tobacco	30.2	26.7	88
Petroleum[1]	67.1	59.6	89
Woodpulp	25.8	23.0	89
Gold[1]	11.0	11.8	107
Sugar beets[1]	10.8	12.0	111

[1]Commodities the world output of which increased between 1929 and 1934.

---

numbers of the output of basic commodities given in the text are computed by the Economic Intelligence Service of the League of Nations. The measures for the United States are based on the annual indexes of mining, manufacturing and construction of Table 3 and various data on monthly changes. The world index utilizes a somewhat different index for the United States but tests indicate that the substitution of the present series would not appreciably alter the above comparison.

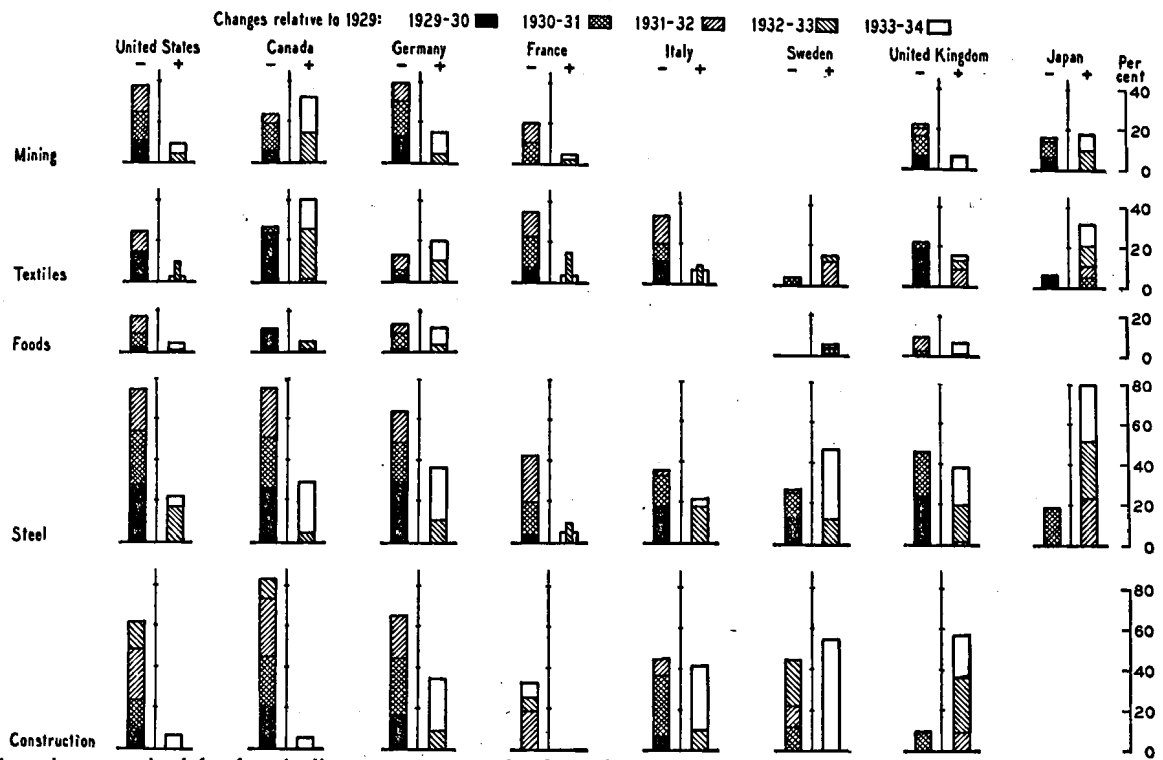
The world figures presented above include the output of the U.S.S.R. Annual figures excluding this country make possible the following comparison (all figures are on a 1929 base). The general picture shown by these annual averages is much the same as that given by the more widely fluctuating monthly figures. World output during the first seven months of 1935 was three per cent below the 1929 level; output in this country was 27 per cent below 1929 (108 and 82 on 1927 as 100, respectively).

	DECLINE 1929-32	RECOVERY 1932-34	PERCENTAGE BELOW 1929 IN 1934
World, including U.S.S.R.	—29	+17	—12
World, excluding U.S.S.R.	—34	+16	—18
United States	—44	+ 9	—35

CHART 2

DECLINE AND RECOVERY IN FIVE INDUSTRIAL DIVISIONS - EIGHT COUNTRIES

1929=100



The column on the left of each diagram represents the depression decline; the column on the right shows the progress made during each year of recovery towards offsetting that decline.

Evidence bearing on the decline in the relative position of the United States in world output is given in Table 2, which summarizes changes in the export-import relationships of the United States with various regions of the world. The measures suggest that while the diminished percentage of world output suffered by the United States may in part be due to nationalistic efforts towards economic self-sufficiency, it is also due to the loss to other nations of competitive foreign markets and the resulting smaller share for this country in the current volume of world trade. Of the goods imported into all other countries in 1929, 16.8 per cent were from the United States; in 1934 this percentage had fallen to 11.5. When trade with particular regions is examined, this general decline appears to be almost universal. Only in the imports of Asia has the share of the United States in foreign trade been maintained anywhere near the levels of 1929. Some recovery in 1934 is to be noted in our relative export position, except in our trade with Europe; in its foreign purchases our share continued to decline.

These general relationships, of course, hide much that is important for an understanding of the trade position of the United States. The decline in the world's takings of American cotton, to cite a single commodity, has influenced these ratios profoundly. Moreover the shifts in the character of world trade under the peculiar influences of the depression should be considered. The diminished share in world imports is in some measure a cyclical phenomenon and a consequence of the severe depression and tardy recovery in this country. So also, of course, is the reduced percentage of foreign exports shipped to American ports. In 1929 the United States took 15.8 per cent of foreign exports; in 1932 this percentage had fallen to 11.7, and by 1934 to 9.8. The departure of the dollar from the gold standard and its devaluation in terms of foreign currencies has tended, since early 1933, to discourage the purchase of the products of other countries.

II. CHANGES IN THE TOTAL VOLUME OF PRODUCTION IN THE UNITED STATES

The measurements presented in the preceding section have touched on various aspects of productive activity in the United States. To obtain some notion of the change in the aggregate, we now bring together estimates of the volume of production in all lines. This composite of productive activity measures the commodity income of the nation.[2] The shrinkage of the annual product during the

[2] To the extent that a portion of this annual product must go towards the replacement of capital, the measure is one of gross rather than net income.

TABLE 2

THE SHARE OF THE UNITED STATES IN WORLD TRADE, 1929-1934[1]

	1929	*1932*	*1933*	*1934*
Imports from the United States as a percentage of total imports	AMERICAN EXPORT TRADE			
Europe	11.8	9.2	8.8	7.9
North America (excluding U.S.)	64.8	53.2	48.1	49.6
Asia	13.8	15.4	13.2	14.0
South America	28.5	20.6	17.2	19.2
Africa	7.7	4.4	4.3	5.9
Oceania	19.8	13.3	10.3	11.9
World (excluding U.S.)	16.8	12.7	11.4	11.5
Exports to the United States as a percentage of total exports	AMERICAN IMPORT TRADE			
Europe	8.3	5.9	6.1	5.2
Asia	26.0	20.5	19.5	16.5
North America (excluding U.S.)	45.0	38.1	32.0	29.6
South America	28.4	24.9	21.3	17.6
Africa	7.3	2.8	2.6	2.6
Oceania	6.4	1.9	2.4	2.4
World (excluding U.S.)	15.8	11.7	10.8	9.8

[1]Since imports from and exports to the United States have been measured as they leave or arrive at American ports, losses in transit and differing methods of valuation affect the ratios somewhat. Before computing the ratios, the basic data were converted into terms of gold dollars.

The regions are listed in order of their importance in the trade of the United States.

recession, and its increase during the last three years are estimated in Table 3. The increase, meanwhile, in the number of claimants to this annual product is indicated by the index of population growth.

Domestic production fell off during the successive years of depression well over one-third, according to the averages of total output. Converted into 1929 dollar values, the difference between 1932 and 1929 output is roughly equal to four times the total exports of 1929; it is greater than the combined 1929 output of all but the twelve most important producing states.* This decline from 1929 to 1932 reduced by 37 per cent the per capita share of the population in the flow of production—the most drastic reduction in the output of this country of which we have record. Following such a drop in the volume of production, the increases since 1932 leave us with much still to be gained before we approach pre-recession levels. Progress in that direction was made by the increase of 7 per cent in 1933 and 1934, and by the further gain of 6 per cent indicated for the first eight months of 1935. Progress has been difficult since in many instances it has been accompanied by adjustments in the areas of productive activity, of which those sponsored by the AAA in agricultural production represent one type. The decline in the output of farm products since 1932 has served to keep the general average down.

Agriculture

The peculiar circumstances that caused an increase in the volume of farm produce at a time when all other forms of production were declining, and the deliberate steps taken under government sponsorship to regulate output and increase total farm income, are well known. These influences govern the movement of the general agricultural index in Table 3. The wide scope of farm activity, and the varying changes in the components of the aggregate are better described by the divisions of the total shown in Table 4.

In only two of the major divisions, grains and cotton, has there been any drastic reduction in output during the depression. The production of fruits and vegetables, including truck crops, has been above the 1929 level through-

*According to estimates based on data of the Bureau of the Census and the Department of Agriculture for different productive activities. The twelve states are: New York, Pennsylvania, Illinois, Ohio, California, Michigan, New Jersey, Massachusetts, Texas, Indiana, Wisconsin, Missouri.

TABLE 3

PHYSICAL VOLUME OF PRODUCTION AND POPULATION, UNITED STATES, 1927-1934

(*1927=100*)

YEAR	FARM PRODUCTS	MINERALS	MANUFACTURES	CONSTRUCTION	TOTAL PRODUCTION	POPULATION
1927	100	100	100	100	100	100.0
1928	105	100	108	105	106	101.2
1929	102	109	116	99	110	102.2
1930	102	97	98	90	98	103.1
1931	108	82	83	75	87	103.9
1932	101	68	66	50	71	104.5
1933	98	73	75	38	75	105.2
1934	92	78	80	44	78	105.9
1935 (8 mos.)	(95)	(81)	(90)	(45)	(85)	(106.6)
PERCENTAGES OF 1929						
1929-32	—1	—38	—43	—49	—35	+2.3
1932-33	—3	+ 5	+ 8	—12	+ 4	+0.7
1933-34	—6	+ 5	+ 4	+ 6	+ 3	+0.7
1934-35 (est.)	+3	+ 3	+ 9	+ 1	+ 6	+0.7

SOURCE: See Appendix Note

TABLE 4

AGRICULTURAL PRODUCTION, 1929-1934[1]

(*1929=100*)

YEAR	GRAINS	FRUITS, VEGETABLES, TRUCK CROPS	COTTON AND COTTONSEED	MEAT ANIMALS (SHIPMENTS)	DAIRY AND POULTRY PRODUCTS	TOTAL
1929	100	100	100	100	100	100
1930	91	109	93	100	102	100
1931	96	115	113	106	104	106
1932	91	105	87	105	102	99
1933	66	102	87	107	103	96
1934	44	107	65	114	99	90
1935 (est.)	(66)	(119)	(78)	(78)	(98)	(93)

[1] The figures for years other than 1935 have been compiled by the U. S. Department of Agriculture. Certain subgroups of the Department's index have been combined for purposes of presentation. The 1935 estimates are based on crop reports as of October 1, and on marketings and inspected slaughter for the first eight months of the year.

The increase in the marketings (total slaughter) of meat animals in 1934 accompanied a decline in the number of livestock on farms, in part the result of this increased slaughter, in part due to the loss of animals during the drought. If marketings be reduced by an amount sufficient to offset this loss in inventories, the 1934 index for meat animals becomes 77 and the index of total agricultural production 81 (on 1929 as 100).

out the period. The output of meat animals, as measured in terms of shipments (slaughter), has also been high. The 1934 peak in the slaughter of meat animals, largely the result of distress selling of cattle during the drought, has meant a reduction in breeding stock which will be reflected in lowered production for some time to come (evident in the 1935 estimate). But with crop production in 1934 at the lowest level since 1890[3] the net volume of agricultural production in 1934 was some 6 per cent below that of 1933, and 10 per cent below 1929. Rough estimates of the probable volume of net farm production in 1935 place it at about three per cent above 1934.

Mineral Production

The averages of mineral production indicate that the recovery in manufacturing has carried the output of mines and quarries also to higher levels. Although the minerals index represents chiefly the production of primary raw materials, which might be expected to fluctuate widely, it declined less during the depression period than did the index of manufactured goods. Recovery likewise has been no more rapid. This is because included among minerals are certain products which enjoy a relatively stable and inelastic demand. It is desirable therefore that the general average be supplemented with measures relating to the chief components of the index. The measures reveal two major trends in the output of mineral products. The output of metals and building materials declined with the reduced volume of investment and replacement of plant and equipment, while the widespread character of the demand for fuels accounts for their less drastic decline. The output of coal, however, declined rather sharply during the depression,[4] in part because of the competitive displacement of this fuel by natural gas, petroleum and electricity. Electricity is not here included among mineral products (nor is it included among manufactured goods, as is manufactured gas). The records of the generation of electricity indicate that output declined 15 per cent from 1929 to 1932; by 1934 there had been an increase amounting to 8 per cent of 1929 output.

YEAR	METALS	BUILDING MATERIALS OTHER THAN METALS	COAL AND NATURAL GAS	PETROLEUM
1929	100	100	100	100
1930	80	87	92	89
1931	55	69	77	84
1932	33	50	65	78
1933	35	44	68	90
1934	42	51	75	90

Manufacturing

Of all the divisions of productive activity, the manufacturing industries are of greatest economic importance.[5] The

[3] The production of 12 major crops from 1866 to 1934 has been measured by a new index constructed by the Bureau of Agricultural Economics (*The Agricultural Situation*, January 1935, p. 4). The average for 1934, which is 66.5 in terms of the average of 1910-14 as 100, is below the average for any year since 1890, and on a per capita basis is well below that for any year covered by the index.

[4] Recent changes in the output of individual commodities, including both bituminous and anthracite coal, are described in the Appendix Table.

From the consumers' point of view, account should be taken of technological improvements tending to economize the consumption of coal. Similarly for petroleum, improvements have been made in methods of extracting gasoline, the principal product of petroleum, and other improvements have, in turn, increased the efficiency of gasoline consumption.

[5] The importance of manufacturing industries is shown approximately by the value added by manufacture (i.e. value of product less cost of materials and fuel). In 1927 and 1931, the years used as the reference base in the calculation of the general index of Table 3, value added by manufacture averaged 23.7 billion dollars. Comparable weighting factors for the other elements of the total index are as follows: agriculture, 9.3 billion; minerals,

elements of manufacturing output are analyzed at some length in Section III. Measurements pertaining to individual manufactured products are given in the Appendix Table.

Construction

The association of activity in the construction industry with industrial recovery in many of those countries where the increase in industrial production has been greater than in the United States has already been noted. Particularly has this been true in the United Kingdom, where, it is estimated, some 300,000 dwelling units were built in 1934 in contrast to less than 50,000 in the United States.[5] Partly because of the significant role the construction industry seems to play in recovery movements and partly because of the efforts of the Federal government to swell public construction, records of building volume during the present recovery are of great interest. The estimates presented in Table 3 show an increase in 1934 over the 1933 low, equal to 6 per cent of the 1929 volume—a modest increase when contrasted to the 61 per cent decline of the preceding four years. These percentages relate to the estimated physical volume of total construction. This total is based upon the accompanying series of estimated expenditures in private, public utility and public construction.[7] The effect of rising construction costs since early 1933, as well as their decline through 1932, must be considered when interpreting these unadjusted figures.

YEAR	PRIVATE CONSTRUCTION	PUBLIC UTILITY AND RAILROADS	PUBLIC CONSTRUCTION	TOTAL
		(in billions of dollars)		
1929	4.6	4.1	2.8	11.5
1930	2.9	3.8	3.3	10.0
1931	1.9	2.7	2.9	7.5
1932	.8	1.4	2.1	4.3
1933	.8	1.1	1.5	3.4
1934	.7	1.3	2.4	4.4

Construction projects sponsored by the Public Works Administration exert, of course, considerable influence upon these totals. In 1929 public construction comprised about one-fourth of all construction expenditures, in 1934 they were over half of the total. In absolute terms, the Federal allotments are much too small to raise the aggregate to anywhere near the levels of 1929, even if we exclude utility construction, which includes a considerable expenditure on equipment.[8]

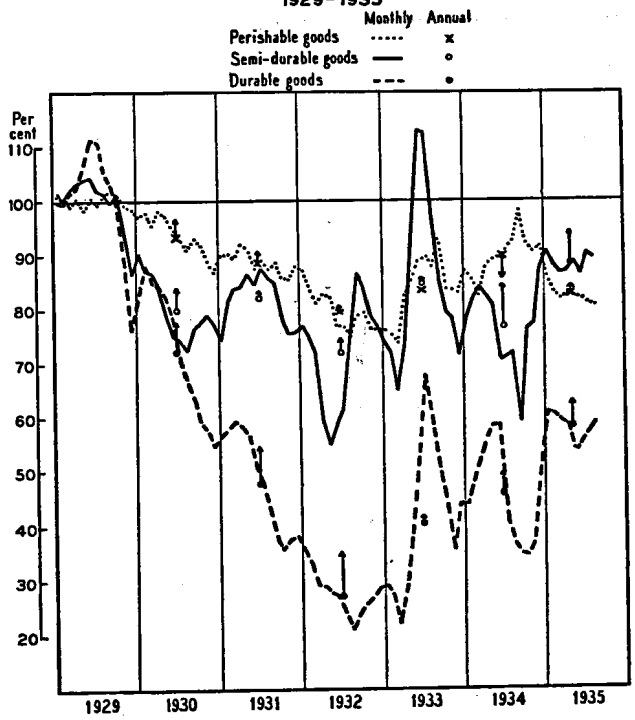
III. COMPONENTS OF MANUFACTURING OUTPUT

The index of total manufacturing production given in the preceding section is a satisfactory measure of the aggregate of manufacturing output. But it by no means represents a homogeneous movement in production volume, as the figures for selected industries given in the Appendix Table testify. Further information about the divisions of the total may be secured by classifying and combining the measures relating to individual commodities. These group index numbers provide the following record of the direction of productive effort during the years of recession and of recent recovery.

Durable and non-durable goods

An important classification of goods is that according to the period of their usefulness. In Table 5 are given

CHART 3
INDEX NUMBERS OF MANUFACTURING OUTPUT
PERISHABLE, SEMI-DURABLE AND DURABLE GOODS
1929–1935



Arrows indicate differences between annual indexes of Table 5 and the annual averages of the monthly series. See Appendix Note.

3.1 billion; construction, 4.8 billion. The full values of raw materials are here taken since there is little direct duplication; in construction total value is reduced one-half as an approximation to value added. The bulk of lumber production is represented in the index of manufactures.

[6] Estimates of the F. W. Dodge Corp., *Building Business,* July 1935, p. 3.

[7] Essentially the same series of estimates is given in some detail through 1932 in *Bulletin 52,* Gross Capital Formation, 1919-1933, p. 17. The present figures, which are rough estimates particularly for the recent years, are taken with permission from a privately circulated research publication. Estimates for the first eight months of 1935 indicate a considerable increase in the volume of private construction, a decline in public construction.

[8] An analysis of the Federal program of public works is included in *Public Works in Prosperity and Depression,* by Arthur D. Gayer, recently published by the National Bureau.

TABLE 5

CHANGES IN THE PHYSICAL VOLUME OF MANUFACTURING PRODUCTION, 1927-1935
ANALYZED ACCORDING TO THREE CLASSIFICATIONS OF COMMODITIES

	1927	1928	1929	1930	1931	1932	1933	1934	1935 (8 mos.)	CHANGES AS PERCENTAGES OF 1929			
										1929-1932	1932-1933	1933-1934	1934-1935
All manufactures	100	108	116	98	83	66	75	80	90	−43	+ 8	+ 4	+ 9
A. Durable goods	100	114	122	95	67	44	52	61	77	−64	+ 7	+ 7	+13
Semi-durable goods	100	102	107	90	90	80	92	91	101	−25	+11	− 1	+ 9
Non-durable goods	100	105	112	108	101	90	93	96	94	−20	+ 3	+ 3	− 2
B. Consumption goods	100	107	115	101	93	80	88	90		−31	+ 7	+ 2	
Capital equipment	100	115	126	96	66	45	52	65		−64	+ 6	+10	
Construction materials	100	104	106	83	59	35	42	46		−67	+ 7	+ 4	
C. Consumption goods													
Durable	100	122	132	105	80	56	66	77		−58	+ 8	+ 8	
Other	100	103	109	100	96	87	94	94		−20	+ 6	0	
Capital equipment and construction materials	100	110	117	90	63	40	47	56		−66	+ 6	+ 8	

index numbers measuring the changes in the manufacturing output of non-durable, semi-durable and durable goods (Classification A). Monthly fluctuations in the output of these types of goods are shown in Chart 3.

Since the replacement of durable goods may be postponed, their production ordinarily will be more seriously curtailed during periods of economic stress than will the production of other goods. Thus during the recent depression the output of durable goods dropped to 36 per cent of the 1929 level—almost three times the decline recorded for other goods. This relatively greater decline is also to be accounted for by the fact that many durable goods are essentially articles of luxury, and therefore satisfy marginal wants, or else are capital goods subject to a sensitive, derived demand. These factors tend to explain as well the greater advance in the output of these goods prior to the depression, an advance which is here shown only for 1927-29. In these two years alone the output of durable goods rose 22 per cent. Other evidence has shown that the rapidly increasing output of durable goods was one of the striking features of the entire post-War decade.[9]

In terms of a pre-recession base, the 1933 improvement was greatest in those industries which produce semi-durable goods. Chief among the products in this group are textiles, the output of which sky-rocketed in the early summer of 1933, largely in anticipation of possible inflation and of expected increases in costs under the codes of fair competition. While the activity that marked these early months of recovery was not continued, the increase was sufficiently great to raise the annual average[10] for the group by 11 per cent of the 1929 level. This is an improvement that compares with increases of 3 and 7 per cent (of 1929 output) in the production of perishable and durable goods respectively. However, the advance in the output of semi-durable goods was not continued into 1934, although the 1935 total will probably show a considerable increase. The rate of output of semi-durable goods during the first eight months is almost equal to that of 1929.

The processing of perishable goods has been one of the most stable of manufacturing activities. Closely allied with the general category of foods, the products in this group lagged in the general increases prior to 1929 and were spared much of the drastic decline that marked the depression. Declining least, this group likewise gained least on the upturn. Our measures place the 1934 level of output 15 to 20 per cent below 1929 per capita output. It is true that certain products formerly enjoyed a large export market, as for example flour; moreover, certain non-processed but increasingly important foodstuffs, such as fruits and vegetables, are not here included.[11] Notwithstanding these qualifications, there can be no return to former living standards until these elementary products are produced in greater volume.

Human consumption goods and capital equipment

Further analysis of the various elements of manufacturing production distinguishes between goods that are destined for use by final consumers and those for use as capital

[9] Cf. *Economic Tendencies in the United States*, by Frederick C. Mills (National Bureau of Economic Research, 1932).

[10] In textiles the averages for the years covered by the Census of Manufactures (1927, 1929, 1931, 1933) have been computed from extensive data on the output of various textile products, but for the intervening years, and for the monthly indexes, the information available relates chiefly to the mill consumption of basic raw materials.

[11] Another group of products not included in the above averages of manufacturing production are liquors and intoxicating beverages, omitted because of the technical difficulties of introducing new series into general index numbers. The increase in their output has been most rapid since the repeal of the Eighteenth Amendment in the summer of 1933. Activity in the industry is

equipment. This is a classification that is difficult to complete, because of the diverse uses of a primary material like lumber or steel or of a finished product like an automobile. Employing available data on the consumption of our manufactured product, and distinguishing building materials as a separate category,[23] we have the index numbers in Table 5 (Classifications B and C).

As would be expected, the production of goods for use as capital equipment declined far more than did the output of consumption goods. Production of building materials suffered similarly, since ultimately they are used in the creation of capital structures. How inadequate the current, curtailed rate of output of capital goods is, we cannot measure precisely. Even though a volume as great as that of 1929 is possibly not now necessary to an ordered and balanced productive structure, there exists a great amount of depreciated and obsolescent machinery which an active economy must soon replace.[24] In addition to expenditures for replacements and repairs new capital investments are necessary to install improvements delayed by the depression; other investments have been made necessary by new trends in consumer demand. These influences should further expand the increased activity in the capital goods industries of which our index numbers give evidence.

The physical output of goods for human consumption provides, in a sense, a measure of the changing welfare of the population. Gauged by such a criterion, consumers' real income, exclusive of services, declined about 30 per cent, 1929-32 (25 per cent, when non-manufactured consumers' goods are included, as in Table 6). Rising in volume 7 per cent of 1929 in 1933 and 2 per cent more in 1934, the level of output of goods destined for human consumption in 1934 remained over 20 per cent below 1929. Since the population increased 3.6 per cent during the same period, the per capita output of manufactured consumption goods in 1934 was almost 25 per cent below that of 1929. As measures of consumer takings, of course, these indexes are qualified by changes in stocks of goods and in foreign trade. Both factors would tend to reduce the extent of depression decline.

The components of the aggregate of consumption goods are marked by interesting and illuminating differences. If we combine certain of the major items in the general index, we can study the movements of four subgroups: foods, clothing, automobiles and related products, and finally, all other manufactured consumption goods. These group indexes are given in Table 6. In addition, measurements of certain consumption goods that require no processing are included. The output of these commodities has been maintained above the 1929 level throughout the period.

indicated by the following figures on production compiled by the Bureau of Internal Revenue.

	FERMENTED MALT LIQUORS (*M bbls.*)	DISTILLED SPIRITS (*M proof gals.*)
1933		
July-December	16,211	17,324
1934		
January-June	21,163	52,723
July-December	21,657	65,987
1935		
January-June	23,297	93,380

A full appraisal of the extent of recovery in manufacturing should take account of this industry, which is about equal in importance to the boot and shoe or cigar and cigarette industries. Significant as is the activity in this industry, it is hardly of sufficient weight to alter materially the general averages presented above.

[23] Also distinguished is the minor group, producers' supplies (fuels, etc.), omitted from Table 5.

[24] The editors of the *American Machinist* estimate that 65 per cent of all metal working equipment is over ten years old and in their opinion obsolete. A similar ratio was found in the study of equipment in industrial power plants by another trade journal, *Power* (*American Machinist*, April 24, 1935, pp. 314-28, 348).

TABLE 6

OUTPUT OF CONSUMPTION GOODS, 1929-1934

	MANUFACTURED CONSUMPTION GOODS						
	FOODS	CLOTHING	AUTOMOTIVE PRODUCTS	OTHER	TOTAL	NON-MANUFACTURED CONSUMPTION GOODS[1]	TOTAL
1929	100	100	100	100	100	100	100
1930	98	87	71	90	88	105	91
1931	92	89	59	74	81	107	86
1932	82	81	45	58	69	103	75
1933	84	93	52	66	76	102	81
1934	86	88	62	70	78	104	83
Change as a percentage of 1929							
1929-32	−18	−19	−55	−42	−31	+3	−25
1932-33	+ 2	+12	+ 7	+ 8	+ 7	−1	+ 6
1933-34	+ 2	− 5	+10	+ 4	+ 2	+2	+ 2

[1] The classification of non-manufactured consumption goods includes all or a part of the following: fruits, vegetables and truck crops; milk; poultry products; fresh fish; anthracite coal; natural gas; electricity.

IV. CHANGES IN OUTPUT PER WORKER AND OUTPUT PER MAN HOUR

One of the interesting depression relationships within the productive structure is that between the volume of goods produced and the amount of labor effort required to produce them. This relationship is usually described by the change in the ratio of production to the number of workers or the number of labor hours. Where there have been frequent and serious shifts in the working hours of employed labor, as during recent years with part-time work and the general introduction of a shorter work week, it is the second ratio which is the more significant. Unfortunately output per man hour is the more difficult to estimate, and the margin of error is accordingly greater. On the basis of available materials, estimates of productivity in manufacturing industries are presented in Table 7.

Combining our estimates of changes since 1929 in the volume of production and employment we secure an index (column 6) of the change in manufacturing output per employed worker. Reflecting the effect of work spreading through part-time employment and a shortened work week, this ratio was almost 10 per cent below 1929 in 1932, and after a slight rise in 1933, fell again in 1934.[14] When it is remembered that to this reduced output of employed workers, many of whom are employed only part time, must be added the annual reductions in output resulting from the idleness of approximately three or four million fully unemployed in manufacturing industries, the current loss to the community is obvious.

The operating efficiency of individual plants is better indicated by the ratios of production to aggregate man hours. These measurements indicate that the output per man hour of employed workers in manufacturing has increased considerably during the depression and has even further increased by relatively small amounts during recovery. While the amount of this increased productivity cannot be measured with absolute precision, there is strong evidence of the upward tendency in the ratio of output to labor effort. Whether the increase is twenty-five per cent or even as low as fifteen per cent,[15] the change indicates an economy of man power at a time when the community could perhaps best afford to spend it. The contrast of this economy of the labor supply in private productive operations to the lavish use of man power in relief employment projects is one of the anomalies of the recovery situation.

These recent increases in output per man hour must not be interpreted as increases in labor efficiency alone. Added requirements made of individual workers have of course operated towards a lower labor cost per unit of output and an increased labor productivity. Other forces, however, and certainly powerful ones, have served to increase the

[14] It is probable that during 1935 the ratio of output per worker will rise, for the reduction of part-time work rather than an increase in the number of workers is the first result of an increase in output. The present extent of part-time work in manufacturing is indicated by the fact that of the 87 industries for which the Bureau of Labor Statistics compiles data on average weekly hours worked, 28 industries reported for August 1935 an average work week of less than 36 hours and all but 15 industries a week averaging less than 40 hours. In this month the general average of 36.6 hours (secured by weighting the industries according to number employed in the years 1923-25) was the highest since August 1933. It should be noted, however, that fewer establishments report data on average hours worked than on employment and payrolls.

[15] That the 'typical' increase in output per man hour during the depression has been somewhat less than the amount given in Table 7 is indicated by the frequency distribution of estimates for 32 industries presented in Chart 4. An unweighted median of the changes in output per man hour in these industries is the figure given in *Bulletin 53*, Changes in Prices, Manufacturing Costs and Industrial Productivity, 1929-1934, by F. C. Mills. The series in Table 7 of the present *Bulletin* extends estimates that appeared in *Bulletin 51* (June 28, 1934). Certain of the earlier figures have been revised on the basis of 1933 Census of Manufactures figures now available.

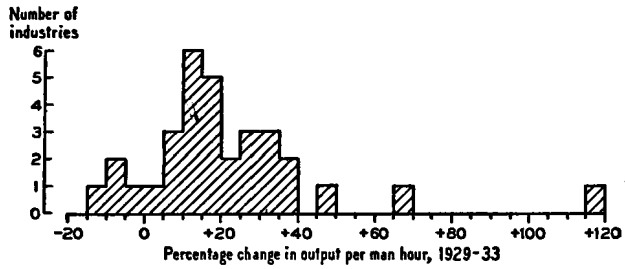
TABLE 7

OUTPUT PER WAGE EARNER AND PER MAN HOUR IN MANUFACTURING ESTIMATES[1] OF CHANGES, 1929-1934

(1)	(2)	(3)	(4)	(5)	(6)	(7)
YEAR	PHYSICAL OUTPUT OF MANUFACTURES	AVERAGE NUMBER OF WAGE EARNERS EMPLOYED	AVERAGE HOURS WORKED PER WEEK	MAN HOURS (3)x(4)	OUTPUT PER WAGE EARNER (2)÷(3)	OUTPUT PER HOUR MAN (2)÷(5)
1929	100	100	100	100	100	100
1930	84	87	93	81	97	104
1931	72	74	87	64	97	112
1932	57	62	77	48	91	118
1933	65	69	76	53	94	123
1934	69	78	70	55	88	125

[1] These figures, which must not be accepted as precise measurements, apply only to activity in manufacturing industries as a whole. Variation in output per man hour in different industries is indicated by Chart 4; see also footnote 15 and the description of the basic index numbers given in the Appendix Note.

CHART 4
FREQUENCY DISTRIBUTION OF CHANGES IN OUTPUT PER MAN HOUR
32 MANUFACTURING INDUSTRIES, 1929-1933



output per man-hour ratio. We mention the more important of these, for they have serious bearing upon the interpretation of the striking figures of Table 7.

The recent increases in the ratio of output per man hour have been largely a phenomenon of contraction, during which the volume of output, the number of employed workers and of establishments were declining over 30 per cent. Some of the increase in output per man hour may thus be the result of a lightened load on the productive structure. Moreover, during periods of falling prices and continued business depression the less efficient workers, the less efficient equipment and the less efficient establishments are eliminated. This repeated culling of the best of productive resources for use in that activity which continues tends naturally towards a high, selective ratio of output per man hour. It would seem to follow from this argument that when a more normal rate of production has again been reached, the necessary absorption of the now idle elements will tend to reduce the index to pre-recession levels. But this tendency is not likely to be effective, for positive improvements in productive processes have already been made and will, in all probability, continue to be made. In some industries, including those marked by sharp increases in output per man hour, considerable labor-saving machinery has been installed during the depression and recovery periods; in other instances improvements have been secured without further capital investment. This second type of improvement has probably been more common during the recession period, for available records show little activity either in the production or the financing of capital goods. Simplification of processes, savings in the handling of materials, and the elimination of unessential steps or occupations as well as the dropping of activities not immediately necessary, such as research, construction or maintenance have all contributed towards the economical use of labor. These are improvements that tend to reduce costs of operation, but in contrast to technical and mechanical improvements they are the more difficult to hold fast during recovery.

That there are wide variations among different industries in the increase in output per man hour is indicated by estimates for 32 individual industries, shown in the unweighted frequency distribution of Chart 4. In some industries there is evidence of a loss. The general tendency, however, is definitely upward.

SUMMARY

Records of the physical volume of production provide, during periods of changing price levels, one of the best of economic thermometers. Such records indicate that recovery continued in the United States in 1934 although lagging somewhat behind the improvement in the majority of the industrial countries of the world. In 1934 the nation's annual product was 7 per cent nearer the high levels of 1929 than it had been in 1932. Data for the first half of 1935 indicate that if the current rate be continued this year there will be a further increase equal to 6 per cent of 1929 output. Against this recovery must be set the depression decline of 35 per cent, which leaves the volume of production still 22 per cent below pre-recession levels. When population growth is considered the annual deficit is increased to over 26 per cent of 1929 production. In short, although recovery has been advancing, it has far to go before the rate of output and the standard of living of 1929 are restored.

APPENDIX TABLE
CHANGES IN THE OUTPUT OF INDIVIDUAL COMMODITIES, 1929-34

	PERCENTAGES OF 1929			
	CHANGE, 1929-32	CHANGE, 1932-33	CHANGE, 1933-34	NET CHANGE, 1929-34
Agricultural products				
Sugar, domestic	+29.7	+21.9	−37.5	+14.1
Corn	+14.6	−21.9	−38.2	−45.5
Oats	+11.5	−46.0	−18.2	−52.7
Potatoes	+ 9.2	−11.5	+19.9	+17.6
Wool	+ 8.0	+ 4.2	− 2.8	+ 9.4
Barley	+ 7.8	−52.2	−13.2	−57.6
Fruits and vegetables	+ 7.4	− 2.1	+ 3.2	+ 8.5
Meat animals	+ 5.0	+ 1.9	+ 7.0	+13.9
Milk	+ 3.8	0	− 3.8	0
Rice	+ 1.6	−10.3	+ 3.0	− 5.7
Truck crops	0	− 7.1	+ 8.0	+ 0.9
Poultry products	− 0.9	+ 0.9	− 3.8	− 3.8
Hay	− 7.5	− 5.6	−18.7	−31.8
Wheat	− 9.2	−26.4	− 4.1	−39.7
Cottonseed	−12.2	+ 0.3	−22.5	−34.4
Cotton	−12.3	+ 0.3	−22.4	−34.4
Tobacco	−33.2	+22.9	−18.4	−28.7
Minerals				
Gold	+13.9	+ 2.5	+24.4	+40.8
Natural gas	−18.9	0	+10.3	− 8.6
Crude petroleum	−22.0	+12.0	+ 0.3	− 9.7
Anthracite coal	−31.9	− 1.1	+11.0	−22.0
Bituminous coal	−42.2	+ 4.9	+ 4.0	−33.3
Crushed stone	−43.9	− 7.0	+16.3	−34.6
Sand and gravel	−46.1	− 7.2	+ 5.7	−47.6
Lead	−60.2	+ 3.6	+ 7.0	−49.6
Silver	−62.6	+ 0.6	+15.4	−46.6
Zinc, slab	−66.7	+17.6	+ 7.0	−42.1

	PERCENTAGES OF 1929			
Minerals (cont.)	CHANGE, 1929-32	CHANGE, 1932-33	CHANGE, 1933-34	NET CHANGE, 1929-34
Gypsum	−71.8	− 1.6	+ 4.0	−69.4
Copper	−72.8	− 4.7	+ 1.9	−75.6
Iron ore	−86.5	+10.5	+ 9.7	−66.3
Series relating to manufacture				
Sheep, inspected slaughter	+28.0	− 3.4	− 0.9	+23.7
Mechanical refrigerators	+22.0	+47.0	+48.9	+117.9
Rayon	+11.1	+60.8	+ 1.5	+73.4
Butter	+ 6.1	+ 4.3	− 6.9	+ 3.5
Cheese	+ 1.5	+ 9.9	−15.6	− 4.2
Calves, inspected slaughter	0	+ 9.9	+54.9	+64.8
Cottonseed oil	− 4.6	−10.3	− 2.8	−17.7
Hogs, inspected slaughter	− 6.2	+ 7.2	−10.3	− 9.3
Cattle, inspected slaughter	− 8.0	+12.6	+55.2	+59.8
Gasoline	−10.0	+ 2.5	+ 3.0	− 4.5
Silk deliveries	−11.2	−13.1	− 1.4	−25.7
Cigarettes	−13.3	+ 7.3	+11.4	+ 5.4
Boots and shoes	−13.6	+10.0	+ 1.8	− 1.8
Electricity	−14.6	+ 2.3	+ 5.9	− 6.4
Flour, wheat	−15.8	+ 0.9	+ 1.0	−13.9
Canned milk	−18.2	+ 5.5	+ 9.8	− 2.9
Kerosene	−21.9	+ 9.4	+ 7.3	− 5.2
Sugar meltings	−22.1	− 1.9	0	−24.0
Wrapping paper	−22.5	+12.2	− 5.2	−15.5
Wood pulp	−22.7	+11.0	+ 4.1	− 7.6
Leather	−23.2	+12.2	+14.7	+ 3.7
Newsprint paper	−25.7	− 8.4	+ 4.3	−29.8
Paperboard	−25.8	+17.4	− 0.1	− 8.5
Cotton consumption	−29.6	+17.4	−11.3	−23.5
Cigars	−33.0	− 2.1	+ 4.2	−30.9
Wool consumption	−34.0	+22.3	−23.3	−35.0
Fuel oil	−34.1	+ 5.1	+ 1.5	−27.5
Lubricating oil	−35.2	+ 4.1	+ 7.3	−23.8
Book paper	−36.8	+ 8.9	− 1.7	−29.6
Fertilizers	−40.7	+ 4.1	+12.7	−23.9
Tires	−41.7	+ 7.9	+ 2.9	−30.9
Inner tubes	−46.6	+ 8.7	+ 4.9	−33.0
Sulphuric acid	−48.1	+ 8.7	+ 6.1	−33.3
Explosives	−53.0	+ 4.5	+11.9	−36.6
Lime	−54.1	+ 7.2	+ 3.3	−43.6
Cement	−55.3	− 7.9	+ 8.8	−54.4
Tin deliveries	−59.1	+23.7	−12.6	−48.0
Wool carpet and rug loom activity	−62.2	+17.8	− 2.3	−46.7
Coke	−63.6	+ 9.7	+ 7.0	−46.9
Plate glass	−65.3	+22.5	+ 3.5	−39.3
Trucks	−69.5	+14.4	+31.4	−23.7
Copper consumption	−70.8	+ 9.0	− 3.7	−65.5
Lumber	−72.0	+11.1	+ 0.1	−60.8
Flooring	−73.3	+ 1.5	0	−71.8
Passenger cars	−75.2	+ 9.5	+13.6	−52.1
Steel ingots	−75.6	+16.8	+ 5.4	−53.4
Air craft	−77.5	− 1.1	+ 4.7	−73.9
Pig iron	−79.7	+11.1	+ 5.9	−62.7
Locomotives	−87.8	− 9.8	+ 9.8	−87.8
Railroad cars	−96.5	− 1.3	+24.3	−73.5

NOTES ON SOURCES OF DATA AND CONSTRUCTION OF INDEXES

Chart 1. The measures of industrial output in the United States include the production of minerals and manufactures and also the volume of construction. The component indexes appear in Table 3. Index numbers for other countries are those computed by the following agencies: Canada, Dominion Bureau of Statistics; United Kingdom, Board of Trade (see below); Germany, Institut für Konjunktorforschung; France, Statistique General; Italy, Ministero delle Corporazioni; Sweden, Sveriges Industriförbund; Japan, Ministry of Commerce and Industry. Different methods used in constructing the index numbers and variation in the coverage of productive activities reduce somewhat the comparability of the measurements. The index for the United Kingdom as published by the Board of Trade has been altered somewhat by combining with it the estimates of construction volume shown in Chart 2, with weights based upon the numbers employed in 1931 in building and in other industrial activities. The purpose of this adjustment of the British series is to improve its comparability with the other indexes.

Chart 2. Changes in the output of mineral products, textiles, and manufactured foodstuffs are based upon groupings of series included in the general index numbers. Changes in steel output and in construction activity are taken from available records for each country. The output of steel is represented in every general index. Construction is also included in the general averages, except in that for Japan, for which no estimates of building activity are available, and in that for Sweden, for which estimates of residential construction only are available. The Swedish estimates are used in Chart 2, however.

All measures showing the extent of decline and recovery in the various industrial divisions are relative to 1929 output. Whenever the decline, relative to 1929, did not occur until 1931 or 1932, the change has been computed from the 1929 level and no entry made for the changes during the intervening years. Where the 1933 recovery did not continue in 1934, chiefly in the textile division, the extent of recovery remaining is the 1934 figure shown.

Chart 3. The monthly series are subgroups of the Federal Reserve Board index of manufacturing production, the two groups, perishable and semi-durable goods having been computed from the Board's index of non-durable goods. The industries included in each group are as follows. Perishable: meat packing, flour, sugar refining, tobacco products, petroleum refining, paper and printing; Semi-durable: textiles, leather, boots and shoes, rubber tires and tubes; Durable: iron and steel, coke, lumber, transportation equipment, cement, glass, lead, zinc, tin. It is probable that fluctuations in the aggregate of manu-

facturing industries are somewhat less in amplitude than is indicated by these samples, first, because the possibilities of offsetting movements of the components are greater; second, because a higher percentage of the more fabricated products is present than in these restricted samples. The annual index numbers given in the tables and in the text differ somewhat from the annual averages of these monthly figures. These differences are indicated on the chart by the length of the arrows joining the charted points of the two annual averages. With one exception the more comprehensive averages are higher, with reference to the 1929 base, than those of the monthly series. This exception occurs in the average of the output of perishable goods in 1934, the smaller sample being the more influenced by the sharp rise in the meat packing industry occasioned by the distress selling of cattle following the drought. The decline in the slaughter of meat animals in 1935 has restored the former relationship between the two averages.

Table 3. The output of farm products is measured by the index of agricultural production of the United States Department of Agriculture. The indexes of output of minerals and of manufactured products have been constructed by the National Bureau of Economic Research from statistics of annual production of 18 minerals (pig iron is considered a manufactured product) and from available data on manufacturing industries. The index of manufactures, which is based on the biennial reports of the Census of Manufactures, is similar to that described in *Economic Tendencies* and in *Bulletin 51,* Appendix B. In applying weights to the various components, changes during the depression in the importance of different industries are considered.

The index of construction volume is based upon the estimates of private, public utility and public construction given in the text. Correction was made for changes in construction costs as measured by the composite of (a) an index based upon wages of skilled and unskilled workers employed in building as compiled by the *Engineering News-Record* and a specially weighted index of wholesale prices of building materials; and (b), an average of the index of costs in all types of building of the American Appraisal Company and the index computed by the United States Bureau of Public Roads from data in bids accepted for Federal highway construction. Some attempt is made in the latter indexes to take account of technological changes. The index of total production is a composite of the above groupings with the weighting factors given in footnote 5 to the text. The figures used in this and all other calculations have been carried to more decimal points than are given in the tables.

Table 7. The indexes given in Table 7 extend those given in Table III of *Bulletin 51,* which were described in the Appendix Note to that *Bulletin.* The index of manufacturing output, which includes both finished and semi-finished goods, is that of Table 3 above; the index of average number employed is from the Census of Manufactures, with estimates for non-censal years based upon the employment index of the Bureau of Labor Statistics. The index of hours worked per week for 1932-34 is based on the sample returns compiled by the Bureau of Labor Statistics; for 1929 the estimate is the full-time hours reported in the Census adjusted by the ratio of actual to nominal hours per week for the industries in the National Industrial Conference Board sample. Estimates for other years were obtained by interpolation.

COOPERATIVE RESEARCH

Following its custom of inviting representatives of other agencies to assist it in planning its research program the National Bureau held a conference on June 1 at which the following resolution was adopted:

That at the initiative of the National Bureau of Economic Research a committee be appointed by the departments of economics of selected universities, or by the appropriate equivalent economic research organizations of these universities. The representatives should be not more than two from each university so invited.

That this committee, in conjunction with the National Bureau, through its two representatives on the committee, should examine the major research problems of common interest, should undertake if possible one or more cooperative projects of economic research, and not later than the end of 1937 should recommend that form of continuing organization which study and experience have suggested.

Accordingly the National Bureau invited representatives of six universities—Harvard, Columbia, Pennsylvania, Chicago, Wisconsin and Minnesota—to meet with its representatives at Shawnee-on-Delaware, September 7-8. After discussion concerning the best methods of organizing research so as to retain the stimulus of intellectual initiative on the part of individuals while securing the advantages of cooperation, it was agreed that the National Bureau should call two conferences, one on price research, the other on the distribution of wealth and of income. At these conferences specialists will examine the objectives of studies in their respective fields, consider the formulation of programs of research and explore the possibilities of cooperative action. Both universities and organizations which are carrying on research in these and allied fields are to be represented.

The meeting on price research is to be held on November 29-30; the date of the meeting on the distribution of wealth and of income has not yet been determined.

National Bureau of Economic Research

BULLETIN 64

MAY, 1937

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

X:6:2m.73-N4
G7
21

A Program of Financial Research

Copyright 1937, National Bureau of Economic Research, Inc.

Origin of the Exploratory Committee on Financial Research

To an increasing extent in recent years thoughtful people have been asking searching and fundamental questions about money, banking and finance. This attitude of inquiry permeates many groups. It is notably prevalent today among those most intimately and directly concerned, including bankers and other operating officials of private financial institutions, faced with the problem of adjusting their activities and adapting their organizations to current conditions, as well as legislators, public officials and supervisory authorities, who are responsible for establishing the legal framework within which financial institutions function. The following questions indicate the trend of their thought.

1. Has our financial organization, as a whole, accentuated booms and deepened depressions? How can it be used to moderate them?

2. What principles should be applied in the relationship of government to private financial institutions?

3. What are the essential services that financial institutions provide? Are they organized to function effectively?

4. What should be the basis of competition between different types of specialized financial institution? To what extent is competition among them in the public interest? Has competition of some types tended to weaken the financial structure?

5. What are sound credit standards, in instalment financing, real estate financing, investment financing? In what ways does the lowering of these standards not only weaken an individual institution, but also undermine the credit situation as a whole?

6. What is the significance of (a) the decline in the demand for commercial loans? (b) the current low level of interest rates?

Questions like these, simple as they appear, are not easy to answer. Our organization of finance is highly complex. It is made up of many thousands of individual institutions characterized by great diversity of size, and by varying degrees of specialization. In it are commercial banks, savings banks, Morris Plan banks, industrial banks, mortgage banks, investment banks, Federal Reserve banks, home loan banks, credit unions, finance companies, insurance companies, investment trusts, security exchanges, brokerage houses, and many others. All these institutions are more or less specialized. Some are huge organizations, nationwide in scope, others operate within narrowly defined geographical limits. Together they constitute our system of finance, the mechanism through which essential financial services are rendered the community. But it is a system whose growth has been haphazard; it has not been planned. Our knowledge of its workings is inadequate. When new problems arise, we are not in a position to solve them; nor, when questions such as those noted above are raised, can we give factual answers.

Recent experience has demonstrated that we cannot postpone solutions and answers indefinitely. Our system of finance has long functioned inadequately, despite a greater degree of public supervision than is common in most other highly industrialized countries. Ever since the outbreak of war in 1914 it has been faced with new problems which neither its organization nor its experience had prepared it to meet. In its divers- reactions to the unbalanced forces that have swept the world during the last two decades it has seemed to many thoughtful people to have accentuated whatever was most dangerous in each new situation. Under good conditions its expansion at times was unrestrained, and under adverse conditions it

NATIONAL BUREAU OF ECONOMIC RESEARCH BULLETINS—Annual Subscription (Five Issues), $1.00
Single copies, this issue, twenty-five cents

collapsed. Taking the period as a whole, thousands of individual units have been forced to the wall and for a time in 1933 the mechanism stopped functioning and the community was deprived entirely of the advantages of a financial organization.

Even though we are emerging from depression, still there are numerous conditions in the realm of finance that are new to our experience and whose implications we cannot judge. It is clear that the time calls for a new approach to the entire problem of finance, an approach that is not limited to single institutions or to piecemeal legislation, but that contemplates a continuous examination of our financial organization as a whole in relation to the essential services that justify its existence. This is recognized not only by public officials, economists and students of finance, but also by far-sighted bankers and executives of private institutions who realize that their own institutions cannot be regarded as isolated units unaffected by conditions in the rest of the credit system; that the financial stability of one institution depends not only on the quality of its assets, but also on the soundness of the credit structure as a whole. The primary need is to determine the facts and establish principles. Mere discussion of controversial issues is purposeless. Research by an impartial agency is the most effective means of fulfilling the need and avoiding the pitfalls of partisanship.

These considerations led to the appointment of an exploratory committee on financial problems by the National Bureau of Economic Research. Early in July of 1936 the Committee on Nationwide Banking Research of the Association of Reserve City Bankers suggested to officers of the National Bureau that an impartial agency should undertake a comprehensive survey of the banking structure of this country. This suggestion was thoroughly discussed at a subsequent conference, held at the Chase National Bank on July 21, 1936, between the Committee on Nationwide Banking Research and representatives of the National Bureau. As a result the National Bureau was requested to appoint a small committee to explore the subject of financial research with two objectives: (1) to prepare an inventory of relevant scientific work now in progress, and (2) to draw up recommendations of procedure which in the judgment of the Committee might be expected to lead to a better common understanding of the financial problems facing this country.

The National Bureau thereupon formally appointed the Exploratory Committee on Financial Research—Winfield W. Riefler, Chairman; David Friday, Walter Lichtenstein and J. H. Riddle—which submits its report herewith. The Committee engaged Ralph A. Young of the University of Pennsylvania to assume charge of its inventory and also to act as its Secretary. It has directly, or through the efforts of Dr. Young, endeavored to get into contact with all substantial projects in financial research now current. The sum of $7,500 was appropriated by the Association of Reserve City Bankers to the National Bureau to finance the work of the Exploratory Committee.

The National Bureau of Economic Research welcomes this opportunity to express its appreciation of the initiative shown by the Committee on Nationwide Banking Research of the Association of Reserve City Bankers in seeking a disinterested approach to the solution of financial problems. It wishes to thank also all those with whom the Committee has been in touch for their active, prompt and cordial cooperation. Without such cooperation this report, and especially the Exploratory Committee's inventory, published separately as Volume II, would not have been possible.

And without the continued collaboration of those who have so far aided and the active participation of others in government, in banking, and in universities, this ambitious program in the public interest cannot hope to be successful.

In accordance with the decision of the Executive Committee of the National Bureau on February 11, its officers have initiated the negotiations designed to bring practical realization to the Committee's plans.

PART ONE

The Problem and the Committee's Recommendations

THE PROBLEM

THERE is wide recognition in this country of a need for much more fundamental research into financial problems. There is an equally wide disposition throughout large sections of the community to cooperate with and to provide support for a program of impartial research. This cooperative attitude characterizes practically all groups concerned with financial problems, divided as they otherwise are by conflicts of interest and controversies with respect to the many financial questions at issue. The desire for a more basic and disinterested approach to problems of finance arises, in fact, from the very existence of these conflicts and controversies; for they indicate the extraordinary state of confusion that pervades public thinking on financial matters today, a confusion that will persist, it is feared, until the entire subject is clarified by impartial study.

This state of mind reflects the drastic financial experiences through which the nation has passed in recent years, a series of experiences that as a whole have no precedent in history. After assuming the exhausting burden of financing the World War we have passed through the post-War depreciation of currencies, the reestablishment and subsequent breakdown of the international gold standard, and the virtual collapse of our major financial markets—for stocks in 1929, for bonds in 1931, and for mortgages in 1932. With the banking crisis of 1933 still fresh in our memories we have seen a growth of excess banking reserves to enormous volume, a decline of interest rates to exceptional levels, and more recently, a striking revival of business activity without a corresponding revival in the demand for commercial credit. Taken individually, there are historical parallels for many of these phenomena. Taken collectively, they are without precedent. Their essential nature and the lessons they may embody in terms of future financial repercussions are still the subject of violent controversy and to a considerable extent lack authoritative interpretation from any source.

Divergent opinions concerning the significance of these developments cannot be ascribed to lack of effort on the part of students of financial problems, nor to lack of funds for far-reaching programs of research. During this same period financial data have been compiled, financial problems analyzed, and specialists trained in financial research at an exceptionally rapid rate—within governmental bureaus and private business and financial institutions as well as at the universities and at institutions devoted to economic research. Many of the divergencies are due rather to a lack of coordination of these efforts and facilities, large as they have been, and generous as has been their support. There has not existed during any part of this period, nor in fact since the termination of the work of the National Monetary Commission, any agency responsible for the coordination of separate inquiries into financial problems as parts of one whole. In the absence of such an agency, areas for research have been unevenly developed, leaving large and important sectors, such as the organization of mortgage finance and instalment credit financing, relatively unexplored. Furthermore, operating officials of private financial institutions have frequently been out of effective contact with research. It has been difficult, consequently, for the research specialist to utilize the valuable experience and insight bankers have to contribute, and they in turn have frequently been slow to apply to their own problems the well established findings of research. To a certain extent there has been a similar lack of contact among those working in the field, engaged either in the compilation of financial material or in the analysis of financial problems. Consequently, the emphasis put upon financial research in recent years has in some cases contributed to the confusion, conflict and controversy. Faced with urgent demands for the interpretation of forces as unexpected and unforeseeable as those which have swept the financial organization of society during this period, financial specialists have been compelled to advance tentative explanations based upon incomplete data. It is inevitable under the circumstances that these should frequently have been at variance with one another.

The program recommended by the Committee must meet the conditions imposed by this background. First, it must suggest specific studies for which there is urgent need. For example, our financial institutions should be resurveyed on a much more comprehensive basis. This survey should not be limited to banking institutions alone, but should embrace the entire financial organization. Second, if research activities are to be really useful and to remain in focus upon a changing scene, the program must provide a continuing mechanism by which they can be readapted from time to time in accordance with current developments. This mechanism should be of such a character that it may be continued as long as need for it exists. Finally, it must provide in its basic pattern of organization for the active cooperation and participation of public officials and of officers of private banking and financial institutions, as well as of specialists in finance from the universities, from business research bureaus, and from other institutions devoted to the compilation of financial data and to the analysis of financial problems.

The Committee is fully aware that the accomplishment of these objectives is not easy. In any field composed of groups with strongly divergent interests, a program directed towards cooperation, even upon the plane of impartial research into common problems, presents great difficulties. In the financial field these are magnified not only by competition among the various financial groups, and tensions between these groups and public supervisory authorities, but also by controversies among experts themselves concerning the fundamental nature of the issues.

The Committee believes, however, that the magnitude of the need presented outweighs the hazards and that the program it has worked out can be made to function. It has been evolved to preserve the requirements of objectivity, and to provide a framework within which leaders in the various fields of private finance, governmental authorities, and university specialists can pool their resources, their insight, and their experience in the pursuit of a common understanding. The fact that the most acute

tensions of the financial crisis are now receding into history makes the present propitious for the inauguration of such a program; the fact that the initiative in the appointment of this Committee was taken by a group of private financial institutions indicates that the need is widely felt; the cordial cooperation the Committee has received from those actively engaged in financial research everywhere, in the government and in the universities as well as outside, augurs well for its feasibility.

SUMMARY OF COMMITTEE RECOMMENDATIONS

Briefly stated, the Committee recommends: (1) projects in areas where factual information and disinterested analysis are urgently needed at present; (2) provision for a continuing organization to foster and coordinate financial research and to maintain it in a relevant relationship to changing situations. The Committee proposes that the National Bureau of Economic Research seek the cooperation of governmental bodies, interested banks and investment institutions, educational foundations, and public spirited individuals in sponsoring the organization of a small central staff to stimulate and administer research in this field.

1. To keep in touch with and to act as a continuing body in the coordination of financial research, wherever it may be carried on.

2. To provide immediately for the inauguration of a comprehensive survey of the financial structure as a whole along lines described in detail later in this report.

3. To formulate specific research projects into specific problems of vital importance that fall outside current research programs (several are outlined in detail in the section entitled Specific Projects).

4. To arrange for a more adequate analysis of research findings; if possible, prior to the publication of underlying data.

5. To secure the active participation in this work of public officials and of operating officers from private financial institutions.

6. To organize, as occasion demands, commissions of inquiry on questions of policy where the issue is not primarily one that requires the collection or analysis of facts, but rather the judgment of competent, disinterested persons on the relevance of facts already assembled.

7. To assure the publication of the results of this program currently as they become available in such a way that their full significance may be recognized and the contribution they have to offer be effective.

It will be noted that these recommendations conceive of financial research as a living process that can be of incalculable aid in the clarification of current controversies and in the creation of a broader basis for the formulation of public policies. To perform these functions, the program of research here envisaged cannot be restricted to any individual group or institution, it must embrace and include in its scope all those who have insight or experience, public officials and operating officers of private financial institutions as well as specialists in the field of financial research.

To launch this program on a basis sufficiently stable to demonstrate the feasibility of the approach will require financial support adequate: (1) to meet the expenses of the central staff during a definite period of demonstration; (2) to assure the completion of the specific research projects inaugurated by the staff during that period. Funds for all these projects will not, of course, have to be provided, since in considerable part they will call for the extensive use of the data and facilities of governmental research agencies. The Committee is of the opinion that five years should be sufficient to indicate the value of the proposed program and that steps should immediately be taken to obtain funds. It is recommended that all the various sponsors of the plan be requested to assist in the provision of funds with the exception of cooperating public authorities. The latter are not in a position to finance non-governmental activities. They should be requested to make their contribution to the common effort directly in the form of cooperation on the part of their research agencies.

Administration of the funds should be entrusted to a special committee of the National Bureau of Economic Research having membership drawn from all the groups that cooperate in sponsoring the program. The central staff should be organized by and attached directly to the National Bureau of Economic Research. The projects, however, should be carried out at various places—by governmental research agencies, by institutions organized expressly for economic and financial research, by university departments having research facilities, and by business research bureaus and private business and financial agencies. In addition, the central staff should consult with and secure the criticism of all the cooperating groups both in the formulation of projects and in the analysis of findings. The agency chosen for each project should be one that because of its situation, its resources, and its personnel, is in a position to contribute most. By organizing the support of financial research in this way, the Committee feels that all the talent, resources and skill

the nation possesses in this field can be mobilized for the study and solution of its financial problems.

INVENTORY OF CURRENT FINANCIAL RESEARCH

The inventory of current financial research in Part Three indicates at once the extent of the area which financial problems permeate and the wealth of specialized data, resources and talent available for a more coordinated program looking towards their solution. It is not proposed to summarize the inventory in this report, but rather to indicate the nature of the major gaps in research or deficiencies that the program recommended by the Committee is designed to fill.

The scope of current research indicated by the inventory attests the enormous progress that has been made in the available data since the publication of the reports of the National Monetary Commission. Especially is this true with respect to banking data. There is now available comprehensive information at frequent intervals covering practically all phases of Federal Reserve bank operations and data nearly as comprehensive covering gross assets and liabilities of our commercial banks. This great body of information is to be found in the reports compiled by the Board of Governors of the Federal Reserve System, the Comptroller of the Currency, the Federal Deposit Insurance Corporation, and the various state banking departments. It is available by geographical regions and in some cases it has been classified by the size of banks. Fairly complete information is also available covering bank earnings and expenses, certain major categories of bank assets and liabilities, bank failures and reorganizations, and the movement and structure of interest rates in the money market. Within these broad classifications there is need for much more detailed data, particularly on bank deposits where a clear understanding of the role of money in our economic system requires that material indicating the size, activity and movement of the deposit balances of different economic groups be made available and subjected to painstaking analysis. In addition to these data, which relate largely to the operation of banking institutions as such, there is a variety of information, but much less comprehensive or continuous in character, covering the operation of savings banks, building and loan associations, insurance companies, etc. Great progress has also been made by the Department of Agriculture and the Farm Credit Administration in mapping out the main outlines of the field of agricultural and farm mortgage credit, and by the Department of Commerce in analyzing the balance of payments, and by the Department of Commerce and the Treasury in studying the movement of foreign investment funds into and out of the United States.

Certain major areas of financial activity have, on the other hand, been almost entirely neglected, for example, the general field of consumption loans. That consumer financing in the sense of instalment and personal loan financing has become a major credit service is generally recognized, but we know relatively little of its aggregate size, movement or structure. Another neglected area is the considerable volume of financing that is carried on outside established banking channels in the form of dealer and manufacturer credit, finance company activities, etc. Its existence also is widely recognized, but again we know little of its size, movement or structure. Data covering both these areas are essential if we are to judge the significance of the small current demand for commercial loans at banking institutions. Before we can assess the extent to which the small demand for these loans reflects a decline in the demand for credit, we must have data showing the extent to which these same credit demands are now being supplied, either through other banking activities or through the operations of non-banking credit agencies. Until recently the field of urban mortgage credit, probably the largest single category of credit in our financial system, was also characterized by a complete absence of comprehensive or reliable data. This deficiency is now being rapidly repaired, especially in the case of urban residential mortgage credit, where an enormous amount of material is becoming available through the combined efforts of the Department of Commerce, the Federal Housing Administration, the Home Loan Bank Board, the New York Mortgage Commission, and the National Bureau of Economic Research. Promising as this material is, it still requires amplification in many particulars and a considerable amount of detailed analysis before it can be assimilated into the general body of financial data. Two other major deficiencies are the inadequacy of data concerning long term capital financing, an area in which some progress is being made by the Securities and Exchange Commission, and the inaccuracy of the material covering state, municipal and local public debt.

This brief survey is sufficient to indicate that most of the financial data now available have been compiled by public agencies. The larger share of the analytical work current in the field of financial problems also rests in the main on official initiative and support. Research by other agencies into financial problems has been devoted mainly to the analysis of existing data, although occasionally it has taken the form of small sampling surveys. To a cer-

tain extent, the preponderance of official activities in the field of financial research reflects simply the fact that public authorities have been in a supervisory relationship to financial institutions and have been required in consequence to compile and publish basic data with respect to the institutions under their jurisdiction. It also reflects the fact that basic exploratory surveys designed to open new areas of financial relationships are costly to conduct and have been dependent, therefore, largely upon public funds for support. In addition to these special factors, however, public authorities have been among the first to recognize the value of research as a tool in the development of operating policies. The recent inauguration of research programs by numerous groups of private financial institutions, such as the state programs of banking research described in the inventory, constitutes a promising sign that this situation is changing and that in the future basic financial research will not continue to rest predominantly upon governmental initiative.

The participation of private financial institutions is almost a prerequisite for certain types of basic financial research, especially on such problems as deal with the soundness of credit. The fundamental importance of sound credit is everywhere recognized; without it the most perfectly articulated financial structure will come to grief; with it basic weaknesses may exist in the superstructure of finance without bringing in their train an inevitable and inescapable collapse. Generally as this is recognized, the concept of what does or does not constitute sound credit remains intangible and has still, for the most part, to be reduced to definite principles that can be illustrated from the experience of operating institutions, and adapted to new credit problems as they arise. Without the active participation of operating financial institutions, further progress in this field will be limited in the main to relatively simple generalizations. The analysis of the mortgage data mentioned above, for example, will throw light on some of the principles which should govern the sound extension of mortgage credit; an investigation into the influence of brokers' loan liquidation in 1929 on the deposit balances of consumers will help to reveal the effectiveness of the regulations recently adopted to control the extension of credit on securities. A partial study into methods of financing consumer credit may also be conducted without the participation of operating financial groups. However, to formulate the principles that make for sound credit standards in any fundamental sense will require their active cooperation, not only in providing data covering their operating experience, but also in lending the services of their most expert operating personnel.

The inventory also reveals the relatively limited areas in which specialists in finance at the universities are carrying on basic financial research. Such participation as there is in broader projects, in fact, exists for the most part in connection with those publicly financed or sponsored by research bureaus. This situation reflects the inability of the universities to finance individual programs and the absence of a coordinating agency capable of bringing the university specialists into effective contact with programs inaugurated by other agencies. The costly nature of current financial research has had the unfortunate consequence of separating work at the universities from close contact with work at the frontiers of inquiry. It should be one of the important tasks of a coordinating body to reestablish such contact and to restore to financial research the assistance of those most favored by their position to exercise unbiased judgment.

SPECIFIC PROJECTS

The Committee recommends the following major research projects to the central staff. All are necessary and merit its immediate attention. This program of financial research is in no sense complete. It is advanced rather as a sketch of the principal areas in which a considerable amount of research is needed to repair the deficiencies outlined above. In Part Two there are outlined several additional projects, more specific in nature, which are designed to illustrate the manner in which these major areas may be broken down for analytical purposes.

Comprehensive Survey of the Financial Structure

As indicated above, a comprehensive survey of the financial structure as a whole is urgently needed to provide a background for the analysis of financial problems and to give perspective to proposals for changes in the financial structure. Before we, as a society, can make great progress in the reform of our financial structure, before we are in a position to provide respectable answers to the questions, 'What are the essential financial functions?' and 'What social institutions or organizations are best fitted to perform them?' we need relatively satisfactory answers to the more elementary questions, 'What financial services are now being rendered?' and 'What institutions and organizations are now providing these services?' In other words, we need, as a basis for further analysis of the functioning of our financial institutions, a much more comprehensive picture of the current scope and range of their activities.

This survey must not be limited to central banks and commercial banks where our information is now relatively most complete. It must include the activities of savings banks, building and loan associations, Morris Plan banks, mortgage banks, investment banks, insurance companies, finance companies, and underwriting houses. It must be sufficiently comprehensive, furthermore, to show not only the structure and functions of these various types of financial organization taken individually, but also their relative importance and their interdependence. Without this basic financial survey, comprehensively outlined and filled in with some detail, it is impossible to come to any well considered opinion concerning many of the most pressing financial problems of today. For example, how can we assess the relative importance of fluctuations in instalment financing during (1) the prosperity of the 'twenties, (2) the depression of the early 'thirties, (3) the current revival—if we are only dimly aware of the dollar volume of funds involved, and in no position to contrast incomparably larger concurrent fluctuations in real estate financing? How can we arrive at a balanced judgment concerning the present low demand for commercial loans at our banks if we do not know the extent to which other types of institution are materially expanding their loans in this field? How can we discuss reorganization of the banking structure when we do not have the facts by which to judge the adequacy of banking facilities in many communities and do not know the extent to which local demands for financial services justify the maintenance of different types of local financial institution?

In the opinion of the Committee this comprehensive survey should start with the aggregate needs of the community for various types of financial service. It should seek first to answer the question, 'What are the financial commitments—the financial assets, liabilities, and other equities of the people of this country?' For example, 'What are their aggregate holdings of cash, demand deposits, savings deposits, shares in building and loan associations, investment securities, etc.?' and 'What are their aggregate commitments or debts, on mortgages, instalment paper, etc.?' So far as possible these aggregates should be broken down by business or consumer groups, income groups and by geographic areas. From this basic material a comprehensive picture of financial organization can be built up. In the analysis of the various financial operations that must be performed and the more or less specialized institutions through which they are executed financial services that represent activities conducted directly with the public should be differentiated from those financial services which give flexibility and liquidity to the financial structure.

Both types of service are essential to a well ordered financial system, but the standards by which their operation are to be judged differ greatly. Among the first are included those services which are performed by financial organizations in dealing with the general public—neighborhood banks, savings banks, building and loan associations, etc., which act in the main as retail financial outlets serving the public. The quality of credit, its soundness, and its relative availability for competing needs are determined to a considerable extent by the credit standards to which these institutions adhere and the credit procedures they apply. The second type of financial service is performed mainly within the organization of finance—by the Federal Reserve banks, correspondent banks, acceptance and discount houses, security exchanges, etc. They represent the coordinating elements, the nerve centers of our entire financial mechanism. In recent years the background within which they operate has changed greatly, requiring in many cases a new statement of their responsibilities and functions. For example, central banks, ever since the War, have been asked to assume an increasing degree of responsibility for the maintenance of economic as well as financial equilibrium. Under the pressure of these demands they have developed new instruments of action. The area of activity covered by central banking operations at present, in consequence, differs radically from that which was accepted as standard as late as twenty, or even ten years ago.

The Committee is convinced that in the basic picture thus obtained many of our financial problems would appear in a new perspective. It would throw light on the aggregate volume of debts, on the distribution of debt burdens among different geographic areas and different economic groups, and on relationships between savings, investment and consumption. It would also make it possible for us to distinguish between those financial repercussions which are the direct result of faults in the organization of finance and those which merely reflect more comprehensive forces sweeping the entire economic structure. Phenomena, for example, such as the wiping out of the purchasing power of large groups of consumers during the brokers' loan liquidation in 1929, the freezing of the mortgage market in 1932, and the banking panic of 1933, though they were precipitated in large part by the immediate economic circumstances, reflect primarily faults in the organization of finance. Phenomena, on the other hand, such as the Florida land boom, the War boom in agriculture, and the post-War expansion in urban real estate, originated outside the financial structure, and the resulting dislocations would probably have given rise to repercussions of some magnitude under any organization

of finance. In such cases the problem presented for analysis is the extent to which our financial organization serves to counteract or to accentuate such tendencies. Finally, the material made available should reveal the competitive background within which financial institutions function and should indicate the extent to which facilities for the rendering of financial services are inadequate or redundant.

The central staff should not limit its plans to drawing a broad, cross section picture of our financial structure as outlined above. In order that this picture may be maintained up to date, the staff should seek also to provide for a current recording of basic changes in its major components as they occur. It is not enough, for example, to have a comprehensive picture of the structure of the mortgage market or of consumer financing in 1936. Interest rates, values, debt burdens, and consumer commitments change rapidly, and data indicating the more important of these trends are needed at relatively frequent intervals. It should be possible, once these basic fields have been explored, to provide for the regular compilation and dissemination of this material.

Effects of Legislation and of Public Supervision of Credit

The Committee recommends that the central staff provide, concurrently with the comprehensive survey outlined above, for a general analysis of the effects of legislation and of public supervision of credit on the evolution of the financial structure. In this country financial institutions have long been subject to public examination and supervision with the result that the direction in which they have grown has been affected to a considerable extent by legislation. In most cases, the influence thus exerted has been purposive. For example, the government has sought at times to facilitate and at times to impede the spread of branch banking. It has sought to segregate investment and commercial banking, to throw legislative safeguards around the investment of savings deposits, trust funds, etc. There are also cases, however, in which the influence of legislative enactments has been inadvertent. The fact, for example, that institutions specializing openly in intermediate industrial credit have not developed, and indeed, that evidences of debt to finance intermediate credit needs are difficult to find, implies neither that these credit needs are relatively small in this country nor that they have not been supplied by our financial institutions. Rather banking legislation has favored financial assets in the form of short term commercial notes, and banks as a consequence have tended to finance longer term demands by advancing funds under this form with the understanding that these short term notes would be renewed on maturity. Another example of inadvertent influence is afforded in the field of real estate finance. Legislative preference for short maturity paper was probably a factor in the evolution of the practice of financing long term transactions through the use of three and five year mortgage instruments. A comprehensive survey of the whole field of public supervision of credit, showing the extent to which financial institutions are subject to legal regulation in this country and the part that such regulation has played in the evolution of the credit structure, is badly needed. It should be conducted separately from the comprehensive survey of the structure of finance outlined above, in the sense that it should use a different type of personnel with different training and background. It would be advantageous, however, for the two studies to go forward simultaneously. They have many points in common and in many instances one inquiry would provide material for both.

Review of Credit Standards

The studies outlined above should indicate the sources of various demands for credit and the competitive agencies through which these demands are now being met. They should also indicate whether the existing agencies are those best fitted to supply the various types of credit and whether the present financial superstructure should be modified in the interest of a more stable financial system. For example, they should help provide the data to answer the question, 'Is it desirable for a commercial bank to make instalment consumer loans?' They will not, however, throw light on financial repercussions that arise from faulty credit procedures rather than from points of tension in the structure and organization of credit. They will not answer the question, 'By what means can we distinguish, in the case of instalment consumer credit, between a sound and an unsound loan?' The following three studies recommended by the Committee are designed to meet this type of deficiency—in instalment financing, mortgage financing and investment financing. They are not concerned with the suitability of various types of financial institution to specialize in loans in these fields, but concentrate instead on the procedures and standards required to raise the quality of credit granted irrespective of the lending agency involved.

1. STANDARDS OF CONSUMER CREDIT

Instalment financing of consumer purchasers withstood the strain of the depression so well and showed such relatively small losses throughout the crisis as compared with many other types of credit instrument that banks and other financial agencies, pushed to find outlets for surplus

funds, are now expanding rapidly in this field. This expansion, moreover, is assuming a competitive form, with respect not only to interest rates and other financial charges, but also to the down payment, the term of loan, the security, and the amount extended in relation to the income of the borrower. As a result, pressure is being brought to bear to relax the strictness of the procedures that tended to safeguard instalment financing during the depression. The Committee feels that, in view of its potentialities, this situation deserves careful analysis. At present, it is impossible to decide with any confidence whether these modifications of procedure are justified or whether they constitute introduction of credit standards which are far too lax and which may have serious repercussions. In the present state of knowledge, such judgments cannot be based on data drawn from broad experience, they must be largely expressions of opinion. It is essential, the Committee holds, that an effort be made to gather all the available data on this type of financing for the purpose of identifying those credit standards which are sound and have stood the test of experience.

2. STANDARDS OF REAL ESTATE CREDIT

A similar study is needed in the field of real estate credit. The financing of real estate constitutes one of the most basic and essential financial activities in our economy. It is widely felt, however, that the real estate mortgage was subjected to more abuse and over-extension during the expansion of the 'twenties than any other credit instrument. During the depression the real estate mortgage market was probably more completely frozen than any other domestic financial market. Stimulated by recent legislative changes designed to remedy the most conspicuous abuses in this type of financing, banks and other financial institutions are again expanding their mortgage loans. The recent crisis made material available for a broad analysis of our experience with mortgage financing and for a formulation of fundamental credit standards designed to maintain sound conditions in the mortgage market. Immediate analysis of this material would be of incalculable value to our national economy as a whole as well as to the specific institutions that specialize in mortgage financing.

3. STANDARDS OF INVESTMENT CREDIT

The Committee recommends a third study along similar lines in the field of investment securities, especially those which are finding their way in increasing quantity into bank portfolios. Banks in this country hold large aggregates of savings deposits and have become accustomed, in consequence, to maintain investment portfolios of considerable size. At present, however, under the impetus of a large supply of loanable funds and a small demand for commercial loans, investment securities are fast becoming the predominant category among bank assets. This development has given rise to a considerable degree of apprehension on a variety of grounds. It is feared, for example, that an increase in the long term rate of interest may cause heavy depreciation in the market value of these portfolios, that the smooth functioning of the bond market may be upset by heavy sales by banks and other institutional investors in their desire to avoid this depreciation, and that banks in search of yields sufficient to meet operating costs are tending to lower the quality of their investment holdings. A comprehensive analysis of the extent to which these fears are justified is urgently needed. Information should be made available showing the quality of bonds in bank portfolios, and the extent to which these portfolios consist of long term bonds, whose market value would depreciate in a period of rising long term interest rates, as compared with bonds that are already close to their dates of maturity. In addition to information of this sort the behavior of various types and qualities of investment securities under diverse business and money market conditions should be analyzed. The data for such an analysis are ample, but they are in the portfolios of large institutional investors and in the files of organizations devoted to investment research. A penetrating study designed to reveal fundamental relationships in this area necessitates, consequently, the intimate cooperation of officials from both kinds of institution.

Composition and Behavior of Bank Deposits

Among other major research projects that have engaged its attention, the Committee wishes to endorse especially a detailed analysis of the composition, flow and behavior of deposits in our banks. This study is essential to an understanding of financial developments in recent years and as background material for some of the most important work now going forward in monetary theory. The influence of excessive or deficient reserves on the willingness of banks to expand their loans and investments has been analyzed extensively and ample data are available to measure fluctuations in the total volume of deposits in response to the availability of reserves. During the recent financial cataclysm, however, changes in the total volume of deposits did not always correspond to the availability of reserves. Moreover, the most important factors in the general credit situation were not always those which had to do with the availability of reserves; they were rather those that made for changes in the composition and activity of deposits as between different classes of depositors. The monetary effects of the stock

market collapse in 1929, for example, are not reflected in changes in reserves or in changes in total deposits, but rather are disclosed in the extent to which the repayment of brokers' loans resulted in a transfer of deposits from the balances of potential consumers, who were holding securities on margin, to those of business corporations, which had loaned surplus funds on the call market. To the extent to which this happened, the absence of change in the total volume of bank deposits during the autumn of 1929 concealed one of the important factors in the banking collapse, namely, that the purchasing power of consumers was being seriously depleted. During 1931 and 1932, furthermore, changes in the total volume of deposits failed to reflect the flow of frightened deposits from weak to strong banks, which preceded and helped to precipitate the banking collapse. Our information on debits or transfers of funds was also inadequate and failed to indicate the extent to which a low rate of deposit turnover reflected merely the general stagnation in the business situation as compared with the extent to which it represented a hoarding of purchasing power in the form of idle deposit balances. Since 1933 some studies have been made covering the rebuilding of deposit accounts, but the whole area is full of unknown factors and requires sharp illumination before sufficient data are available to our monetary authorities to afford the basis for a more careful formulation of monetary policies.

PROCEDURE TO EFFECTUATE RECOMMENDATIONS

In the event that this report meets the approval of the National Bureau of Economic Research,[1] the Committee recommends that it be submitted informally to a group composed of representatives of all those concerned with financial research: governmental agencies, private banking and financial institutions, foundations, and universities. The contacts made by the Committee in preparing the report have led it to believe that the response of these groups would be favorable to the program it has proposed. Should this belief prove justified, the Committee recommends that the officers of the National Bureau of Economic Research take such steps as seem indicated to secure the financing required and to provide for the organization recommended.

[1] The Executive Committee of the National Bureau unanimously approved the report on February 11, 1937 and directed its officers to take steps to make effective the program outlined in the report.

PART TWO

Types of Suggested Research Project Tentatively Drafted in Connection with The Committee's Exploratory Work

In Part One the early launching of several major research projects is urgently commended to the attention of the central staff in charge of the financial research program which the Committee proposes. These endorsed projects comprise:

1. A Comprehensive Survey of the Financial Structure
2. An Investigation of the Effects of Legislation and of Public Supervision of Credit
3. A Review of Credit Standards of Financial Institutions in the fields of: (a) Consumer Credit; (b) Real Estate Credit; (c) Investment Credit
4. A Study of the Composition and Behavior of Bank Deposits

Comprehensive in scope, each of these major research projects presents manifold aspects and problems demanding special inquiry and detailed investigation. Indeed, the accomplishment of the research objectives provisionally conceived by the Committee and expressed in its specific recommendations, requires the breaking down of each major research proposal into as many well defined and workable patterns as are expedient for assignment to the competent investigators who may be selected to undertake them and assume responsibility for their completion. This procedure, in fact, may be laid down as prerequisite to the fruitful execution of each of the Committee's research proposals and the successful consummation of the entire plan of financial research it recommends. Only upon the basis of the findings of many subordinate and correlative investigations, paralleling or following one another in orderly sequence, can we adequately reveal the anatomy of the whole financial structure and gain the comprehensive picture of financial organization that is so imperative. Only from many complementary inquiries, too, can the precise effects of financial legislation and public supervision upon credit facilities and the character of credit be finally ascertained; can the study of the credit experiences of financial institutions give rise to better credit procedures and standards and a body of generally applicable credit principles; can the further analysis of the composition and behavior of bank deposits lead to a deeper understanding of the significance of changes and variations

in deposit data. Summary and synthetic studies, building upon and drawing from these partial investigations, must ultimately take form, but these must await the availability of a rich and adequate body of basic research materials.

Taking for granted the inherent nature of the research process, the Committee has properly assumed that it is not bound by its special endorsement of a definite program of financial research to do more than indicate in its report the broad outlines of the research areas it considers highly important. The Committee, however, is fully conscious of the need for careful and painstaking planning of all phases of a given project recommended before any work is started. It has deliberately recognized this need by providing in its recommendations for the organization of a central staff on financial research under the National Bureau of Economic Research, whose primary function would be to formulate detailed research plans, including the determination of appropriate methods and techniques as well as the selection of qualified personnel. Greater elaboration of its proposals for the imminent launching of an active research program, the Committee believes, might hamper unduly the initiative and freedom of action which it is convinced the central staff must have.

In addition, the Committee wishes to reiterate that its program is continuing and hence much broader than its suggestions for immediate research might convey. If the entire program advocated by the Committee is to prove fertile and productive, it must be flexible and responsive to changing economic conditions and problems. It must be endowed with reserve capacity to initiate and undertake new projects in line with altered needs and changing problems. The Committee views the research proposals it recommends as meeting essential requirements for information in the current financial setting, but it also feels that they may serve to provide a foundation for later research that will inevitably build upon their data. In any case, the Committee is convinced that both the full development of its program and the requisite adaptations of its urgent research proposals must be assigned as a major mandate to the central staff.

In the course of its exploratory work the Committee received many suggestions of investigations that might be sponsored in conjunction with its scheme of financial research. Preliminary descriptions of several of the proposed projects were drafted for the Committee as examples of the type of inquiry falling within the compass of its program. Since these were originally prepared purely for its own use, the Committee hesitated to incorporate them in its report lest their inclusion be regarded as a commitment binding on the central staff. However, as they are strikingly effective for purposes of illustration, it has been deemed appropriate to present them here, with the reminder that they do not bear the stamp of the Committee's approval.

The particular purposes served by their presentation as a supplement to the main report merit brief enumeration. First, they exemplify one sort of activity to which the central staff would devote itself, namely, the formulation of well defined research projects and the outlining of definite research procedures. Second, the Committee's proposals of larger scope, as those calling for a comprehensive survey of the financial structure and for an exhaustive study of the composition and behavior of bank deposits, could be effectuated only by a series of smaller, complementary studies, dealing with special phases of these broad subjects. The project entitled, 'Changes in the Capital Requirements of Business Enterprise and the Decline of the Commercial Loan', for instance, is but an essential fragment of any far reaching survey of the anatomy of financial organization. Again, the project 'Major Factors in Fluctuations in Bank Deposits, 1929–1936' is merely a fragmentary study pertinent to the more exhaustive investigation of the composition and behavior of bank deposits. Other projects are listed that relate similarly to this recommendation of the Committee. Third, the project sketches dealing respectively with the consumer, investment and mortgage credit experience of banking institutions amplify in certain particulars the Committee's recommendations for a searching review of prevailing credit procedures and practices in these fields. Finally, several additional projects were drafted to illustrate other types of inquiry that might appropriately be sponsored under the Committee's program. These tentative project sketches are arranged in accordance with their relevance to the research plans advocated by the Committee.

Section A

Projects Related to the Committee's Research Recommendations

CHANGES IN THE CAPITAL REQUIREMENTS OF BUSINESS ENTERPRISE AND THE DECLINE OF THE COMMERCIAL LOAN

General Background

With the rapid growth of corporate cash balances and liquid assets during the 1920's, business borrowing from

banks declined relatively to other types of borrowing. Business loans apparently comprised between 50 and 60 per cent of bank portfolios in 1920; by 1929 they had declined to less than 40 per cent of earning assets; today they apparently constitute less than 20 per cent. Widely commented on by experts and viewed with concern and apprehension by active bankers, this manifest atrophy of business demands for banking accommodation has been variously explained from time to time. At first, emphasis was placed upon business reaction to the financial difficulties accompanying the post-War liquidation, the emergence of hand to mouth buying, improved inventory controls, self-finance, etc. When the relative decline persisted, authorities pointed to the easy capital market conditions and the speculative boom. With the advent of depression and widespread financial crisis, banking difficulties arising out of an inflexible and reputedly illiquid asset structure of banking institutions are said to have caused a shortage of bank credit to business and forced a liquidation of many outstanding business loans. More recently, the continued relative decline of business loans has been ascribed to the monetary and fiscal policies of the Federal government in conjunction with its widespread relief and recovery program as the primary short run explanation, while technological advances in methods of production and distribution, reducing the turnover period of business working capital, have been assigned as the underlying long run influences.

Whatever the merits of these various explanations of the relative decline of business loans from commercial banks, the theoretical and practical implications for the institutional structure and behavior of our financial system are far reaching indeed. What has been, for example, the change in the character of capital demands of business enterprise in the last two decades? On what other types of earning assets have commercial banks come to depend? Can our banking and credit system adapt itself to rely chiefly upon these other types of earning assets? To what technological and other economic forces may the decline in business demands for bank credit be attributed? Has the average turnover period for business working capital been materially shortened in many industries or has the shift to independence from short term debt been dictated by broader considerations rooted in the risks of large scale investment and the various influences affecting the continuity of corporate existence under shifting economic conditions? In what measure have special financing institutions operating with invested funds obviated the necessity that business enterprises finance through banks? To what extent have corporate enterprises with large cash balances assumed increasingly the burden of financing business customers, entering thereby into active competition with commercial banks in supplying working capital for the system at large? Finally, have alterations since 1933 in banking and financial laws governing the operations of banking institutions adequately taken into account changes in the character of demands for borrowed funds by business?

Specific Problems

Intimately related to the study of the behavior of corporate liquid funds, 1929–36, a separate investigation is proposed to deal with the progressive decline of commercial lending by banking institutions. As a specific point of attack, the financial statements of several hundred larger corporations reported in investment manuals would be intensively examined from 1920 to 1936, and analyzed with respect to the relationship of current assets to total assets, notes payable to current assets, inventories and current liabilities, cash and other liquid assets to current and total assets. These data should be classified by industry, size of corporation and in other meaningful ways. Supplementary quantitative data that reflect changes in the working capital and trends in commercial debt of medium and smaller size enterprises having a continuous existence for at least ten years could doubtless be obtained from the credit files of the Federal Reserve banks, the larger city banks, and various credit-rating agencies. In this phase of the inquiry the analyses by Lauchlin Currie and various investment agencies of tendencies in corporate financial practices would be useful.[1]

These facts assembled, the emphasis of the investigation would be shifted to technological changes, internal and external, affecting the working capital requirements of various industries. In this part of the study, among other things, capital turnover, including both total and working capital, would be estimated for those enterprises and industries for which data are adequate. Finally, the inquiry would: (1) study special finance companies, the sources of their capital and manner of operation, with a view to ascertaining how and in what degree their activities have contributed to the declining importance of the commercial loan; (2) examine changing techniques of financing current productive and distributive activities by large and highly integrated enterprises.

[1] Lauchlin Currie, "The Decline of the Commercial Loan," *Quarterly Journal of Economics*, August 1931, pp. 698–709.

MAJOR FACTORS IN FLUCTUATIONS IN BANK DEPOSITS, 1929–1936

General Background

Between 1929 and 1933 the volume of bank deposits belonging to the people of the country declined about 30 per cent. Simultaneously, prices of securities, including high grade bonds, collapsed. The factors responsible for this unparalleled collapse would under any circumstances merit the most careful evaluation. In this particular case, however, investigation must be especially painstaking, since the attendant circumstances were quite other than those which would be expected under ordinary banking and credit theory. Insufficiency of reserves, for example, which theoretically is considered by far the most important factor in deposit liquidation, was not important during this period.

Viewed from the assets side of the bank balance sheet, furthermore, the liquidation of security loans was the largest single factor in this decline, although both call and time loans on securities were freely available at exceptionally low rates throughout the period. The magnitude of the problem posed for theorists in money and banking is illustrated by contrasting the situation in the crisis of 1919–22 with that in 1929–33. In the former, a 6 per cent discount rate, maintained by the Federal Reserve banks over an exceptionally long period, and applicable to a volume of member bank borrowing equal to 150 per cent of their required reserves, resulted in an aggregate decline in deposits of about 10 per cent. During 1929–33, despite a quick drop in discount rates, a negligible volume of member bank borrowing, and a wide availability of excess reserves, the decrease in deposits amounted to 30 per cent.

Equally as challenging as the decline in available bank deposits from 1929 to 1933 is their subsequent rise of more than one-half from 1933 to 1936. Paralleling this rise, there occurred: (a) an unprecedented increase in banking reserves; (b) a sharp decline in interest rates; (c) a bond market boom; (d) a doubling of stock prices; (e) a relatively modest increase in commodity prices; (f) a gradual recovery in production and trade. Granting that extraordinary forces, precipitated by the emergencies of 1932–33 and leading to gigantic fiscal operations on the part of the Treasury as well as far reaching innovations in monetary organization and policy, dominated this rapid change in financial conditions, it still presents many significant angles for inquiry. Theoretically, this rapid growth of deposits should have induced simultaneously a veritable boom in production and trade, a rapid expansion of money incomes, a marked stimulation of capital formation from savings and from bank expansion, and a sharp and extended rise in commodity prices. Indeed, this presumably should have happened on the basis of orthodox theories as well as on those of more modern schools. Under classical theory, the sheer impact of a larger quantity of credit on the economic system should have had irresistible accelerating effects; under modern analysis, the primary and secondary impact of funds introduced into trade by governmental relief and public works expenditure should have found prompt expression in like effects.

This projected investigation can readily be divided into three parts. [1] The specific factors in the decline in deposits from 1929 to 1933 will be studied in the order of their relative importance, which appears to be: (a) bank failures, which account for about one-half of the total decline; (b) security loan liquidation, which accounts for perhaps a fourth more of the total decline; (c) contraction in other banking assets. With both the aggregate magnitude of these factors and their incidence in time from the final quarter of 1929 through the first quarter of 1933 determined, the inquiry would be directed to the specific factors to which bank failures are attributable. In this phase the work of the Federal Reserve Committee on Group, Branch and Chain Banking would be helpful. In addition, however, three aspects of the problem not adequately covered in those reports should be analyzed carefully: (a) the extent to which failures were due to assets regarded as substandard, (b) the extent to which pressure on banks arose from regional deficiencies of funds reflecting deficiencies in the balance of payments, (c) the incidence of hoarding and the importance of transfers of 'smart money' from banks in difficulty to more solvent institutions. Finally, the extent to which pressure on the bond market arose from sales of securities by open banks should be compared with the liquidation of bonds by receivers of closed banks.

[2] In a similar way the basing point for the second part of the project would be the relative importance of specific factors in the increase in deposits subsequent to 1933: (a) the reorganization of banking facilities and the rehabilitation of banking capital with the aid of the Reconstruction Finance Corporation; (b) dishoarding of currency by the public with the reestablishment of financial confidence; (c) the inflow of gold from abroad following dollar devaluation and concomitant foreign political disturbance; (d) the expansion of Treasury currency in consequence of the silver purchase program; (e) the growth of the Federal debt and its considerable absorp-

tion into bank assets; (f) the divergent movements of other elements of bank assets. With these data assembled, investigation would concentrate on the financial aspects of the Federal recovery and relief program and the Treasury operations necessitated by it. Borrowing operations of the Treasury and the movement of its balances would be studied intensively. The disbursement of funds in connection with various phases of the recovery and relief program, and the activities of various Federal agencies, would be carefully traced and related to the movement and activity of deposits in different economic areas and for different classes of banks. Deposit data collected by the Board of Governors of the Federal Reserve System in connection with its study of bank reserves from 1924 to 1935 would prove of immense value for this part of the project, and some use might be made of the large deposit survey, recently concluded.

[3] These two parts of the project completed, it should be possible to trace effectively the sequence of events from 1929 through 1935 with greater detail and authority and to evaluate: (a) the relative efficiency of the almost innumerable measures taken to combat the crisis and promote recovery; (b) the extent to which our financial system should be reorganized further to stabilize bank deposits or bring them under better control. An indication of the limitations to which much of prevailing banking and credit theory is subject when viewed against an adequate factual setting should also be possible.

EFFECT OF BROKERS' LOAN LIQUIDATION IN THE FINAL QUARTER OF 1929 ON CONSUMERS' BALANCES OR INCOME DEPOSITS

General Background

Although speculative phenomena exhibit a close correlation with fluctuations in business activity, their causal interrelationships are still highly obscure. In general, economists have been content to hold that speculative activity primarily reflects business conditions and is not a causal influence of any appreciable magnitude in the volume and activity of business itself. The extent to which such causal relationships do exist, however, requires thorough exploration.

Specific Problem

Among the various problems in this field that might be selected as a point of departure, the relationship of the collapse in security values in the final quarter of 1929 to the volume of *consumers' deposit balances* appears by far the most promising. We know that the aggregate borrowings of brokers who were members of the New York Stock Exchange declined from $8,549,000,000 on September 30, 1929, to $3,990,000,000 on December 31—a decrease of $4,559,000,000 in three months. We know, furthermore, that this decline occurred largely because the collapse in stock prices initiated an automatic calling of margins which forced persons holding stocks on margin to transfer their available cash to New York to prevent liquidation of their securities. Consumers' balances at that time must therefore have been deflated throughout the country in great volume.

Although many economists ascribe major importance in business fluctuations to changes of this character in consumers' balances, relatively little analysis has been devoted to the effects of this particular episode where, from surface indications, these changes probably occurred on a wider scale than at any other time in modern financial history. Mr. Hawtrey, for example, who treats business fluctuations primarily as a credit phenomenon and who traces its effects largely in terms of the effects that changes in consumers' balances exert on consumers' outlays for commodities, discusses this particular episode as not constituting a case in point because practically the entire decrease in brokers' borrowings was reflected in a decline of loans from non-banking lenders, and had little effect upon the aggregate of bank deposits. Mr. Keynes, who views changes in *income deposits* as an extremely important factor in business fluctuations, likewise treats this episode, not as a deflation of *income deposits*, but rather as an example of the liquidation of a speculative 'bear' position against a speculative 'bull' position.

To determine the facts we must ascertain the location and distribution of deposits during the final quarter of 1929. If the liquidation of brokers' loans was entirely at the expense of consumers' balances or income deposits, the investigation would show: (1) no great change in the general ownership of securities, (2) a decrease of some 4½ billion dollars in consumers' deposits during the period offset by a growth of approximately the same amount in the deposit balances of corporations previously lending in the call money market. If, on the contrary, there was no depletion of consumers' balances, the investigation would show: (1) a distribution of deposits essentially unchanged as to ownership during the period, (2) a transfer in the ownership of securities from individuals in debt to brokers at the beginning of the period to those who had been lending funds to brokers. Since all these phenomena were probably happening simultaneously, the aim of the investigation should be to determine their relative importance.

ORIGIN, LOCATION AND MOVEMENT OF CORPORATE CASH BALANCES, 1929–1936

General Background

The appearance during the 1920's of great bodies of free funds at the disposition of corporate management has given rise to new problems in banking and credit (the theoretical implications of which are relatively unexplored). Our basic theory of banking and credit was worked out at a time when the aggregate of capital funds at the disposal of business enterprise was commonly insufficient to finance full operating demands, and the deficiency was borrowed as a matter of course from banks on the basis of short term commercial loans. Under these conditions, fluctuations in the aggregate volume of business deposits closely reflected actual needs for working balances, and the specific banks in which these balances were located were determined by the necessity of maintaining close credit relationships with lending banks as well as by needs for convenient points of disbursement. Since the middle 1920's this picture has become progressively less characteristic of many large and dominant business enterprises.

Smarting under the memory of the difficulties that arose during the commodity price decline in 1920–21, American business managements in many cases decided to maintain themselves in the future as free from current short term commercial debt as possible, and, during the prosperity that followed, succeeded not only in eliminating in large part their current debt, but in addition, in piling up huge floating cash balances greatly in excess of current needs. As a result, during 1929 at a time when business transactions exceeded in volume anything previously experienced, American business was able not only to finance these huge totals without great increase in its commercial borrowing, but in addition to spare a further huge volume of funds for loans in the call market. In 1931, 1932 and 1933 many of these balances were still in existence despite the heavy losses of the depression, and by their large, sudden and erratic movements from bank to bank in search of safety, contributed considerably to the general insecurity of the banks in the period prior to the bank holiday. Data recently disclosed indicate that cash and other liquid assets of business corporations are again increasing and stand today only slightly below their pre-depression peak.

Specific Problem

Study of this problem may begin with the origin and subsequent movement of that body of funds generally known as 'Loans to Brokers for the Account of Others'. It is proposed that a group of the more important corporate lenders of funds on the Stock Exchange in 1929 be studied intensively.[1] From the point of view of their corporate ownership, it would be necessary to determine the business setting out of which the possession of large free balances arose. This would entail analysis of their earnings record, dividend practices, capital securities flotations, and their depreciation reserve policies. The appearance of the balances having been accounted for in their historical setting, it would next be necessary to study their behavior year by year, including the extent to which they were invested in other securities, the conditions under which they were loaned on the call market, and the extent to which and conditions under which they were deposited in banks. It would be especially illuminating to ascertain to what extent they were placed on time deposit in 1930 when returns on open market money rates fell below the time deposit rate, and to what extent their transfer from interior banks to urban centers contributed to the wave of bank failures that accompanied the departure of Great Britain from the gold standard in September 1931. Lastly, it would be pertinent to follow closely the behavior of these corporate cash balances and associated liquid assets during the recovery.

SECTION B

Projects Amplifying the Specific Research Recommendations of the Committee

FINANCING THE CONSUMER AND ITS RELATION TO COMMERCIAL BANKING

General Background

In the decade following 1920 instalment finance companies, personal finance companies, credit unions, etc., emerged in increasing number to meet the ever widening demands for consumer and personal credit accommodation. Commercial banks at first viewed with indifference the rise of special institutions to finance the consumer. Gradually, however, they became more and more involved themselves in financing individuals as a result of: (1) receding local demands of business enterprise for working capital accommodation; (2) the phenomenal growth of instalment and other consumer finance institutions necessitating their recourse to bank borrowing; (3) expanding demands on the part of bank customers to

[1] Without, of course, disclosing names.

finance personal consumption needs, including home financing, as well as to provide funds for supplementing personal investment activities. Here and there banks recognized the necessity of developing special routines to deal with consumer lending, especially for customers of small means. In isolated instances, this recognition found expression in the establishment of personal loan departments.

The depression and accompanying repercussions upon business and investment market credit requirements heightened interest in consumer financing. From 1929 to 1931 personal loan departments of banks increased from 65 to 277; during the ensuing two years of distress a number of them were discontinued. More recently, commercial banking interest in the consumer credit field has again revived, owing chiefly to: (1) the notable recovery of cash resources in the hands of banks, variously caused; (2) the failure of expanding demands for business and investment credit accommodation to keep pace with capacity for meeting demands; (3) the unprecedented levels to which yields of available assets for bank portfolios have fallen in consequence, creating an acute problem of subsistence earnings for banking institutions generally; (4) the excellent record of consumer loans during depression. An additional influence, doubtless of considerable importance, has been the encouragement to consumer financing given by various Federal agencies, notably the Federal Housing Administration in its efforts to promote and popularize insured modernization credits as a boon to construction activity.

Specific Problem

This study would deal with the extent to which commercial banking activity today is concerned with consumer and personal finance, whether primarily the consequence of cumulative banking tendencies of the last twenty years or of the force of present and imminent circumstances. The significance of more adequate factual knowledge on this matter for basic theories of banking and credit, national credit policies, and practical problems and philosophies of bank administration is self-evident.

To facilitate quantitative treatment and analysis of trends a more satisfactory concept and effective definition of the area of consumer finance would have to be developed. The next step would be an anatomical description of the institutional organization of consumer finance facilities with the particular objective of indicating more accurately the interrelationships of commercial banks with specialized consumer finance agencies and the extent to which commercial banks themselves finance consumers. This would require an intensive study of the financial statements of the more important consumer credit agencies, and a cooperative appraisal of loan portfolios of a selected sample of banks in different areas with a view to ascertaining their consumer credit commitments. Current studies of the loan portfolios of closed and active banks in western states would afford supplementary evidence.[1] Should Federal Reserve authorities decide to require the classification of loans in economic as well as purely financial categories in future call reports of banks, reference data of immense value to this study would be made available.

In this general setting, the investigation would be directed to the lending experience of consumer credit agencies over the last ten years or more, and particularly during the depression. It is believed that a wealth of data might be assembled from the following sources: (1) the larger instalment companies; (2) personal and industrial finance companies and the Morris Plan banks; (3) banks with established personal loan departments; (4) other banks that have recently made special studies of their personal loan experience; (5) the internal records of the Federal Housing Administration, which contain a complete description of each insured modernization loan made under the Federal Housing Act. On the basis of these data the relationship of consumer and personal debt to individual income, occupation, and other relevant factors of economic status would be intensively studied for repaid loans and loss loans. Such an analysis should not only yield results of immense practical value for those engaged in consumer finance, but also provide a more adequate basis for appraising the penetration of commercial banks into this field of activity and for evaluating the role of consumer credit as a factor accentuating economic instability.

A final phase of this investigation would involve an examination of state and national legislation bearing on consumer financing as in one way or another affecting the personal lending activities of consumer finance agencies and commercial banks. This would necessitate special consideration of usury and other laws limiting charges on this type of lending and the various practices of consumer finance institutions and banks under those laws. It would also require attention to administrative and other costs entailed in such lending. Data bearing on costs would have to be obtained from consumer credit agencies directly and from banks that have made extensive studies of lending costs.

[1] For example, the studies of F. L. Garlock of the Bureau of Agricultural Economics, covering Arkansas, Utah and Wisconsin.

THE INVESTMENT EXPERIENCE OF BANKS IN SELECTED CITIES, 1926–1936

General Background

The liquidity and soundness of banking institutions today is primarily dependent on the quality or soundness of the investment assets held. Though this condition is not entirely new in American banking, still it does present aspects that are unique, for the dependence on investment assets is far greater than at any other time. It remains to be established, moreover, that a stable and effective unit banking system can be continuously maintained if the investment account constitutes the bulk of earnings assets.

The following facts serve to illustrate the preponderant importance of investment assets in the contemporary banking situation. Approximately 60 per cent of the earnings assets of all commercial banks in the United States were investment assets on June 30, 1936, in contrast with about 28 per cent in 1929. Excluding notes and bills of the Federal government, the percentage is reduced to 42 as a rough measure of the relative importance of the long term investment account. Even if we ignore all direct obligations of the Federal government, the percentage of investment assests was still 26. If loans on securities are included with investment assets as an indication of the total dependence on investment market assets, the percentage becomes 71.

Perspective on the present importance of investment assets may also be gained by viewing their relative importance as a source of earnings. Prior to 1929 interest and dividends on investments accounted for approximately one-fourth of the earnings from this source of all member banks, though investments constituted a somewhat higher proportion of assets. After 1929, and throughout the depression and recovery, investment income has constituted an increasing share of interest earnings, reflecting both the liquidation of loan accounts and a tendency among banks to hold a greater volume of investments as earnings assets. In 1935 the source of nearly half of member bank interest income was the investment account. During the years of deepest depression, active member banks apparently lost more from write-downs and losses on investment portfolios than on customers' loans, while in the subsequent upswing the appreciation of security holdings has been the source of the bulk of recoveries on loans and securities.

Specific Problem

The crucial importance of investment income for banks today, the importance of investments in total earning assets, and the record of apparent losses for this type of asset, amply justify a study of the investment experience of banks over a period of years. Paralleling a projected study of mortgage experience, this investigation would differ only with respect to the kind of assets covered. Data drawn from the investment records of a number of banks in selected cities and surrounding localities would constitute the working materials for analysis. For each bank cooperating it would be highly instructive to obtain supplementary detail on general investment policies and practices pursued at various times over the period surveyed. Among the useful facts would be information bearing on: (1) the direct expenses of administering investments; (2) the personnel and facilities of investment departments; (3) the extent to which various investment services and those of investment counselors are used and relied on; (4) the nature of other sources of investment advice.

These data assembled, the various investment accounts should be analyzed with respect to quality of security holdings, maturities, marketability, diversification, etc., and the shifts in and activity of bank bond accounts from time to time. The Comptroller's ruling of February 15, 1936, concerning the purchase and sale of investment securities by national banks, issued under the authority of the Banking Act of 1935, would constitute an effective reference base from which this analysis might proceed. The yield fluctuations and the price movements of bonds of different classes, grades and maturities over the entire period and also of investment losses and recoveries, would be studied intensively. The calculation of quality indexes for the investment accounts of separate institutions would be essential to a comparative analysis of banks of different types.

It is proposed that the examination and research divisions of the Board of Governors of the Federal Reserve System and the Federal Deposit Insurance Corporation be urged to make, concurrently with this inquiry, an independent investigation of the investment portfolios of selected member and insured banks as included in examination reports. Such an investigation would provide additional data and at the same time supply an independent analysis and set of conclusions as a check and supplement to the analysis and conclusions of the direct inquiry. Moreover, it should be possible to cover a longer time span in an investigation using examination records than in one using data provided directly by banks.

MORTGAGE LOAN EXPERIENCE OF BANKS IN SELECTED CITIES, 1925–1936

General Background

Since 1920 real estate loans have constituted an increasing proportion of bank loans to customers. Marked differences characterized this development in urban and rural banks, in national and state banks, and in different geographical areas. For banks as a whole, however, mortgage assets came to constitute a progressively more important source of earnings. Slow moving and of limited marketability, they became embarrassing assets as delinquencies and foreclosures mounted from 1929 to 1933. Even so and despite some reduction in the figures of bank holdings during the depression, largely due to write-offs and bank closings rather than liquidation, such assets constitute practically as large a portion of total earning assets as in 1929, approximately 9 per cent. Moreover, they constitute about 22 per cent of customers' loans as against 13 per cent in 1929. As a result of recent modifications of bankings laws, far reaching reforms of real estate financing practice, efforts of the Federal Housing Administration and other agencies to liquefy the mortgage market, and restricted opportunities for bank lending, it is a strong probability that banks generally will increase their mortgage advances in the future.

Specific Problem

In view of these considerations there is urgent need for more adequate quantitative information on the extent and nature of risk incurred in mortgage lending by banks. The object of the project here proposed is to assemble primary data based upon the mortgage loan records of active banks, and to ascertain precisely what the experience of banking institutions has been over ten or more years with this type of lending. Materials for the investigation would have to be obtained directly from a group of banks known to have engaged most actively in this field of operations. Coverage should naturally include large as well as small banks; national, state member and nonmember banks, savings banks, building and loan associations, and a satisfactory regional representation.

SECTION C

Other Illustrative Projects

PROJECTED STUDIES OF BANK EARNINGS AND EXPENSES

EARNINGS of banks must consistently cover expenses if an effective and stable system of banking facilities is to be maintained. From 1922 to 1933 an increasing number of banks failed to preserve the necessary balance between income and outgo, at least a balance adequate to absorb losses, and were consequently compelled to discontinue operations. During the drastic liquidation following 1929 banks generally suffered severe losses which had to be charged off against current earnings, reserves and capital. Even so, the allowances made for losses were admittedly insufficient. In the sweeping banking reorganization of 1933 stringent measures of capital rehabilitation had to be taken in all too many cases. Furthermore, as earning and expense reports for the last two years attest, unabsorbed losses in considerable volume were carried forward for adjustment under more favorable conditions.

Despite a general improvement in banking conditions, reflecting the effects of various monetary policies, banking reforms, widespread business recovery and a phenomenal growth of deposits, the difficulty of balancing income and outgo for many banks has been only moderately alleviated. Earnings have been seriously affected by declining interest yields on marketable assets which banks have come to hold in increasing volume. In addition, slack demands for business and personal accommodation have confronted banks everywhere, and progressive concessions on interest charges to borrowers have been forced. While operating expenses have been severely reduced, thanks to the elimination of interest on demand deposits by law and Federal regulation of interest paid on time deposits, considerable resistance to further reduction apparently exists. As suggested above, moreover, some past losses remain to be absorbed, and reserves for future contingencies provided. This current struggle of banking institutions to cover their expenses out of earnings and to rehabilitate their capital and reserves imperatively challenges analysis, both by those interested in the practical side of banking and by banking theorists.

Published Data on Bank Earnings and Expenses

Data on bank earnings and expenses are made available from several sources. In general they consist of aggregates of earning and expense items of banks reporting to the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation and several state banking departments. The data on national banks provided by the Comptroller are subdivided by states and reserve cities; those published by the Board of Governors of the Federal Reserve System are subdivided by national and state member banks and by Federal Reserve districts; and those supplied by the Federal Deposit Insurance Corporation are subdivided by all

insured state banks and all insured non-member banks. For 1934 and 1935 the Federal Deposit Insurance Corporation has presented a breakdown of earnings and expenses by size of deposit classes for insured state banks, member and non-member. In addition, the Board of Governors of the Federal Reserve System has recently released a comparable analysis for member banks, and the Comptroller has published similar data for national banks by principal geographic areas and Federal Reserve districts. Supplementing these data, significant operating ratios based on the composite earning and expense records and also broken down by size classes, have been published. Regional analyses are published by the Federal Reserve Banks of Boston, Dallas, Chicago, Cleveland, New York and Philadelphia, and data are available for a few individual states, as Kansas, Iowa, Georgia, Mississippi, for several years as a result of the cooperative efforts of the state banking department and the state bankers' association. Data for Kansas and Iowa are accessible for a longer period than for other states where the reporting of state bank earnings and expenses is relatively recent. The Kansas data, for example, run back as far as 1900; the Iowa data are available from 1924.

Adequacy of Data for Research Purposes

Published data on bank earnings and expenses are insufficient as raw materials for exhaustive statistical treatment. Since they are aggregates of earnings and expenses for groups and classes of banks, it is obvious that the variety of statistical combinations and manipulations grounded on them must necessarily be restricted, and that the range of highly significant questions on banking conditions and tendencies that can be answered by them is narrowly circumscribed.

Notwithstanding these limitations, the data do furnish a basis for certain types of study. Analyzed over a period of years, for example, they may disclose major tendencies in bank earnings and expenses, for national and state member banks as a group, and subdivided by states and regions. For one thing, they are probably adequate for tracing the rise in interest on bank deposits which proved so embarrassing a feature of banking practice when crisis commenced to envelop the entire financial system in 1931. State bank data, where available, are useful for comparisons of state non-member bank earnings and expenses with those of member banks. In addition, national bank statistics afford materials for relating earning and expense trends as between reserve city banks and country banks. Provided that unpublished compilations of various banking authorities are accessible, differences in the course of earnings and expenses as between large and small banks may be traced. Local or statewide studies of bank earnings or expenses, as those under the auspices of bankers' associations, may supply corroborative evidence for the interpretation of trends.

In view of the limited extent and usefulness of the data as described, the possibilities for fruitful investigation of the many problems of bank earnings and expenses do not appear numerous. This judgment, however, is warranted only if supplementary facts are not obtainable. The files of the several public banking authorities would constitute one important source for additional facts; the records of banking institutions themselves another. Recent research activities sponsored by various bankers' associations, as well as the cooperation extended by individual bankers to independent inquiries in different parts of the country, testify to an eagerness on the part of many bankers to facilitate disinterested investigation of banking problems.

Types of Proposed Study

Against this general background, the following two related studies dealing with different aspects of bank earnings and expenses are proposed:

1. Trends and current tendencies in the earnings and expenses of active banks, 1920–1936;
2. Significant earning and expense relationships of a representative sample of banks for selected years, 1926–1936 (an intensive statistical analysis).

TRENDS AND CURRENT TENDENCIES IN THE EARNINGS AND EXPENSES OF BANKS, 1920–1936

General Background

Contemporary tendencies in bank earnings and expenses reflect the play of unparalleled financial influences as well as the repercussions of far reaching legislative reform affecting the entire financial system. They also reflect, however, the conditioning force of many other elements largely accumulated out of the past and best described as long run. In part, these other elements are a matter of internal form, practice and organization developed over a period of years to facilitate the performance of accepted functions within the limits set by banking statute and regulative administration. But they issue also from the external relationships of banks, individually and as a system, with debtors and creditors, relationships only slowly and gradually developed from long and continuous banking operations. Any attempt to appraise and evaluate impartially prevailing earning and expense problems of banks requires as a background an adequate knowledge of previous trends and tendencies,

together with such interpretation of conditioning influences as historical data make possible. Unfortunately, no single published source exists from which a satisfactory background can readily be obtained. This particular study, therefore, is designed to fill such a gap.

Specific Problem

Drawing largely from published information on bank earnings and expenses and such unpublished material as may properly be provided by Federal and state banking authorities, this study would sift and combine available data in as many meaningful ways as practicable. Among the various possibilities for treatment are: (1) a detailed study of the rise in interest on deposits as an expense item and the relative significance of deposit interest at different periods; (2) comparisons of important earning and expense items with a view to determining their relative variability over a period; (3) comparisons of important earning and expense items with series reflective of external conditions affecting bank operations; (4) comparisons of trends and tendencies of national bank earnings and expenses with those of state member banks and, where data make it possible, with non-member banks; (5) comparisons of aggregate national and member bank earnings and expenses in different regions, states, and centers of activity. To the extent possible, in addition, trends should be analyzed on the basis of size classes. Materials assembled for the Federal Reserve Committee on Branch, Chain and Group Banking would be extremely useful in all phases of the project.

SIGNIFICANT EARNING AND EXPENSE RELATIONSHIPS OF A REPRESENTATIVE SAMPLE OF ACTIVE BANKS FOR SELECTED YEARS, 1926–1936

General Background

Studies of bank earnings and expenses according to size of bank have been handicapped by the nature of available data and the restrictions these data have imposed on the methods applicable in analysis. In general, they have tended to show that medium size and small banks typically have had higher expenses per $100 of loans and investments and per $100 of invested capital than larger banks. These results are significant so far as they go, but they do not afford support for inferences concerning the net operating effectiveness of any class of bank. For this purpose, a much more intensive analysis of bank earning and expense data is required, showing, for example, the relationship of high or low net earnings and net deficits to capitalization, to composition of assets, to various items of earnings and expenses, and to losses and recoveries. Moreover, these relationships must be studied by type of bank, as well as size, with especial regard to the factors that are internal and controllable by bank management and those that are external and beyond such control.

Specific Problem

A project is therefore proposed on these neglected aspects of bank earnings and expenses. For this purpose, individual bank income and expense reports for specified years are needed. So far as possible the sample should be representative of commercial banks, as a whole, as judged by several criteria, e. g., the regional and urban distribution of banking facilities, the distribution of banks by incorporation, capital and deposit size. With these data in hand accepted frequency and correlation techniques should be applied to disclose significant relationships. Among the possibilities immediately suggesting themselves are the relationships between high net profits, low net profits or net deficits and region or place of operation, composition of assets and liabilities, composition of earnings and expenses, type of banking charter and Federal Reserve membership, losses and recoveries. On the basis of this completed analysis, it should be possible (1) to draw more adequate quantitative inferences than heretofore respecting the factors accounting for high earnings, low earnings or deficits, by type and size of bank; (2) to isolate more effectively the elements of earnings and expenses controllable by bank managements from those that are external and largely beyond control. The effects of widespread banking reorganization and of adjustments in capital structures since 1933 would be another matter with which this investigation should deal.

CHARACTERISTICS OF BANKING UNITS AND THE AVAILABILITY OF BANKING FACILITIES

Background

In retrospect most banking authorities agree that the fundamental weakness of the American banking structure, when the crisis of 1929–33 broke over it, was an excess of banking units and facilities. A persistent run of bank failures from 1922 to 1929 and a creeping concentration movement, manifesting itself in bank mergers, branch, chain and group banking, had diminished this surplus. Nevertheless, an excess of banking facilities remained the notable feature of the banking structure. As a matter of fact, banking laws, both Federal and

state, which condition and determine that structure, were specifically framed with a view to preserving this feature. Differences in intent and effectiveness characterized banking law in different parts of the country, but did not materially alter the banking situation as a whole.

The disastrous run of bank failures precipitated by the crisis of 1929–33, the sweeping reorganization of banking facilities in 1933 and since, definitely changed the complexion of the problem from one of excess to one of dearth of facilities. Successive measures have been taken to remedy this condition, and changes in banking laws, moderately favorable to banking concentration, have raised banking standards; banking authorities have moved slowly in licensing closed banks and chartering new ones; potentialities for banking profits have not been such as widely to attract new banking capital. Just as the prior surplus of banking facilities varied in economic and geographic regions, in urban and rural centers, so the present dearth is more acute in some areas and centers than in others.

Specific Problem

Public officials responsible for administering public policies of banking organization and active bankers interested in perfecting the banking structure are confronted with complex and difficult questions when they deal with the many aspects of the adequacy of banking facilities. Among the conspicuous gaps in materials available for their use in the absence of fully assembled and analyzed factual data that would: (1) suggest the minimum operating standards necessary for banks of different types and sizes in order to assure survival under average management and business conditions; (2) disclose the nature and sources of economies open to banks of different classes as well as identify the distinctive banking costs that may characterize banks of given types and sizes: (3) indicate the most effective composition of assets in relation to capital and deposit liabilities from the standpoint of profitability and capacity to withstand the tensions of variable business conditions; (4) provide a basis for judging the most effective size of banking unit in terms of community needs for credit and deposit facilities and of survival capacity of banks.

A research project designed to fill this important gap must be primarily analytical in approach and method. For this reason, it is proposed that the collection and assembly of new data essential for its conduct be made the special or collateral task of subsidiary and related studies independently undertaken in connection with the National Bureau's general research program in the field of financial organization, as for example, the proposed studies in the area of bank earnings and expenses. Such studies should be planned with an eye to the factual requirements of this investigation and be related ultimately to it at all stages.

There need be no delay in launching this study, however, because of any dependence on associated projects to provide working data. Some materials are already in existence and others are currently being collected in the course of special studies by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation and several state banking departments. Much pertinent information could only be obtained in accordance with specific needs directly from banking institutions and from Federal and state bank supervisory authorities.

The steps to be taken in this research and out of which it would take shape and direction are, tentatively:

[1] A thorough survey of the findings of various banking investigations with the double purpose (a) of discovering clues and leads for further research, and (b) of developing a setting and historical background;

[2] An intensive study of: (a) bank failures by size and location of bank; (b) the causes of bank failures as disclosed by the reports of the Federal Reserve Committee on Branch, Group and Chain Banking, by recent investigations of the Board of Governors of the Federal Reserve System and the Federal Deposit Insurance Corporation, by other official inquiries, and by studies of bank failures sponsored by state bankers' associations;

[3] A special analysis of bank earning and expense data by type and size of bank, based on materials provided by the preceding project, to determine why some banks of special types and within different size classes earn more than others;

[4] A special investigation of the extent of capital impairment, as a result of the crisis of 1929–33, among size classes and by charter and membership status in cooperation with the Comptroller's office, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation and Reconstruction Finance Corporation.

[5] A parallel investigation of banking reorganizations and adjustments in capital structures of banks during 1933–35, by type and size of bank.

[6] A primary inquiry into the nature and sources of banking economies open to banks of different classes, together with a companion study of distinctive banking costs that characterize certain types and sizes of bank, based mainly on information gathered directly from banking institutions.

[7] An evaluation of the effects of varying economic conditions under which banks operate on the character of their activities, earnings and expenses, loss experience, etc., based largely on the findings of bank type studies recently completed or now in process, and also on studies of state banking developments sponsored by several state bankers' associations.

Officers

JOSEPH H. WILLITS, Chairman
GEORGE SOULE, President
DAVID FRIDAY, Vice-President
SHEPARD MORGAN, Treasurer
JOSEPH H. WILLITS, Executive Director
CHARLES A. BLISS, Executive Secretary
MARTHA ANDERSON, Editor

Directors at Large

CHESTER I. BARNARD, *President, New Jersey Bell Telephone Company*
HENRY S. DENNISON, *Dennison Manufacturing Company*
GEORGE M. HARRISON, *President, Brotherhood of Railway and Steamship Clerks*
OSWALD W. KNAUTH, *President, Associated Dry Goods Corporation*
HARRY W. LAIDLER, *Executive Director, The League for Industrial Democracy*
L. C. MARSHALL, *Johns Hopkins University*
GEORGE O. MAY, *Price, Waterhouse and Company*
SHEPARD MORGAN, *Vice-President, Chase National Bank*
BEARDSLEY RUML, *Treasurer, R. H. Macy and Company*
GEORGE SOULE, *Director, The Labor Bureau, Inc.*
N. I. STONE, *Industrial and Financial Consultant*

Directors by University Appointment

WILLIAM L. CRUM, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors Appointed by Other Organizations

FREDERICK M. FEIKER, *American Engineering Council*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
WINFIELD W. RIEFLER, *American Statistical Association*
GEORGE E. ROBERTS, *American Bankers Association*
MALCOLM MUIR, *National Publishers Association*
MATTHEW WOLL, *American Federation of Labor*

Research Staff

WESLEY C. MITCHELL, Director
ARTHUR F. BURNS
SOLOMON FABRICANT
SIMON KUZNETS
FREDERICK R. MACAULAY
FREDERICK C. MILLS
LEO WOLMAN
EUGEN ALTSCHUL, DAVID L. WICKENS, Associates

FOR THE convenience of our *Bulletin* subscribers we are republishing herewith The Report of the Exploratory Committee on Financial Research. The Report in book form may be obtained from the National Bureau for $1.00. The Inventory of Current Research on Financial Problems, Part Three of this Report, is in press (250 pp., $1.50).

National Bureau of Economic Research

BULLETIN 65

SEPTEMBER 15, 1937

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

X9 (D1).72.N

Non-Farm Residential Construction, 1920-1936

Copyright 1937, National Bureau of Economic Research, Inc.

DAVID L. WICKENS and RAY R. FOSTER

RESIDENTIAL construction has at last started to revive in the United States after a decade of decline. For several years, particularly from 1932 through 1934, the depression was so severe that practically no new construction was undertaken. Not until 1936 did residential building reach significant proportions. General economic recovery has now advanced sufficiently to lead many families to consider investing in houses.

During the period of active construction in the 1920's, current statistical measures of building then available, not only were restricted primarily to indicating the areas in which activity was especially marked, but also showed conflicting trends. There was no accurate yardstick by which to gauge the relative total importance of the construction industry in the national economy, and measures of its wide ramifications, from the manufacture of building materials to real estate finance and investment, in various parts of the country, were even less adequate. The severe depression following 1929 provided evidence of the basic importance of construction to the economic well-being of the nation as a whole. It also emphasized the peculiar character of construction among American industries, as an aggregate of many local industries, whose prosperity is dependent in considerable part upon local conditions.

Notwithstanding the unfortunate results of being uninformed in the crucial years of the latest period of marked activity in construction, we have continued to suffer from the absence of comprehensive data on residential building and the lack of adequate regional analyses. In view of the renewed activity in building now evident in many American communities, it is important that reliable statistical measures be widely available. Without them it will be difficult to gauge the significance of building booms, and any efforts to control wide variations in activity in the construction industry will continue to be handicapped by lack of information. In an effort to meet the need for such data and as a part of a broad project for the study of real estate financing and economic stability being conducted by the National Bureau of Economic Research, new estimates of the volume and value of non-farm residential construction in the United States from 1920 through 1936 are presented in this *Bulletin*. These estimates are based upon building permits[1] rather than building contracts. Instead of following the method most widely used heretofore of raising the amount of contracts reported for a group of states by an arbitrary percentage to account for states not reported, the present estimates make use of ratios of the number of dwelling units built to the increase in number of families in representative cities, which ratios were applied (with appropriate adjustments) to the increase in number of families in areas not covered by data on building permits, to obtain the total number of dwelling units built. Separate estimates of the volume of building were made for large metropolitan centers, for their suburbs, for smaller urban centers, and for villages and unincorporated areas, within each geographic region. The aggregate value of the dwellings built was obtained by multiplying the estimated number of dwelling units by the corresponding average costs per unit in each class of city.

The methods used in making these estimates, described in greater detail in Section II, were, of necessity adapted to the data available. Accordingly, they are presented as approximations, subject to the limitations imposed by the deficiencies of the data themselves.

I

New housing accommodations supplied for the United States during the decade of the 1920's totaled approximately

[1]Special acknowledgment is due the United States Bureau of Labor Statistics for the use of its building permit data, and particularly to Herman Byer, Chief, Division of Construction and Public Employment, for making available numerous special tabulations.

TABLE 1
NEW RESIDENTIAL BUILDING IN THE UNITED STATES OTHER THAN ON FARMS, ESTIMATED VOLUME, 1920-1936

YEAR	NUMBER OF NEW DWELLING UNITS CONSTRUCTED (*thousands*)	VALUE OF ALL RESIDENTIAL CONSTRUCTION[1] (*millions of dollars*)
1920	247	1,122
1921	449	1,841
1922	716	3,115
1923	871	3,980
1924	893	4,244
1925	937	4,754
1926	849	4,314
1927	810	4,064
1928	753	3,813
1929	509	2,623
1930	286	1,456
1931	212	1,005
1932	74	282
1933	54	204
1934	55	214
1935	144	585
1936	282	1,202

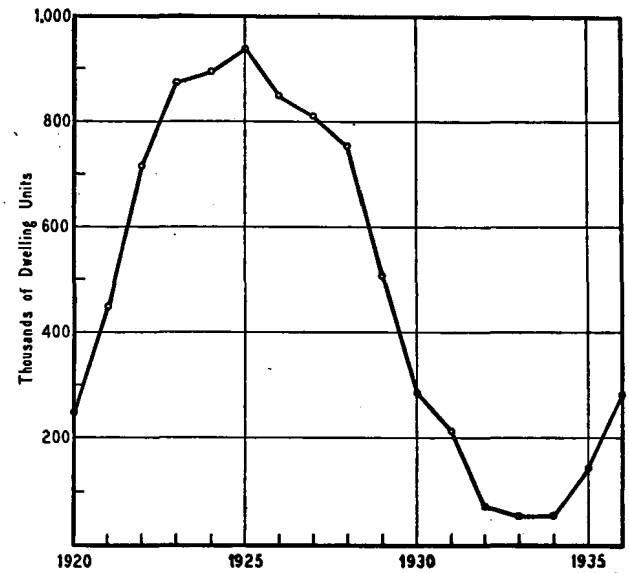
[1]Including non-housekeeping dwellings (hotels, clubs and lodging houses).

7,000,000 dwelling units[2] in houses, apartments, housekeeping units, and flats. This means that on the average about 700,000 families were provided for each year. At the crest of this wave of building in 1925, over 900,000 units were constructed. At the trough, in 1933 and 1934, about 54,000 dwelling units were built. For 1936, estimates indicate that over 280,000 units were constructed, more than five times as many as in 1933, but only 40 per cent of the average of the 1920's (Chart 1 and Table 1). If the ten-year average of 700,000 units built from 1920 to 1929 is used as a base from which to measure, the extremes of the fluctuations are marked by a growth from 35 per cent of the average in 1920 to 133 per cent in 1925, a fall to 8 per cent in 1933, and a renewed rise to 40 per cent in 1936.

The nation's annual expenditures for its new residential structures fluctuate in general with the number built. However, over a period of years, the sum expended per unit varies with changes in prices of materials and wage rates, as well as with changes in contractors' margins, and financing costs. New styles in housing, which have popularized more elaborate fixtures and equipment of all kinds, have tended to make building more expensive, although this is partly offset by a gradual reduction in the average size of new dwelling units. More general provision for plumbing, heating, lighting, and especially for better cooling and refrigeration, has raised the cost of all housing.

[2]In these estimates, a dwelling unit is that part of a structure originally intended for the occupancy of a single family as living quarters. All data in this *Bulletin* refer to non-farm residential buildings.

Chart 1
NUMBER OF NEW DWELLING UNITS BUILT
1920-1936



For apartments, services and facilities have become more elaborate. Changes in average cost per dwelling unit are discussed further below.

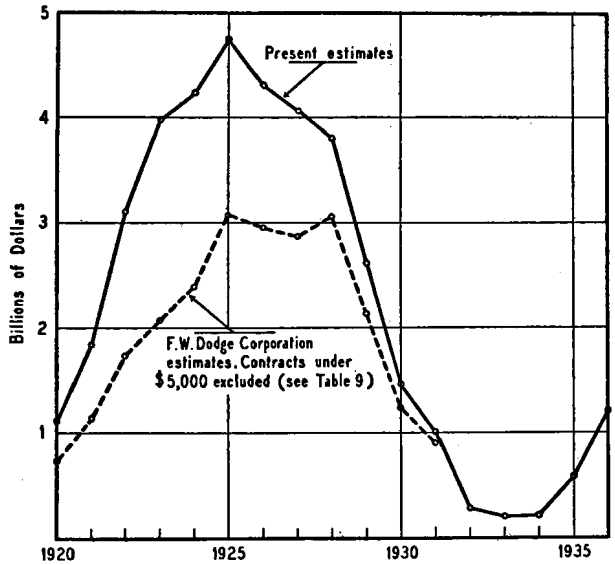
For the decade of the 1920's aggregate expenditures for the construction of residences totaled 34 billion dollars, or an annual average of 3.4 billion dollars. Annual totals range from one billion in 1920 to nearly 5 billion in 1925, and only one-quarter billion in 1933 and 1934. These figures do not include the value of the land. Based upon the average for the decade of the 1920's as 100, the value of new building in 1920 was 33 per cent, in 1925, 141 per cent, in 1933, 6 per cent, and in 1936, 35 per cent or about the 1920 level (Table 1 and Chart 2, Curve A). Fluctuations as great as these in the largest branch of the construction industry have serious repercussions on production and employment in many related industries, as well as on financial institutions and on the general prosperity of the country.

COMPARISON WITH OTHER ESTIMATES: VALUE

The present estimates of the value of new residential construction are substantially higher than those previously available, especially for years prior to 1928. For 1922-26, as shown by Curve A, Chart 2, they are from 50 to 100 per cent higher than estimates of the F. W. Dodge Corporation (Curve B). However, the latter covered only contracts over $5,000.[3] Thus, the difference between Curves

[3]The value of all contracts for new buildings under $5,000 was estimated by the F. W. Dodge Corporation to be $871,000,000 in 1928 and $740,000,000 in 1929. Many of these projects under $5,000 were residential buildings.

Chart 2
VALUE OF NEW RESIDENTIAL CONSTRUCTION, 1920-1936, COMPARED WITH PREVIOUS ESTIMATES



A and B is, to a considerable extent, an indicator of the volume of new dwellings costing less than $5,000 each, although part of the difference may be due to changes in coverage of the contracts data in earlier years. These points are discussed further in the Appendix. Estimates of the Federal Employment Stabilization Board for 1925-32, based on F. W. Dodge contracts data for 37 states, are practically the same as the F. W. Dodge estimates for 48 states (see Table 9).

COMPARISON WITH OTHER ESTIMATES: NUMBER OF DWELLING UNITS

Although estimates of the aggregate value of residential construction annually over a period of years have been available for some time, similar estimates of the total number of dwelling units built have been published only recently. In addition to the estimates in this *Bulletin,* which were presented in preliminary form at the December 28, 1936 meeting of the American Statistical Association,[4] estimates of the number of dwelling units built annually since 1920 have been published by the Brookings Institution,[5] and for 1915-36 by Lowell J. Chawner of the United States Bureau of Foreign and Domestic Commerce.[6] The Brookings and Chawner series are based largely on building permit data, and the totals for the country as a whole have the same general year-to-year trend as the estimates in this *Bulletin,* though differing in method of derivation.

[4] *Journal of the American Statistical Association,* March 1937, p. 97.
[5] *The Recovery Problem in the United States* (1937), pp. 183-8.
[6] *The Annals* (American Academy of Political and Social Science), March 1937, Vol. 190, p. 25.

Notice of completion of a report " . . . embodying a series of estimates on housing construction during the years 1920-36 . . . " by the Federal Housing Administration was made in the *Journal of the American Statistical Association,* March 1937, p. 150. This series also was based on building permits. The data for the several years cited are in general agreement with those of the other estimates discussed above.

TURNING POINT IN RESIDENTIAL CONSTRUCTION IN 1925

The present estimates indicate that residential construction was at its peak in 1925. This is a departure from the view widely held heretofore. Both building permits and contracts awarded—the data on residential building currently available in the 1920's—indicated a decline in residential building in 1926 and 1927. In 1928 building permits declined further, while contracts were reported as increasing to a level slightly higher than the 1925 peak. Largely on the basis of the trend of these reported contracts, 1928 has heretofore been generally accepted as the last high point in residential construction, and it has been a general impression that the decline in this industry preceded by only a short period the decline in general business activity.[7] From the present estimates it appears that resi-

[7] That the turning point occurred in 1925 rather than in 1928 is confirmed by data on shipments of materials used in residential building such as bathtubs, lavatories and kitchen sinks (see Chart 11 and discussion in Section II).

Chart 3
NUMBER OF NEW DWELLING UNITS BUILT, BY TYPE OF DWELLING 1920-1936

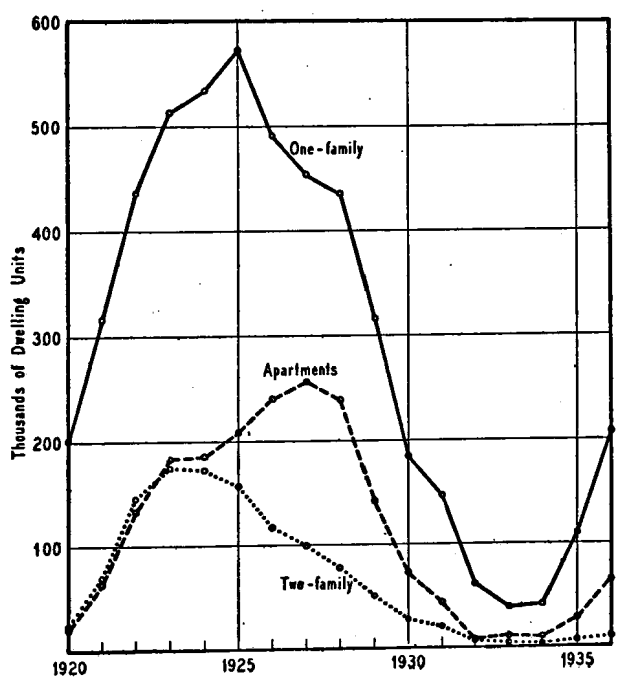


TABLE 2

NUMBER AND DISTRIBUTION OF NEW NON-FARM DWELLING UNITS BUILT, BY TYPE OF DWELLING AND BY PERIOD, 1920-1936

(absolute numbers in thousands of dwelling units)

	1920-1924	*1925-1929*	*1930-1936*	*1920-1936*
One-family	2,001	2,270	791	5,062
Two-family	589	501	77	1,167
Apartments	586	1,088	239	1,913
Total	3,176	3,859	1,107	8,142
		(percentage distribution)		
One-family	63.0	58.8	71.5	62.2
Two-family	18.6	13.0	6.9	14.3
Apartments	18.4	28.2	21.6	23.5
Total	100.0	100.0	100.0	100.0

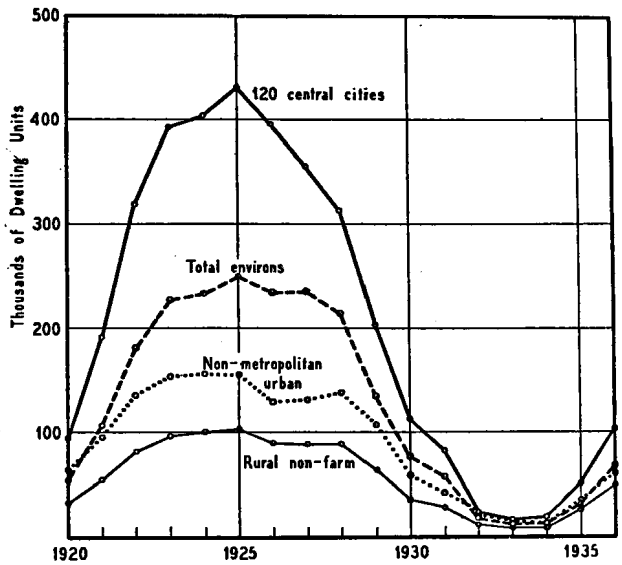
dential building began to decline four years before the marked industrial decline in 1929, and that the rate of fall was somewhat faster than was generally recognized at that time.

TYPE OF STRUCTURE

Although residential building for the country as a whole reached its peak in 1925, the national totals obscure widely different turning points for the various types of dwelling. One-family dwellings usually are the first to be constructed after a long period in which little building has been done. This was true in 1920-24, following the War period during which there had been little private construction. It is also true at present, although the proportion of apartments constructed in 1936 was greater than in 1935. During the general rise in building activity in the early 1920's, single-

Chart 4

NUMBER OF NEW DWELLING UNITS BUILT BY CLASS OF CITY 1920-1936



family houses were built in increasing number until 1925, then declined. The course of construction of two-family houses and apartments was quite different. The former reached a maximum as early as 1923 or 1924, whereas apartment building continued up to a maximum in 1927 and was the last to decline. During the 1930's two-family houses

TABLE 3

NEW NON-FARM DWELLING UNITS BUILT, ESTIMATED NUMBER, 1920-1936

(thousands of dwelling units)

	1920	*1921*	*1922*	*1923*	*1924*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*
							'A'—Type of Dwelling										
One-family	202	316	437	513	534	572	491	454	436	316	185	147	61	39	42	110	207
Two-family	24	70	146	175	173	157	117	99	78	51	28	21	6	4	3	6	10
Apartments	21	63	133	183	186	208	241	257	239	142	73	44	7	11	10	28	65
Total	247	449	716	871	893	937	849	810	753	509	286	212	74	54	55	144	282
							'B'—Class of City										
1. 120 central cities	95	192	319	393	404	431	396	355	313	203	113	83	24	17	19	51	104
2. Environs: 2,500 and over	36	71	120	152	156	166	156	157	143	90	53	38	12	9	8	20	40
3. Environs: under 2,500	18	35	60	75	77	82	77	78	71	45	26	20	6	5	5	12	27
4. Total environs (2+3)	54	106	180	227	233	249	234	235	214	135	77	58	18	13	13	32	68
5. 96 metropolitan districts (1+4)	150	299	499	620	637	680	629	590	528	338	190	140	42	31	33	83	172
6. Non-metropolitan urban	64	96	135	153	156	155	129	131	138	107	59	43	20	14	13	35	61
7. Total urban (5+6)	214	395	633	773	793	835	759	721	665	445	249	184	62	45	46	118	232
8. Rural non-farm	33	55	82	97	100	103	90	89	88	64	36	28	12	9	9	26	50
9. Total non-farm (7+8)	247	449	716	871	893	937	849	810	753	509	286	212	74	54	55	144	282
							'C'—Geographic Division										
New England	11	20	37	45	53	60	45	44	45	28	15	14	5	4	3	4	10
Middle Atlantic	44	101	187	233	249	255	255	257	218	128	84	67	19	14	19	35	67
East North Central	50	74	134	181	191	192	186	178	160	110	37	19	5	3	4	17	37
West North Central	20	35	52	63	53	60	45	35	36	30	16	15	6	4	4	9	13
South Atlantic	37	57	83	91	106	118	101	85	81	49	29	29	13	9	9	36	58
East South Central	8	19	29	37	42	46	39	37	39	24	12	6	3	2	2	6	20
West South Central	33	56	66	66	59	64	56	63	68	59	37	24	8	7	6	16	32
Mountain	6	13	17	15	17	19	14	14	14	14	8	6	2	1	1	3	6
Pacific	38	74	111	140	123	123	108	97	92	67	48	32	13	10	7	18	39
Total	247	449	716	871	893	937	849	810	753	509	286	212	74	54	55	144	282

TABLE 4

DISTRIBUTION OF THE NUMBER OF NEW NON-FARM DWELLING UNITS BUILT, BY CLASS OF CITY AND BY PERIOD, 1920-1936

	NUMBER-THOUSANDS			PERCENTAGE DISTRIBUTION		
	1920-29	*1930-36*	*1920-36*	*1920-29*	*1930-36*	*1920-36*
120 central cities	3,102	411	3,513	44.1	37.1	43.1
Environs	1,867	280	2,147	26.5	25.3	26.4
Non-metropolitan urban	1,263	244	1,507	18.0	22.1	18.5
Rural non-farm[1]	803	171	974	11.4	15.5	12.0
Total non-farm	7,035	1,106	8,141	100.0	100.0	100.0

[1]Excludes rural towns, and villages (under 2,500 population) and unincorporated areas in environs of metropolitan districts, considered as urban.

have been much less commonly constructed than in earlier periods (see Chart 3).

Apartments require more elaborate financing and are usually built as investments. Building activity as a whole must be well under way and a broad demand for housing must be evident before such large multiple-unit structures are launched. Once they are begun, however, the financing and construction of others are likely to follow. Certain features of this type of building make its market less sensitive to consumer demand. The larger size, longer construction-time, and indirect financing all make for overbuilding once an active period of construction has begun.

In the country as a whole, more one-family dwelling units are built than any other type. During the last seventeen years they have constituted 62 per cent of the aggregate number of dwelling units built. Apartments are next in importance, with 24 per cent, and two-family dwellings last, with 14 per cent of the total. The proportions have shifted from time to time, as is shown in Table 2, which summarizes the number of units provided in different types of dwelling for several periods. Estimates of the number of dwelling units built each year since 1920 classified by type of dwelling are presented in Table 3, A, and Chart 3.

BUILDING ACTIVITY PREDOMINANTLY IN METROPOLITAN AREAS

Residential building during 1920-36 was predominantly concentrated in large metropolitan cities and their environs (see Chart 4). When residential construction for the period is classified by type of population center (Table 4), it appears that about 70 per cent was concentrated in the 96 metropolitan districts.[8] Of this 70 per cent, over half, or 43 per cent was concentrated in the 120 central cities of these metropolitan districts. The environs of the metropolitan cities were next in importance with over 26 per cent, although they averaged only 17 per cent of non-farm population. The rural non-farm areas (towns and villages under 2,500 and unincorporated areas not farms) had the lowest building rate, accounting for only 12 per cent of the total volume of building, although they had nearly 20 per cent of total population. These differences emphasize the importance of the rate of growth of population, as opposed to the total population as a determinant of building volume: the outskirts of the cities grew in population more than twice as fast as the entire country on the average during the decade 1920-29, while the rural non-farm areas grew less than any group of urban centers.

Building in the metropolitan areas shifted continuously from the large cities to the suburbs during most of the

[8]A metropolitan district is defined by the Bureau of the Census as an "area within which the conditions of manufacturing, trade, transportation, labor, and living—in brief, the daily economic and social life are predominantly influenced by the central city." There are 96 districts most of which are in the northeastern part of the country. Each district has 100,000 or more population and includes not only a central city but also all the adjoining or nearby smaller cities and towns that constitute a part of the same urban area. For example, the Metropolitan District of Philadelphia in 1930 included not only Philadelphia city proper, containing 128 square miles and a population of 1,950,000, but also an area outside the city extending into four counties in Pennsylvania and three in New Jersey, covering 866 square miles and containing a population of 896,000.

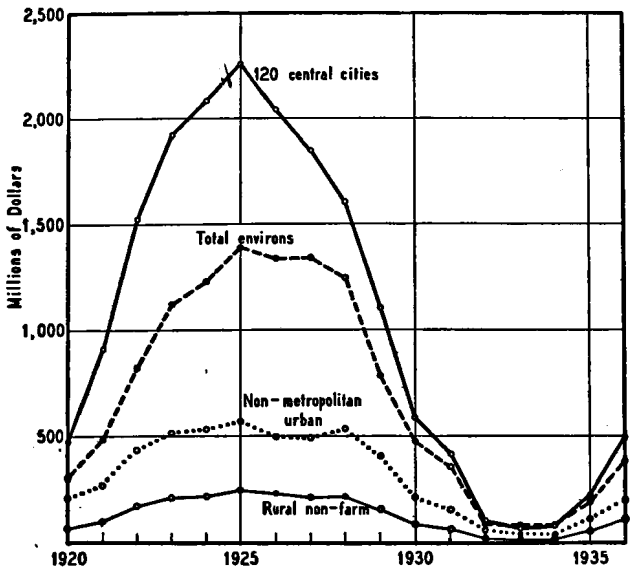
TABLE 5

DISTRIBUTION OF VALUE OF NEW NON-FARM RESIDENTIAL BUILDING, BY CLASS OF CITY AND BY PERIOD, 1920-1936[1]

	AGGREGATE VALUE (*millions of dollars*)			PERCENTAGE DISTRIBUTION		
	1920-29	*1930-36*	*1920-36*	*1920-29*	*1930-36*	*1920-36*
120 central cities	15,789	1,975	17,764	49.0	41.0	48.0
Environs	10,077	1,657	11,734	31.3	34.4	31.7
Non-metropolitan urban	4,457	812	5,269	13.9	16.8	14.2
Rural-non-farm	1,876	375	2,251	5.8	7.8	6.1
Total non-farm	32,199	4,819	37,018	100.0	100.0	100.0

[1]Housekeeping units only.

Chart 5
VALUE OF NEW DWELLING UNITS BUILT BY CLASS OF CITY 1920-1936



period, as shown by the estimated number of new family units built each year since 1920 (Table 3, B). During the depression this movement extended into the rural non-farm areas. Building in non-metropolitan centers, that is those places not in metropolitan districts and above 2,500 in population, fluctuated less violently than in the metropolitan areas, and in recent years has been a larger proportion of the total than formerly. The majority of these non-metropolitan cities are in predominantly agricultural regions.

VALUE OF NEW RESIDENTIAL CONSTRUCTION, BY CLASS OF CITY

The value of new residential construction in the respective classes of cities is distributed in much the same way as the number of units. Value of new housekeeping units built in the metropolitan districts accounted for 80 per cent of the total during the seventeen years (see Table 5), as compared with 70 per cent of the total number of units. The value of dwellings built in the several groups of cities each year since 1920 is shown in Chart 5 and Table 6.

Between the different classes of cities there are wide differences in the average costs of new dwelling units built. For example, unit costs in the urban environs, i.e., places of more than 2,500 in population in environs of large cities, averaged from two to three times as high as costs in the rural non-farm areas (Chart 6).

Although the cost of building materials declined from 1920 to 1929 and fell much more rapidly during the depression, the average cost of dwelling units built in central cities changed little. In the other groups of cities average costs per unit built increased from 1920 to 1929, but declined during the depression. During 1933-35 average dwelling costs in the urban environs appear to have been higher than in the period of active building in the 1920's. Among the causes for these differences is the relatively lower average cost of all new units built in the urban environs in the 1920's because a larger proportion consisted of apartments and two-family dwellings, for which the cost per unit averages lower than for one-family dwellings. During the depression, building of apartments and two-family dwellings declined sharply in the urban environs, and a greater proportion of the small amount of construction done in those areas took the form of relatively expensive one-family dwellings.

REGIONAL DIFFERENCES IN BUILDING ACTIVITY

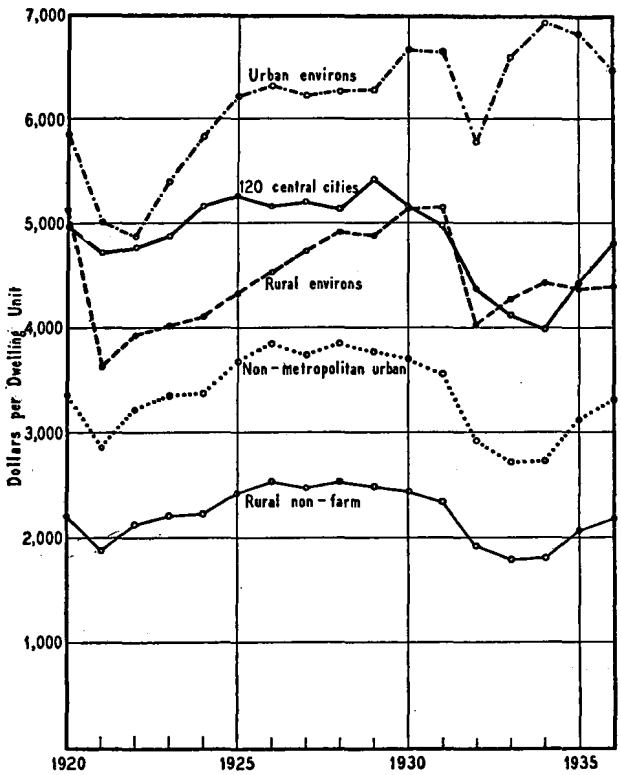
Construction of new residences is essentially a local industry even though some of or all the materials may come from long distances. Local demand for new housing accommodation depends not only upon the change in the population already settled in the area but also on factors that lead people to move from one part of the country to another—trade, industry, education, recreation. In the past, immigration has also been an important factor in determining the location and character of new construction. Replacements have been of minor importance in the total housing demand.

TABLE 6

NEW NON-FARM RESIDENTIAL BUILDING, ESTIMATED AGGREGATE VALUE, BY CLASS OF CITY, 1920-1936
(*millions of dollars*)

	1920	*1921*	*1922*	*1923*	*1924*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*
HOUSEKEEPING UNITS ONLY																	
1. 120 central cities	475	910	1,524	1,924	2,086	2,263	2,043	1,851	1,612	1,102	585	412	106	71	77	225	499
2. Environs: 2,500 and over	213	356	589	821	911	1,036	989	978	899	569	345	254	68	57	58	139	261
3. Environs: under 2,500	92	128	235	301	316	356	351	368	348	219	132	102	25	21	21	53	120
4. Total environs (2+3)	305	484	824	1,122	1,228	1,392	1,340	1,347	1,248	787	477	356	93	78	80	192	381
5. 96 metropolitan districts (1+4)	780	1,394	2,348	3,046	3,314	3,655	3,383	3,198	2,859	1,889	1,063	768	199	149	157	417	881
6. Non-metropolitan urban	214	274	434	513	528	570	499	492	530	404	218	153	57	38	36	109	200
7. Total urban (5+6)	994	1,668	2,782	3,559	3,842	4,225	3,882	3,689	3,389	2,293	1,280	921	256	187	193	526	1,081
8. Rural non-farm	74	104	175	216	223	250	230	221	223	160	89	66	23	16	17	54	109
9. Total non-farm (7+8)	1,068	1,771	2,957	3,775	4,065	4,475	4,112	3,910	3,613	2,453	1,369	987	279	203	210	580	1,191
NON-HOUSEKEEPING UNITS	54	70	157	206	179	279	202	154	200	171	86	17	3	2	3	5	11
TOTAL NEW RESIDENTIAL	1,122	1,841	3,115	3,980	4,244	4,754	4,314	4,064	3,813	2,623	1,456	1,005	282	204	214	585	1,202

Chart 6
AVERAGE COST OF CONSTRUCTION PER DWELLING UNIT, BY CLASS OF CITY 1920-1936



A large proportion of the residential building during the period covered by these estimates was concentrated in relatively small sections of the country. More than half of the total number of family units were built in the industrial northeast, while three-fourths were in the three areas represented by that area and the seaboard cities of the South Atlantic and Pacific regions. In 1920-36 more families were provided for in the Middle Atlantic states than in any of the other nine geographic areas. Building in New York City accounted for nearly one-half of new construction in this region. The East North Central states, including Ohio, Indiana, Illinois, Wisconsin and Michigan, were second in volume of activity, and the Pacific states third (see Table 7 and Chart 7).

The importance of population movements to new building is illustrated by the wide differences in the west and east coast areas during 1920-29. The Pacific states, in which the non-farm population averaged 7 per cent of the United States total, built nearly 14 per cent of all the new residences constructed during the decade, reflecting an increase of 55 per cent in the area's population. In contrast, the New England region, which had about 9 per cent of the population, accounted for less than 6 per cent of total building, the population having increased only 12 per cent.

TABLE 7
PERCENTAGE DISTRIBUTION OF NEW NON-FARM DWELLING UNITS BUILT, BY GEOGRAPHIC DIVISION AND BY PERIOD, 1920-1936

	Percentages of total number		
	1920-1929	*1930-1936*	*1920-1936*
New England	5.5	5.0	5.4
Middle Atlantic	27.4	27.6	27.4
East North Central	20.7	11.0	19.4
West North Central	6.1	6.0	6.1
South Atlantic	11.5	16.5	12.2
East South Central	4.6	4.6	4.6
West South Central	8.4	11.8	8.8
Mountain	2.0	2.4	2.1
Pacific	13.8	15.1	14.0
Total	100.0	100.0	100.0

The aggregate volume of building during the 1920's and early 1930's varied considerably between regions. In both periods the Middle Atlantic states held the same relative position, with 27 per cent of the total. The East North Central states, which had 21 per cent of the building in the 1920's, had only 11 per cent in the 1930's. The Pacific area had 14 and 15 per cent respectively, while the proportion in the South Atlantic area increased from 11 to 16 per cent. The striking drop in the relative position of the East North Central states during the 1930's was due largely to the almost complete cessation of building in Chicago, Detroit and Cleveland during the depression.

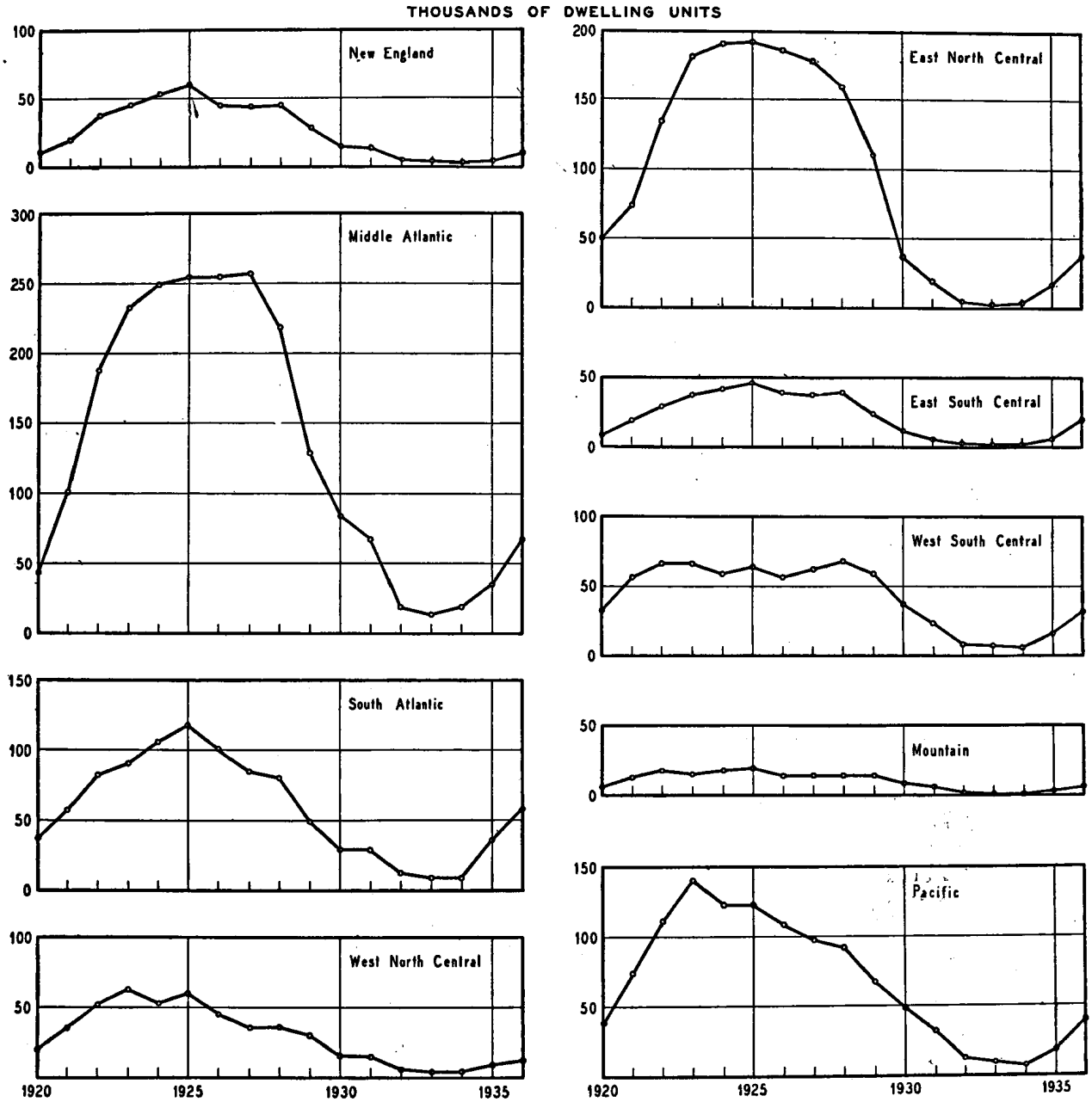
The timing of active building in various localities has differed so widely during the last seventeen years that its discussion in terms of *the* construction industry in the United States as a whole is often misleading, since it implies that the operations are those of a single industry rather than of many widely scattered industries that operate independently. For example, while the estimated total of residential construction for the country reached a peak in 1925, construction in the Pacific states was at its height two years earlier. From 1923 to 1934 it declined almost continuously. Building in the Middle Atlantic region increased from 1920 to 1927, not beginning its decline until four years later than in the Pacific region and two years after that for the nation as a whole (see Table 3, C and Chart 7).

RESIDENTIAL CONSTRUCTION IN INDIVIDUAL CITIES

Individual cities show much more irregular variations in building activity than the geographic regions. These wide differences in the general trend and in the year-to-year changes in home construction are illustrated by the record of twenty-five cities given in Chart 8, showing the number of families provided for by residential building permits obtained annually from 1920 to 1936. The influences on construction in individual cities are as diverse as local eco-

Chart 7

NUMBER OF NEW DWELLING UNITS BUILT, BY GEOGRAPHIC DIVISIONS 1920 — 1936



nomic conditions. The building booms of Miami and Los Angeles are notable examples of great local activity, little related to construction elsewhere. In Miami about 1,000 dwelling units were built in 1922; at the peak in 1924-25 nearly 10,000 units were built each year; and by 1928 there was practically no construction. At present, building is again active in Miami, about 2,000 units having been constructed in 1936. The Los Angeles boom reached a peak in 1923 with 44,000 units, declined to 20,000 by 1926, and to 2,000 by 1934. This decline was more gradual because of the diversity of industrial activity there. Now Los Angeles is again building at a rapid rate, with 9,000 units in 1936, and a rate in 1937 among the highest in the country.

Oklahoma City reached a building peak in 1929, reflecting the development of oil fields in that territory, declined to nearly zero in 1933-34, and in 1936 regained a level equal to its average for the 1920's. Washington, D. C. attained a building peak in 1925-26 with about 8,000 units per year, declined to 1,000 in 1933, and rose to 6,500 in 1936, approaching the former peak.

LONG TERM COMPARISONS OF RESIDENTIAL BUILDING VOLUME

Limitations of the data available for earlier years make it impossible to extend the present detailed estimates to years preceding 1920. However, some comparison of building during the last seventeen years and earlier years is possible. Residential contracts awarded in from twenty-five to twenty-seven eastern states during 1915-19, apartment construction in New York City since 1902, building permits as reported by Dun and Bradstreet and the United States Geological Survey, and other series indicate that the increase in building in the early 1920's was the continuation of a movement that started from a low level in all regions in 1918. The maximum volume of residential building was attained from five to nine years later, in individual regions. Fifteen years later, in 1933, building was again at low levels in all parts of the country.

While building permits compiled prior to 1920 do not segregate home building from other types, residential construction was a sufficiently large part of the total to make possible reasonably accurate deductions concerning its volume and trend. In many of the large eastern cities building rose sharply in 1919 but declined in 1920, largely owing to the effect of extremely high costs. However on the West Coast and in parts of the South there was little or no interruption to the increase in either physical or dollar volume from 1918 until 1922-23.

The available data indicate that the range of fluctuations in total building from the low in 1918 to the peak in 1925 and again down to the extremely low levels of 1933-34 was greater than in any previous period.[9] The fluctuations on a dollar volume basis were considerably greater than in the number of units built, largely because of the changes in building costs. In terms of the total number of dwelling units built the average level of building in the 1920's was higher than in earlier periods for several reasons: the increase in the number of non-farm families to be housed during 1920-30 was 5½ million as compared with 3½ to 4 million in the preceding two decades, and approximately 2½ million during 1890-1900. Building to replace losses was probably higher in 1920-30 than in earlier periods owing partly to the increasing average age of dwellings, but largely because of the rapid rate of demolition of structures with some remaining years of usefulness, to make way for other buildings. Also, owing to the curtailment of residential building during the War, a housing shortage had developed. The additional building thus required during the 1920's would normally have occurred during the preceding decade. The shortage was eliminated and an excess of units was built in many areas by 1930. All these factors contributed to the high average level of building during the 1920's, and together with changes in family income levels, ability to finance, and other factors, tended to increase greatly the amplitude of fluctuations in residential building[10] since the War.

II

It has not been possible to include in this *Bulletin* the extensive tables and considerable body of supporting data necessary to present the detailed methods used in obtaining the estimates summarized in Section I. These data will later be published separately. Consequently, the statement of method is confined to an outline of the principal steps involved:

1. Examination of the sample data for representativeness;
2. Estimate of the aggregate number of non-farm dwelling units built during the decade 1920-29 inclusive, in detail by geographic division, class of city, and type of dwelling;
3. Estimate of the number of dwelling units built each year since 1920, based on the relationships found in 2, and other data;
4. Estimate of the value of new residential building each year since 1920, by applying average costs per dwelling unit to the estimated number of units built.

REPRESENTATIVENESS OF PERMIT DATA

The present estimates are based primarily on reported building permits for principal cities of the United States as published by the Bureau of Labor Statistics since 1920,[11] in connection with data on change in number of families. The number of cities reporting building permit data has ranged from 189 in 1920 to 1,689 in 1936. Throughout most of the period 1920-32 each of the reporting cities had a popu-

[9] See J. R. Riggleman, 'Building Cycles in the United States, 1875-1932', *Journal of the American Statistical Association*, June 1933; Carl Snyder, *Business Cycles and Business Measurements* (Macmillan, 1927); W. H. Newman, *The Building Industry and Business Cycles* (University of Chicago Press), Vol. V, No. 4, July 1935; Homer Hoyt, *One Hundred Years of Land Values in Chicago* (University of Chicago Press, 1933).

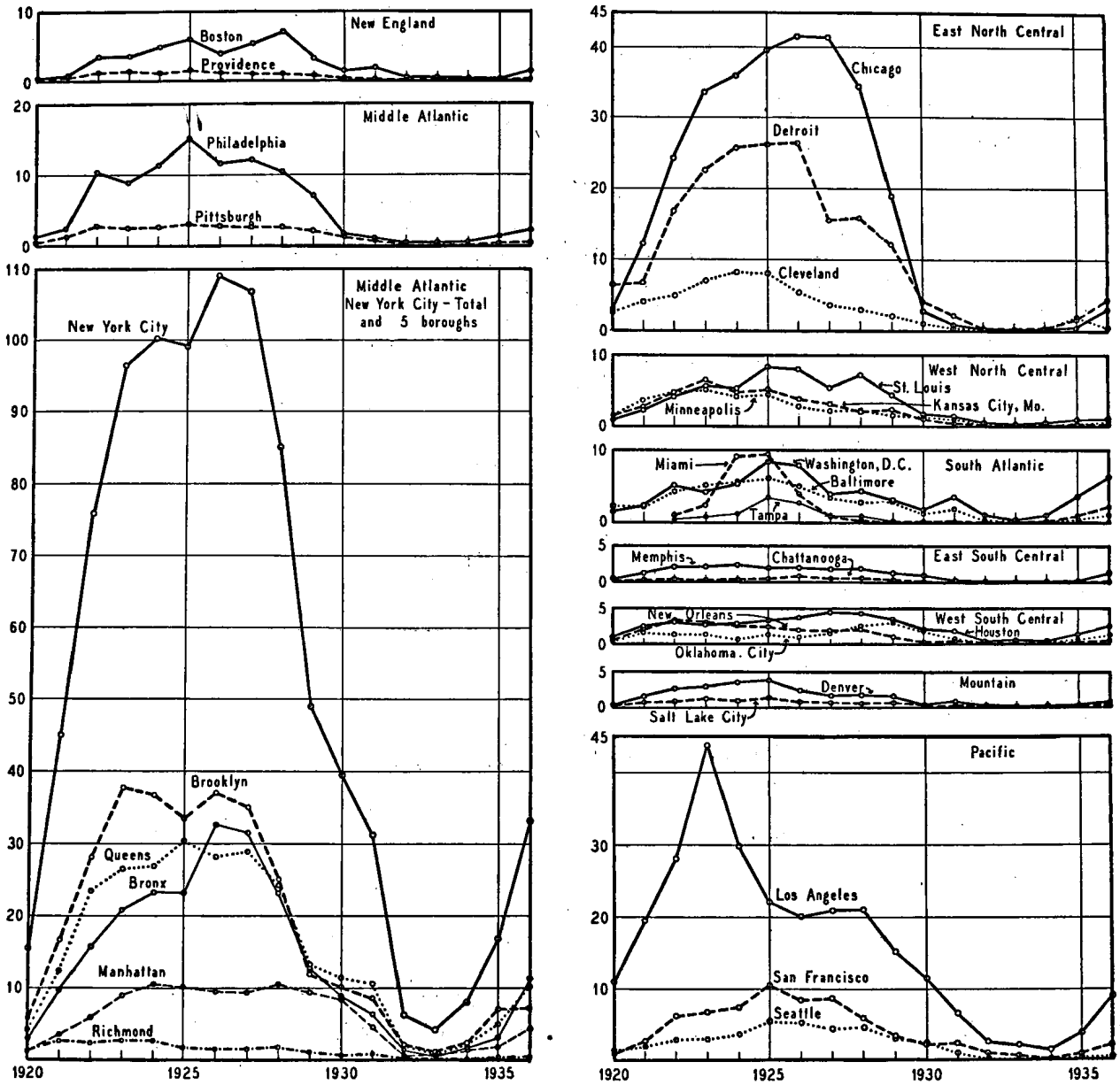
[10] A theoretical analysis of this tendency for certain factors influencing building to increase rather than diminish the amplitude of changes in the volume was made recently by A. F. Burns, 'Long Cycles in Residential Construction', *Economic Essays in Honor of Wesley Clair Mitchell* (Columbia University Press, 1935), pp. 63-104.

[11] 'Building Permits in the Principal Cities of the United States,' Bulletins 295, 318, 347, 368, 397, 424, 449, 469, 500, 524 and 545; *Monthly Labor Review*, March and April 1932, March and April 1933, and April 1934; 'Building Construction', Serial Nos. R-219, R-351 and R-538.

Chart 8

NUMBER OF FAMILIES PROVIDED WITH NEW DWELLING UNITS, 25 CITIES, 1920-1936

THOUSANDS OF DWELLING UNITS



lation of 25,000 or more. During 1933-35 reports were received from 811 to 819 cities above 10,000 in population, and each of the 1,689 cities reporting in 1936 had a population of 2,500 or more.

Principal reliance was placed on a consistent series for 257 identical cities having more than 25,000 population and reporting continuously since 1921; data for 1920 were estimated on the basis of the 189 cities reporting that year. For 1935 and 1936 the enlarged samples of 811 and 1,689 cities then available also were used in combination with the data for the 257 cities.

The 257 reporting cities accounted for about one-half of the total non-farm population, or approximately two-thirds of the population in centers with 2,500 or more, usually designated as urban. Thus, for estimating non-farm building, the problem was to determine the amount of building in areas having in the aggregate approximately half the total non-farm population.

In order to establish rates of change in population and building for different classes of cities, the 257 cities were classified into three groups, based on their location within, or outside, metropolitan districts as follows:

(1) 113 of the 120 central cities included in the 96 metropolitan districts as defined by the Bureau of the Census, the cities varying in size from 25,000 to more than 6,000,000 in population;

(2) 64 satellite cities of from 25,000 to 116,000 population in the environs of 14 of the 96 metropolitan districts, with 33 of the 64 cities in the environs of New York City and Boston, and none in the environs of central cities in the South, West Central or Mountain regions;

(3) 80 non-metropolitan cities with 25,000 to 100,000 population. The representation of these groups of cities in terms of population in 1920 and 1930 is shown in Table 8 and Charts 9 and 10. It is significant that the rates of growth of the unreported urban areas are considerably greater than those of the corresponding groups of reporting cities. Since residential building is correlated with the rate of growth of cities, it is important in making estimates that building rates reported in the sample of 257 cities be related to the varying rates of growth in the unreported areas.[13]

ESTIMATE OF THE NUMBER OF DWELLING UNITS BUILT, 1920-1929

The method adopted to estimate the aggregate volume of building during the decade 1920-29 was based directly on the Census data on families, utilizing ratios of the number of dwelling units built to the increase in number of families in cities reporting building permits, and applying these ratios or modifications of them to the increase in number of families in areas not covered by building permits.[14] The nature and application of these ratios may be illustrated as follows: it was estimated that 7,035,000 non-farm dwelling units were built in the decade 1920-29, which roughly matches the intercensal period January 1, 1920 to April 1, 1930, during which period Census data show a net increase of 5,541,000 in the number of non-farm families. The indicated ratio of number of units built to the increase in number of families is 1.27; in other words, for an increase of 100 families, approximately 127 units were built. The additional 27 units are accounted for as follows: By definition, the Census enumeration of families is also a count of the occupied dwelling units. The total number of all units standing, including those unoccupied, was not enumerated by the Census, and hence had to be estimated. When these vacant units in 1920 and in 1930 are added to the Census count of families (occupied dwellings) in 1920 and 1930 respectively, the net increase in the number of all units standing was over 6,580,000, of which 1,039,000 were vacant units. These 1,039,000 units may be apportioned roughly in three parts among: (a) building to make up the housing shortage that had accumulated at the beginning of the decade 1920-30; (b) building to provide a nominal vacancy accompanying the 5,541,000 increase in the number of occupied units; (c) excess building which resulted in greater than normal vacancy by 1930.

In addition to providing for the estimated increase of nearly 6,580,000 units in the total of all units standing, the building necessary to replace dwellings demolished to make way for other buildings, or by fire, flood and other causes was estimated to be 580,000 units, which, added to the 6,580,000 net increase in units standing would indicate a gross volume of building of 7,160,000 units. However, when allowance is made for the net increase in number of units from remodeling and conversion of many existing buildings, the net *new* construction for the decade is indicated to be only 7,035,000 dwelling units.

The ratio of the number of units built to the increase in the number of families, 1.27 for the entire non-farm area, is higher for large cities than for small towns for several reasons: (a) The additional building required to maintain a 'normal' vacancy tends to be relatively greater in the large cities, mainly because of the large number of apartments, in which vacancies usually average much higher than in one-family dwellings, which predominate in small communities. During 1920-30 the percentage increase in vacancy was greater in apartments than in other types.

[13]In the early stages of this study the method of computing per capita building rates in cities reporting building figures, and applying these rates to the population of unreported areas, was used to estimate the total number of dwelling units built in the decade 1920-29, distinguishing between metropolitan, non metropolitan and rural non-farm areas. The per capita building rate to be applied to an unreported area was selected from the regression line derived in a correlation for the corresponding group of reporting cities, determining the relation of (a) families provided for per 10,000 population during the decade 1920-29; (b) percentage increase in population between Census dates 1920 and 1930. (This is the general principle used recently by F. J. Hallauer to estimate the volume of building during 1920-29, Population and Building Construction, *Journal of Land and Public Utility Economics*, February 1934; and Population and Building Construction, a Revision, *Journal of Land and Public Utility Economics*, February 1936, and anticipated by W. I. King and Maurice Leven in 1924, Population Growth and Building, *Journal of American Statistical Association*, Vol. XIX, 1924 and the Federal Trade Commission in its report, 'The National Wealth and Income' (1926), p. 368.) A high degree of correlation was shown between building rates and population increase, almost entirely independent of size of city or geographic location. However, the method proved too unwieldy to apply on a regional basis, besides having other disadvantages, and its use was restricted to 1935 and 1936.

[14]This method rather than use of per capita building rates was the outgrowth of conversations with George Terborgh, to whom acknowledgement is due for many helpful suggestions made during the progress of this study.

(b) Building to replace dwellings demolished because of encroachment of business sections on residential areas, physical deterioration, or other causes is proportionately greater in large cities. In a new residential area outside city limits, building to replace demolitions would be virtually nil, and new construction generally would be in the proportion of one unit to each family moving into the area, since in most cases the moving of the family into the area would depend on the completion of a dwelling unit to accommodate it. (c) The majority of the largest cities, except Los Angeles, Detroit, and Queens and Bronx boroughs in New York City, have been growing more slowly

TABLE 8

POPULATION OF 257 CITIES REPORTING BUILDING PERMITS, AND CORRESPONDING UNREPORTED URBAN AND NON-FARM AREAS, BY CLASS OF CITY, 1920 AND 1930[1]

	POPULATION			
	1920[2] Jan. 1 *000's*	*1930 April 1* *000's*	INCREASE *1920-30* PER CENT	DISTRIBUTION *1930* PER CENT
METROPOLITAN DISTRICTS				
113 reporting central cities[3]	30,913	37,253	20.5	40.3
7 unreported central cities[4]	394	562	42.6	0.6
120 central cities	31,307	37,815	20.8	40.9
64 reporting satellite cities[5]	3,024	3,810	26.0	4.1
Unreported urban environs	4,667	7,517	61.1	8.1
Total urban environs (population 2,500 and over)[6]	7,691	11,327	47.3	12.2
Rural environs (population under 2,500)	3,682	5,612	52.4	6.1
Total environs	11,373[7]	16,939	48.9	18.3
177 reporting metropolitan district cities	33,937	41,063	21.0	44.5
Unreported metropolitan district areas	8,743	13,690	56.6	14.8
Total 96 metropolitan districts	42,680	54,753	28.3	59.3
NON-METROPOLITAN CITIES				
80 reporting non metropolitan cities	3,351	3,846	14.8	4.2
Unreported non-metropolitan cities	12,791	15,967	24.8	17.3
Total non-metropolitan cities	16,142	19,813	22.7	21.5
ALL URBAN AREAS				
257 reporting cities	37,288	44,909	20.6	48.6
Unreported urban areas	21,534	29,658	37.7	32.2
Total urban[8]	58,822	74,567	26.8	80.8
RURAL NON-FARM[9]	15,274	17,763	16.3	19.2
TOTAL NON-FARM	74,096	92,330	24.6	100.0

[1]'Reporting cities' are those in the Bureau of Labor Statistics series of 257 identical cities. 'Unreported areas' are cities or unincorporated areas not in the 257 cities.

[2]Population of reporting cities includes estimated 1920 population of areas annexed during 1920-30, to obtain comparable areas on 1930 basis.

[3]In 91 of 96 metropolitan districts.

[4]In 5 metropolitan districts: Evansville, Ind., Johnstown and Reading, Pa., Miami, Tampa, and St. Petersburg, Fla., and Ashland, Ky.

[5]In 14 of 96 metropolitan districts.

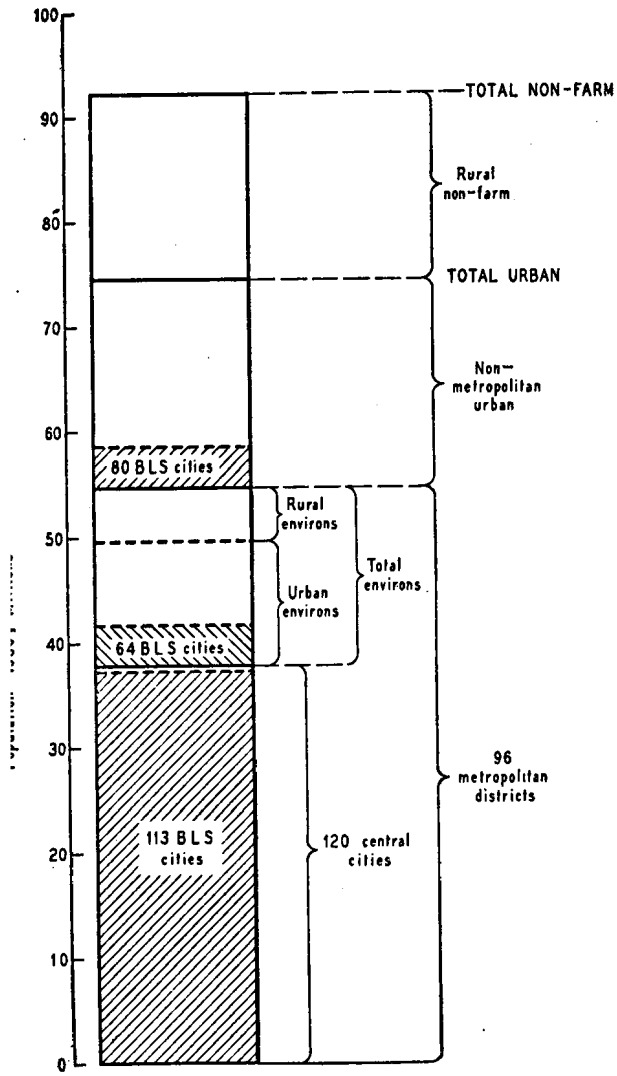
[6]Obtained by combination of special tabulations of population of satellite cities 2,500-25,000 (furnished by Division of Construction and Public Employment, U. S. Bureau of Labor Statistics) and satellite cities 25,000 and over (by National Bureau of Economic Research).

[7]Partly estimated. Census data available for environs of only 85 metropolitan districts in 1920.

[8]National Bureau of Economic Research classification: includes places under 2,500 in environs normally classified as 'rural' but considered as urban for estimating building. Census total 1930: 68,954,823; 1920 total for identical areas on 1930 classification: 55,140,358 (special tabulation of unpublished data, U. S. Bureau of the Census).

[9]National Bureau of Economic Research classification: excludes places under 2,500 in environs of metropolitan districts.

Chart 9
REPRESENTATION OF NON-FARM POPULATION, 1930, BY 257 CITIES REPORTING BUILDING PERMITS



than the smaller cities, consequently building on account of demolitions and vacancy change in the large cities would be larger relative to the absolute increase in number of families.[14]

These differences to be expected in the ratios of units built to increase in number of families are found in the 1920-29 data for the various classes of the 257 cities to be:

113 central cities	1.415
64 satellite cities	1.279
80 non-metropolitan cities	1.182

Estimates of the number of dwelling units built in each class of city were made separately for the nine geographic divisions, ratios for the unreported areas being assigned on the basis of the most nearly representative group of reporting cities. The major portion of the estimates were based on ratios under 1.200 and approaching 1.000, the equivalent of one new dwelling unit for each new family. The resulting aggregates for 1920-29 for the United States may be summarized thus:

	INCREASE IN NUMBER OF FAMILIES	RATIO OF UNITS BUILT TO INCREASE IN NUMBER OF FAMILIES	NUMBER OF UNITS BUILT
	000's		*000's*
120 central cities	2,192	1.415	3,102
Urban environs	1,016	1.227	1,247
Rural environs	537	1.148	616
Non-metropolitan urban	1,087	1.166	1,267
Rural non-farm	710	1.132	803
Total non-farm	5,541	1.270	7,035

The principal adjustments to the basic data, which were necessary prior to obtaining the above estimates, were:

(1) Estimate of the distribution of the number of urban families in 1920 and 1930 within and outside metropolitan districts by regions. (Census data for metropolitan districts are on a population basis only.)

(2) Estimate of the increase in number of families, 1920-30, on comparable areas involving:

(a) Inclusion of quasi-families (living in hotels, institutions, etc.) in 1930 to match population data and 1920 family data; later reduced to private family basis since estimates are for housekeeping units.

(b) Adjustment of 1920 population and family data, to include population of areas annexed between 1920 and 1930, affecting 121 of the 257 reporting cities.

(3) Correction of building data in reporting cities because of:

(a) Increased coverage due to annexations in 121 cities.

(b) Lapsed permits, principally for apartments in New York City.[15]

(4) Estimate of building volume in reporting cities for certain years:

(a) For 66 small cities in which family unit data were not available in 1920, and for 22 cities in which data were incomplete in 1920. Total volume thus estimated amounted to 12.8 per cent of the 1920 total, but only 0.4 per cent of the 1920-29 total for the 257 reporting cities.

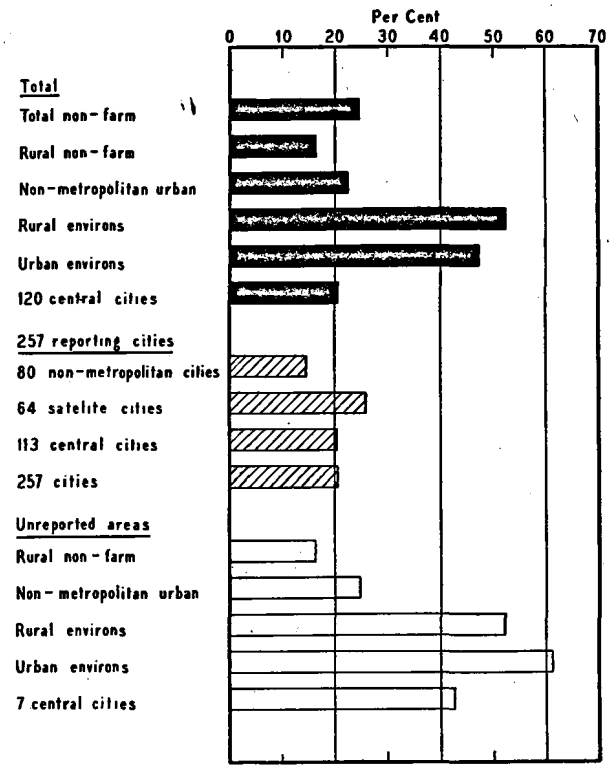
(b) For 7 central cities not included by the U. S. Bureau of Labor Statistics in the 257-city list because reports were lacking in one or more years. Estimates were made

[14]This would be true of any city having a low rate of growth regardless of size. If the number of families were to reach a maximum and the net increase in number of families become zero, the present method would not be applicable.

[15]Acknowledgment is due James Taylor of the Federal Housing Administration for suggestions as to this correction.

Chart 10

INCREASE IN POPULATION, 1920-1930, REPORTING CITIES AND UNREPORTED AREAS BY CLASS OF CITY



for missing years on the basis of the trend in adjacent cities. The number of units so estimated amounted to only 0.3 per cent of the volume for all 120 central cities. The chief advantage of including these data is that representation is given Miami, Tampa, and St. Petersburg, cities prominent in the Florida boom. Jacksonville, the only Florida city included in the 257 cities, was not representative.

ESTIMATED NUMBER OF DWELLING UNITS BUILT ANNUALLY, 1920-1936

The number of units built each year was obtained in two steps: first, preliminary totals of the number of units built in each class of city each year in the period 1920-36 were projected from the data for the 257 cities in the same proportions as indicated by the 1920-29 ten-year aggregates (see (a) below); second, these preliminary totals were corrected for the downward bias in the 257-city series (see (b) below).

(a) Preliminary totals

Data on the number of units built in the 120 central cities, comprising reported data for the 113 central cities in the 257-city list, and the data for the additional 7 central cities (partly estimated) required no further estimating.

Total building in the environs was derived by averaging two estimates made as follows: the first projected the trend of the 64 satellite cities by multiplying the reported number of dwelling units built in the 64 cities each year by 5.875.[16] The second estimate utilized the trend of building in all 184 of the reporting cities, both central and satellite cities in metropolitan districts, multiplying by 0.545.[17] Building in the urban and rural environs was estimated as 66.9 per cent and 33.1 per cent respectively of the total for all environs, based on the proportions shown in the 1920-29 aggregates. Building in non-metropolitan urban areas was estimated on the basis of the 80 reporting cities in this class. The trend of building in the rural non-farm areas was derived by averaging two estimates based on: (1) the 80 non-metropolitan cities; (2) total urban building.

The use of this method involves the assumption that for any homogeneous group of cities, the volume of building in the unreported areas outside the reporting cities follows the trend of building in the reporting cities year by year. This assumption appears to be valid when the cities are grouped as above, and when correction is made for the bias in the series of data for the respective groups of cities in the 257 reporting cities. This assumption would not be valid, if the combined trend for all the reporting cities were applied to the entire unreported non-farm area as a unit, as will be shown under (b). The year-to-year trend of building outside some individual cities likewise may differ considerably from that within the city. However, for groups of cities within reasonably large areas such as metropolitan districts, building in the environs generally follows that in the central city fairly closely. For example, the year-to-year building trends of the 14 reporting satellite cities in the Boston metropolitan district, taken individually, apparently had little relation to one another or to the trend in Boston, 1920-36, but the combined annual totals of the 14 cities, representing a sizeable sample of the environs, followed the trend in Boston. Similarly, in the environs of Providence, New York City and Philadelphia, the trend for each group of reporting satellite cities conformed to that of its central city. Similar relationships are found in data on new residential construction in 31 metropolitan districts as given in the 1934 Real Property Inventory of 64 cities; also, examination of building data for cities responding to much the same general economic conditions and rates of growth, even though in separate states, show close similarity in building trends. Thus the assumption that building in unreported

[16] Relation of number of units built in all environs to number of units built in 64 reporting satellite cities, 1920-29.

[17] Relation of number of units built in all environs to number of units built in 184 reporting central and satellite cities.

areas followed the trend of reporting cities appears to be applicable to areas that are homogeneous with respect to the factors influencing building. For these reasons estimates of year-to-year trends by metropolitan and non-metropolitan areas are probably more accurate than those made by regions.

(b) Correction for bias

The downward bias in the 257-cities series arose from the fact that building permits, restricted to areas within city limits, did not reflect the increasingly greater activity in the environs. Evidence of this bias is found in estimates of total non-farm building based on the augmented samples of cities in 1935 and 1936. The volume of all building outside the 257 cities increased during the depression to about two and one-half times that within the cities, in contrast to an average of about two times during 1920-29. This bias was continuous throughout the seventeen years, though to a much lower degree prior to 1928-29, as indicated by data for 31 metropolitan districts included in the Real Property Inventory of 64 cities, made in 1934. On the basis of these several sets of data, a number of factors were derived for correcting the preliminary annual totals described under (a) above. The percentage corrections are smallest in the years of greatest activity in the middle 1920's, and most pronounced during the depression when absolute volume was low.

The preliminary totals of non-farm units built were multiplied by the correction factors mentioned above to obtain the corrected non-farm totals, except in 1935 and 1936 when the estimates based on 811 and 1,689 cities were used. Since virtually all the central cities were covered by the permit reports, their estimated building would not be affected, but the estimates for building in the outside areas required adjustment so that the total would equal the corrected non-farm totals. In the absence of conclusive evidence to the contrary, it was assumed that the adjustment for each year applied equally to all the areas outside the central cities for 1920-30, but additional adjustments were made for 1931-36, on the basis of detailed estimates for 1936, made possible by the sample of 1,689 cities.

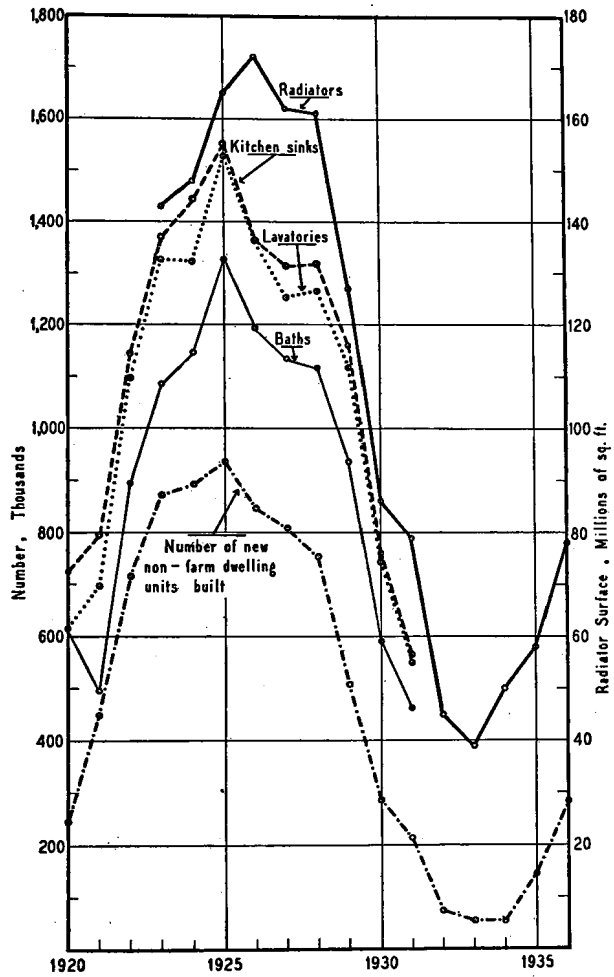
These estimates thus present the volume of building annually in five segments of the non-farm areas, reflecting the separate trends shown by sub-groups of the 257 cities, yet correcting for the tendency of building to shift outward from the large cities.

COMPARISON OF TREND WITH SHIPMENTS OF MATERIALS

As a check on the estimated trend of non-farm units built, comparison was made with other available measures of physical volume of residential building, including shipments of bathtubs, lavatories and kitchen sinks (Chart 11). The similarity of the trends is quite marked. Though a considerable volume of baths, sinks and lavatories went into replacements, non-residential buildings, modernization of old dwellings in cities, and in farm dwellings as well, the data on shipments appear to confirm the trend of the present estimates of the number of non-farm units built.

Chart 11

FACTORY SHIPMENTS OF RADIATORS, KITCHEN SINKS, LAVATORIES, AND BATHS COMPARED WITH NUMBER OF DWELLING UNITS BUILT



The trend of radiator shipments differs from that of all non-farm units built because relatively more are used in apartments, hotels, office buildings, schools and other non-residential structures, than in small dwellings. Radiator shipments reached a peak in 1926 and remained at high levels in 1927 and 1928. This movement resembled the trend of apartment building, which reached a maximum later than one- and two- family dwellings (see Chart 3).

ESTIMATED NUMBER OF DWELLING UNITS BUILT, BY GEOGRAPHIC DIVISIONS

Dwelling units built annually in each of the nine geographic divisions were estimated by much the same pro-

cedure as that described above: in the New England, North Central and South Central regions, preliminary totals of the number of non-farm units built each year were estimated in one process by raising the number of units built in the reporting cities of the 257-city series in each division in the proportions indicated for 1920-29. In the Middle Atlantic division separate estimates were made for environs, non-metropolitan cities and rural non-farm areas, based on the corresponding groups of reporting cities, but excluding New York City. In the South Atlantic and Mountain regions also separate estimates were made by class of city in order to give the sample of non-metropolitan cities proper weighting. In the Pacific division estimates for unreported areas were based on the 14 reporting cities, exclusive of Los Angeles which otherwise would have had a disproportionate weighting.

The entire series of estimates was then corrected for the downward bias of the 257 cities, so that the resulting United States totals matched those previously derived. This procedure assumes that the correction for bias is approximately the same for all regions since data are not now available on which to base different corrections for each region, with any degree of accuracy.

ESTIMATED NUMBER OF DWELLING UNITS BUILT, BY TYPE OF DWELLING

The number of units of each type of dwelling, i.e., apartments, one- and two-family dwellings, built each year was obtained in the same general manner as the total of all units, by class of city. First, the aggregate number of units of each type built during 1920-29 in each class of city was estimated on the basis of data in the 257 reporting cities, and Census data on dwellings. The two-family dwelling and apartment units built each year were then distributed according to their trends in the 257 reporting cities, since the latter accounted for a large portion of the total building of these types. One-family dwellings were estimated by subtracting the total of two-family and apartment units thus obtained, from the non-farm total of all units built each year as previously estimated.

ESTIMATED VALUE OF NEW DWELLING UNITS BUILT

The value of new non-farm dwelling units built was estimated by applying average cost per dwelling unit to the corresponding number of dwelling units built annually since 1920 in each class of city. Because of the limitations of the data, value estimates were not made by type of dwelling or by geographic division.

The average cost per dwelling unit in each class of city was based on the permit data for the corresponding group of reporting cities in the 257 cities, but corrected for undervaluation in building permits, and for non-representativeness of the sample. The derivation of the unit costs for the various classes of cities may be summarized thus:

(1) 120 central cities: the composite average cost per unit for all housekeeping units, including one-, two- and three-or-more family (apartment) dwellings in the 113 central cities, was obtained by subtracting the value of non-housekeeping dwellings from the value of all new residential building as published by the Bureau of Labor Statistics, and dividing by the "number of families provided for" each year. This average was increased 18 per cent as a tentative correction for undervaluation in building permits.

(2) Urban environs: the composite average cost per unit, similar to (1) above was derived for the 64 satellite cities, and increased 24 per cent, of which 18 per cent was correction for undervaluation. The additional correction was to allow for the higher average unit cost in satellite cities of 2,500-25,000 population than in the 64-city sample of cities over 25,000, as shown by 1936 data for 613 reporting satellite cities with a population of 2,500 or more.

(3) Rural environs (see (5) below)

(4) Non-metropolitan urban: since most of the non-metropolitan cities for which building must be estimated are cities of from 2,500 to 25,000 population in which one-family dwellings predominate, the one-family average unit cost is more representative than a composite average including apartments. Therefore, the average cost of one-family dwellings in the 80 reporting non-metropolitan cities was used each year, but reduced 3 per cent as the result of raising the average 18 per cent to correct for undervaluation, and then reducing it to represent all cities of this class properly. The latter correction was based on a comparison of the 1936 average values for the 80 non-metropolitan cities of 25,000 or more population in the 257-city list, and all 956 cities of this class having 2,500 or more population and reporting in 1936. The large volume of low-priced dwellings in the small non-metropolitan cities results in an average for this class only 0.82 of that for the 80-city sample, more than offsetting the correction for undervaluation.

(5) Rural areas: practically no information is available on the year-to-year cost of constructing dwellings either in the rural environs of metropolitan districts or in strictly rural areas. The cities reporting to the Bureau of Labor Statistics include none with a population less than 2,500 and therefore provide no representation in these rural areas and the F. W. Dodge data on contracts awarded do not lend themselves to a segregation between urban and rural construction. Consequently, the trend of average cost of dwelling units built in rural environs, predominantly one family, was estimated to follow the trend for one-family dwellings in the reporting satellite cities, but at a level 24 per cent lower. This relatively lower level was determined by a detailed study of estimated average value of all homes in places over 2,500 and places under 2,500 popu

lation, in environs of metropolitan districts, based on the 1930 Census data on values and rents.

Similarly, unit costs of new dwellings built in the rural non-farm areas were estimated as being 66 per cent of that derived for non-metropolitan urban centers from the relation of estimated values of structures in the rural non-farm areas and of values in the non-metropolitan urban cities based on the 1930 Census data.

The marked differences in the trends and relative levels of unit costs in the various classes of cities are shown in Chart 6. These unit costs multiplied by the number of units built each year (Table 3, B) give the estimated value of new housekeeping dwellings (Table 6, lines 1-9).

Tentative estimates of the value of all residential construction, including hotels, clubs and lodging houses, were made (Table 6) for the sake of comparison with other estimates previously available. No attempt was made to allocate the estimates for non-housekeeping units by geographic division or by class of city. These estimates for non-housekeeping dwellings are subject to correction on receipt of revisions of basic data for the 257 cities in earlier years, to be made by the Bureau of Labor Statistics.

Estimates of expenditures for repairs and alterations of residential buildings were not undertaken for this *Bulletin*.

Appendix

Unlike previous estimates of the total cost of new residential construction, the estimates in this study are based primarily on building permits in relation to change in number of families rather than on contracts awarded. This course was chosen only after detailed analysis of both series. Some of the limitations of the permit series were discussed in Section II. In attempting to make estimates from the F. W. Dodge Corporation data on residential contract awards three chief difficulties were encountered: (1) Total residential construction and one-family unit cost data were distorted by exclusion of contracts under $5,000 prior to 1930. This difficulty was made greater by the absence of any means of accurately measuring this omitted construction from the reported data themselves. (2) Data on number of family units constructed are incomplete. (3) Eleven western states are not represented.

The F. W. Dodge Corporation now[18] undertakes to provide virtually complete coverage of new non-farm residential building within the 37 eastern states, except for an undetermined volume of building covered by contracts under $2,000. The exclusion of contracts under $5,000[19] prior to 1930 caused a greater understatement of the actual volume of building than is generally recognized, and the resulting trend of the contracts reported is not representative for either the 37 states or the country as a whole, as may be demonstrated by the following rough tests: F. W. Dodge Corporation estimates of contracts awarded for residential structures in all 48 states, involving contracts over $5,000, were 22 billion dollars for 1920-29 (Table 9, col. 3). This total includes cost of hotels. Even if it were all in housekeeping dwellings and the average cost per family unit were $5,000, it would represent only 4,400,000 units for the decade, which falls considerably short of the ten-year increase of 5,500,000 in the number of occupied non-farm dwelling units reported by the Census of 1930. It is 2,600,000 units less than the probable total of about 7,000,000 units built during the decade, when allowance is made for the 1,500,000 additional units built to offset demolitions, fire and other losses, and for the increase in vacancy between 1920 and 1930. For the total of 22 billion dollars to have accounted for 7,000,000 dwelling units built, the average cost per unit would have had to be as low as $3,143, a figure much lower than any indicated by actual data on unit costs.

Contracts awarded, which include building in suburbs and rural areas, presumably had much greater coverage than building permits, which are confined to areas within city limits. However, it is significant that the value of residential building permits in 257 cities (Table 9, col. 5) in 1922 and 1923 actually exceeded contracts awarded in 37 states (col. 4) and averaged only slightly less than the estimated total of contracts in 48 states (col. 3).

The data on square feet of residential floor space in contracts also indicate the omission of a considerable volume of building: For 1920-29 the residential floor space in 37 eastern states amounted to 4,143,859,000 square feet.[20] Table 7 indicates that the number of dwelling units built in the 11 western states (Mountain and Pacific regions) is 19 per cent of the number for the 37 eastern states in that period. Thus, if the floor space for 37 states be raised 19 per cent to include the 11 western states a total of approximately 4,931,000,000 square feet is indicated for all 48 states. With an average as low as 1,000 square feet per dwelling unit this would represent only 4,931,000 units. However, it is unlikely that the floor space per unit for all types could have averaged as low as 1,000 square feet, since the bulk of one-family dwellings averaged 1,500 to 2,500 or more square feet, and this type predominates. Apartments might range from 700 to 1,000 square feet, but their volume would be insufficient to reduce the average

[18]Since 1935. The minimum was lowered to $2,000 in 1930, and again in 1932 was lowered to $1,000 for both new and alteration work. Beginning in 1935 the minimum for new work was restored to $2,000, the minimum for repairs remaining at $1,000.

[19]The $5,000 minimum was apparently not always strictly adhered to, as the average value of one-family dwellings reported in some southern and western states in earlier years was as low as $4,700-$4,800, or below the nominal minimum of $5,000.

[20]Reported in contracts, for 37 states, 1925-29, and estimated by F. W. Dodge Corporation for 1920-24 on the basis of contracts in 27-36 states.

TABLE 9

VALUE OF RESIDENTIAL BUILDING, COMPARISON OF ESTIMATES AND REPORTED DATA[1]

(millions of dollars)

YEAR	PRESENT ESTIMATE, 48 STATES[2]	CONTRACTS AWARDED 48 STATES FESB ESTIMATE[3]	CONTRACTS AWARDED 48 STATES F. W. DODGE ESTIMATE[4]	CONTRACTS AWARDED 37 STATES[5]	BUILDING PERMITS, 257 CITIES[6]
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
1920	1,122	.....	743	673	.....
1921	1,841	.....	1,146	1,027	937
1922	3,115	.....	1,735	1,555	1,612
1923	3,980	.....	2,073	1,807	2,001
1924	4,244	.....	2,399	2,112	2,070
1925	4,754	3,050	3,076	2,748	2,462
1926	4,314	2,965	2,958	2,671	2,256
1927	4,064	2,856	2,879	2,573	1,906
1928	3,813	3,095	3,069	2,788	1,859
1929	2,623	2,127	2,139	1,916	1,433
1930	1,456	1,222	1,240	1,101	601
1931	1,005	900	901	811	426
1932	282	311	.....	280	103
1933	204	.....	.....	249	91
1934	214	.....	.....	249	76
1935	585	.....	.....	479	212
1936	1,202	.....	.....	802	473

[1]Other than on farms. Includes non-housekeeping dwellings (hotels, clubs, etc.).

[2]New building only.

[3]Source: Federal Employment Stabilization Board, published in *Bulletin 52,* (National Bureau of Economic Research) November 15, 1934, p. 17.

[4]Source: F. W. Dodge Corporation. Excludes new construction and remodeling projects under $5,000.

[5]Source: F. W. Dodge Corporation. Totals for 1920-22 estimated by F. W. Dodge Corporation on basis of actual contract totals in 27 states; 1923 and 1924 on basis of 36 states. Includes repairs contracts over $5,000 prior to 1930, over $2,000 in 1930 and 1931, and over $1,000 since 1932.

[6]Source: U. S. Bureau of Labor Statistics, *Building Construction,* February 1937, p. 65.

to 1,000. Thus a composite average of 1,200 to 1,500 square feet per unit appears more likely, and if applied to the 4,931,000,000 square feet would represent between 4,100,000 and 3,287,000 units in contrast to the increase of 5,541,000 families, and the total of 7,035,000 units built.

Further evidence of the omission of a considerable volume of one-family and possibly two-family dwellings is disclosed in a comparison of the permit and contract data for these types. In 1925 aggregate value of one- and two-family dwellings for which permits were issued in 257 cities was approximately 1.42 billion dollars. Contracts awarded in 37 eastern states for one- and two-family dwellings in 1925 totaled 1.30 billion dollars,[21] an amount actually less than shown by building permits in the 257 cities. In 1928 contracts for one- and two-family dwellings in the 37 states totaled 1.41 billion dollars. If this high level had been maintained every year throughout 1920-29 it would have represented a total of 14.1 billion dollars; making a liberal allowance of 20 per cent for the 11 western states would raise this hypothetical total to 16.9 billion for all 48 states. At $5,000 per unit, the Dodge minimum for single contracts, this would have represented 3,390,000 units, or approximately 2 million units less than the 5,360,000 units that the estimates in this *Bulletin* indicate as the ten-year total of one- and two-family dwelling units (Table 2). Or, for the Dodge data to have accounted for the 5,360,000 units, with the aggregate value of 16.9 million, would imply an average cost per unit of only $3,150, an average clearly too low in view of the large volume of contracts actually reported, averaging $6,000-$9,000 and higher for one-family dwellings. The actual level of contracts awarded during the decade of course probably averaged from one-third to one-half less than the 1928 level of 1.4 billion dollars. Thus, it appears that contract data, if available for all 48 states throughout 1920-29, would probably have included considerably fewer than 3,000,000 one- and two-family dwelling units.

If as many one-family dwellings were excluded from the contract data because of the $5,000 minimum as are in-

[21]*Architectural Record,* July 1936, Vol. 80, No. 1, p. 24.

dicated above, it would go far towards explaining the difference in trend shown by the contract and permit series. For example, the estimates presented in this *Bulletin* indicate that in terms of family units, building of one-family dwellings reached a peak in 1925, while apartment building held at a high level through 1926, 1927 and 1928 (Chart 3). The exclusion of a large number of one-family dwellings from the contract data because of the $5,000 limit, and possible underreporting in small centers where the one-family type prevails, would tend to overweight the contract series with apartments, which reached highest levels during 1926-28. Inclusion of contracts for all one-family dwellings, with a peak in 1925 would probably have brought the combined total of contracts awarded to a maximum in 1925 instead of 1928, with volume in earlier years much higher than reported.

Acknowledgement is due the F. W. Dodge Corporation for making available to the National Bureau of Economic Research many detailed data on contracts awarded, ordinarily available only to subscribers to the Dodge Statistical Service. While these data were not used as the basis for the present estimates, they furnished valuable collateral material on building trends.

This BULLETIN *presents some of the first results of the major study, Real Estate Financing and Economic Stability, which was initiated at the request of the Social Science Research Council (Committee on Credit and Banking, Division of Industry and Trade) and has been carried on, with its support, by the National Bureau. A second publication, Urban Residential Real Estate, A Handbook of Basic Economic Data on Real Property in American Cities, will be released in the late autumn.*

Despite the great importance of urban real property in the national economy, no major studies have hitherto been undertaken. As a result, a large part of the three years spent on this project has been devoted to the collection of primary data on urban real property and the organization of scattered data into a form that would make them generally useful. David L. Wickens, under whose direction the study is being made in Washington, has compiled extensive data on values, rents, incomes and financing of real property—the largest volume and the widest range of information yet assembled.

By publishing this handbook the National Bureau is able not only to release the basic data earlier than would otherwise be possible but also obviate the necessity for a voluminous statistical appendix to the general discussion of the problems of real estate financing that will be published at a later stage in the inquiry. The volume will contain about 200 tables, a brief description of each principal table, and possibly some charts. It will provide individuals, Government agencies, banks and other institutions with useful material for studying numerous phases of the urban residential property situation.

Mr. Wickens is the expert on farm mortgages for the Department of Agriculture and the final report will cover farm as well as urban real estate. He participated in the inventory of real property and directed the financial survey of urban housing made by the United States Department of Commerce.

In view of the great expense of reproducing the basic tables, the National Bureau would like to have advance orders as a means of determining the size of the edition. The price of the book will depend somewhat upon the number printed but it will probably not exceed $5.00.

FROM REVIEWS OF RECENT NATIONAL BUREAU BOOKS

Ebb and Flow in Trade Unionism, by Leo Wolman (251 pp., $2.50)

"There are two ways of writing labor history. One may put oneself in the very position of the leaders of the movement performing the continuous experimenting with the general community and with labor itself, of which labor history is the written record. By this method of approach the reader is taken over a succession of concrete situations, resembling so many campaigns, and his attention is centered on the actual process of 'trial and error,' the decisions made, the obstacles encountered, the catastrophes and victories, and the institutions shaped. The generalizations which emerge deal with the characteristics of the American social habitat, the basic group psychologies on either side of the line, and the types of 'industrial government.' The second method of approach is that of a 'historical atlas of unionism.' Here the dominant interest is not the particular situation, the strategy employed, or the shape of the ultimate institutional structure, but all of these are reduced to a two-dimensional expression.

"The author's method is obviously the second one. Yet as an American labor student second to none in this generation for his intimate contact with industrial labor problems, both as an adviser of leaders and as an 'activist' on his own accord, Professor Wolman has made his 'quantitative' treatment simultaneously a most outstanding success as labor history writing of the first-mentioned variety. It is as if in watching the expansion and contraction of the red-tinted area on the geographical globe one could be made aware at the same time of the advances and retreats of the red-coated armies of Britain." Professor Selig Perlman, University of Wisconsin, in the *Journal of the American Statistical Association,* March 1937, Vol. 32, No. 197.

"This able and cautious book about trade unions in the United States appears at a suitable moment in the history

of the subject. The American labour movement is in the midst of an upheaval. The drive for industrial unionism on the lines now being laid by Mr. John L. Lewis, of the United Mineworkers of America, the most densely organised industrial union in the country, may well lead either to a fundamental change in American labour history, or it may pitchfork the United States into a spell of reaction. Mr. Wolman's careful study of the history of American trade unions from the end of the War down to the middle of last summer provides us with a stable background of facts and figures against which current speculations may be judged. Among the special characteristics of American trade unionism described by Mr. Wolman are the very small percentage of American workers who are in any way organised, the essentially 'craft' nature of most unions, the competitive factors of 'welfare capitalism' and undercutting in unorganised areas in so vast a country, the absence of a 'class psychology' basis for the labour movement as a whole, the strong anti-unionism of employers and the very important part played by political and governmental factors during the last three years. These matters are examined with the aid of a wealth of valuable statistics and an appendix containing information about the leading unions and about trade unions in other countries. We are left with a feeling that American trade unionism has an immense way to go, but that its very insignificance leaves room for great elasticity of movement in the future."
New Statesman and Nation, May 22, 1937

Prices in Recession and Recovery, by F. C. Mills
(561 pp., $4.00)

"Prices and price relationships almost completely dominate the economic life of the nation. Fundamental to human welfare as are the activities of production, distribution and consumption of goods, it is prices as a medium of control which, in their ceaseless changes and readjustment, stimulate or retard the processes by which our industrial and commercial life are carried on, and govern the direction of human effort.

In 1927 Dr. Mills made an important contribution toward an understanding of the nature and function of prices in *Behavior of Prices.* In 1932 he made a further contribution in *Recent Economic Tendencies.* In the present volume Dr. Mills has rounded out this study of prices by carrying it through the recent period of recession and revival.

These three works, covering the relationship and movement of prices since the beginning of the century, represent an objective exploration into the realm of prices and their nature and influence by an economist aloof from the pressure and the prejudices of business or politics. They comprise a record that doubtless will serve as source material for generations.

The present volume is of particular significance as an authentic record of price movements during a serious depression and the following revival. It is an excellent picture of the price mechanism as it has been affected by, and in turn has affected, the pattern of economic life during this period." *The Annalist,* December 25, 1936.

"Professor Mill's study of price-movements since 1929 must be one of the most minute ever made of any period, and is likely to prove a mine which will be gratefully worked by several generations of students to come. . . . He treats the question of decline and recovery comparatively for thirty-two countries. The inference is that the action taken, particularly in the monetary field, by their Governments accounts for the dissimilar course of events in these countries, since if that factor were not important one would expect to find countries of the same economic type experiencing the same price-movement (not necessarily simultaneously) in a given world situation. But, although Professor Mills observes that 'the international pattern is not a simple one,' he has little to say about purely monetary influences on the price structure. Rather he directs our attention to changes in the price-margins between different stages of production; to the changing position of primary producers; to the position of capital goods industries; and to changes in the prices of consumers' goods due, e.g., to the increased importance of salesmanship and advertising. British readers will perhaps be struck as much by his silence about the 'inflexibility' of wages as by his disregard of currency and credit policy. Indeed, part of the value of Professor Mills' study lies in its insistence on factors which have bulked large in the American situation, since it stimulates us to re-examine our ideas about the depression in this country. In particular, he brings out a point to which comparatively little attention has been paid by English economists—the fact that after the war the tendency was for the gap between the prices of finished products and those of raw materials of manufacture to widen, *reversing* the trend noticeable for a quarter of a century before. We are familiar with the compensatory cheapening of imports which helped us to last out the years of shrinking trade and growing unemployment with no great social distress; but we have not yet taken adequately into account the implications of the current trend. If it persists, the areas of primary production can no longer expect even to retain their former share of the world's real income; and the capital sunk in them when their prospects were better will have largely to be written off.

"To follow out such possibilities would, however, take us a long way beyond the scope of Professor Mill's book. He has confined himself to an elucidation of the facts of recent price-history. The result is a model of statistical research of which the publishing bodies may justly be proud." *Economist,* April 24, 1937.

National Bureau
of Economic Research

BULLETIN 66

SEPTEMBER 27, 1937

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

National Income, 1919-1935

Copyright 1937, National Bureau of Economic Research, Inc.

SIMON KUZNETS

This *Bulletin* presents comparable annual measures of the national income of the United States for the seventeen years from 1919 to 1935. They constitute a complete revision of the estimates for 1919-27 in W. I. King's *The National Income and Its Purchasing Power* (National Bureau of Economic Research, 1930) and a continuance of this series through 1929 and later years. For the period since 1929 these measures are based upon the estimates originally prepared by the Department of Commerce in cooperation with the National Bureau for 1929 through 1932 and subsequently revised and amplified by the Department; but they have again been revised and modified to assure comparability with earlier years and to take advantage of more recent data.

The measures released in this *Bulletin* for circulation among the subscribers embody Dr. Kuznets' broad findings. Somewhat more detailed figures and supporting data, together with materials on the flow of commodities and the formation of capital, will be published in a monograph by Dr. Kuznets, *National Income and Capital Formation, 1919-1935*, now in press. The complete record of the national income study will appear in a later volume.

Throughout this study, Dr. Kuznets was assisted by Lillian Epstein and Elizabeth Jenks; and during recent months also by Edna Ehrenberg. We are indebted to the Department of Commerce for permission to consult the details of its estimates of national income for recent years.

1. DEFINITIONS AND SCOPE

National income may be defined as the net value of commodities and services produced by the nation's economic system. It is 'net' in that the value of output of all commodities and services is reduced by the value of commodities (fuel, raw materials and fixed equipment) consumed in the process of production. And it refers, by design, to the net product of the economic system, which, for the advanced nations during recent decades, may be identified with the market economy; provided 'market' is understood broadly as the meeting-place of all buyers and sellers, no matter how much the freedom of transactions may be curbed by custom or regulation.

National income is thus that part of the national product which is largely imputable to individuals who contribute to production either their labor or the services of their property. In return for this participation these individuals receive compensation, which accounts for the preponderant share of national income produced in any given year. But there may be two other elements in national income. First, the producing enterprises may make payments not only to individuals who, in a given year, participate in the productive process, but also to individuals who participated in it in the past or have not participated at all. Pensions, compensation for injuries, relief payments, and charity contributions by business enterprises are channels through which income produced in a given year may be paid to individuals other than those sharing in the process of producing it. Second, enterprises may distribute to individuals amounts not necessarily equal to the part of national income that these enterprises produce. In some years a business firm or other producing enterprise may pay out to individuals an amount smaller than its share in national income, thus retaining what we designate as positive savings of enterprises. In other years an enterprise may distribute to individuals an amount larger than its own share in the national total, thus giving rise to negative savings of enterprises. If we designate all receipts by individuals from the producing enterprises as income payments to individuals, national income is equal to the algebraic sum of incomes paid to individuals and of savings of all enterprises.[1]

[1]National income as thus defined is identical with what in earlier publications we designated as 'national income produced' (see *National Income, 1929-1932*, Senate Doc. No. 124, 73rd Cong., 2d Sess., and *Bulletins 49* and *59* of the National Bureau of Economic Research). The magnitude designated in these publications as 'national income paid out' is here identified as 'aggregate income payments to individuals'. This change in terminology resulted from the discussions prior to and at the meeting of the Conference on Research in National Income and Wealth held in January 1937.

The available data render it necessary to estimate national income by a procedure corresponding to the second definition, i.e., the aggregate of all incomes paid to individuals plus the estimated positive or negative savings of enterprises. For each industrial branch, whose distinction is both possible and significant, we estimate, so far as data permit, the various payments to individuals: wages, salaries, withdrawals by individual entrepreneurs, interest, dividends, pensions, compensation for injury. Net rents can be estimated only for the country as a whole, not by industrial branches. We include not only monetary payments but also some payments that appear in the form of commodities or services: (1) farm produce retained by farm families for their own consumption; (2) payments in kind to employees; (3) services of houses inhabited by their owners. On the other hand, we exclude some incomes that appear in the form of money but that represent payment for activities that are unproductive when judged by the most lenient standard of productivity: (1) illegal activities (theft, robbery, prostitution, murder, etc.); (2) such activities as, while legal, represent largely shifts of income among individuals rather than additions to the command over goods (gambling, speculative gains from sale of assets by non-professional groups); (3) speculative gains of any type resulting from a general change in the price level. Finally, we add to these incomes disbursed to individuals the net savings of enterprises.

This description of the scope of national income measures is admittedly all too brief. It is also impossible to indicate within the scope of this *Bulletin* the limitations to which these measures are subject owing to the weakness of supporting data for some of the component elements. In general, the estimates are most reliable for those industrial branches for which basic data have been available for some time (public utilities reporting to the Interstate Commerce Commission, manufacturing, mining), and least reliable for those industrial branches for which basic Census data are still lacking or are of only recent origin (service industries, real estate, and, of course, the miscellaneous group). Of the various types of income the estimates are most reliable for those whose flow is recorded directly in the data (wages, salaries, dividends and interest) and least reliable for entrepreneurial withdrawals, rents and savings of enterprises.

2. TOTAL NATIONAL INCOME AND ITS CHANGES

As defined above and measured in current prices, the national income of this country since 1919 is given in the first column of Table 1 (see also Chart 1). The marked changes since the War are obvious. After a trough in 1921 of 58.5 billion dollars, which followed immediately the peak in 1920 of 72.7 billion, there was a fairly steady rise to the next peak in 1929 of 83.6 billion. The severe character of the contraction that followed is manifest in the decline to a trough of 39.2 billion dollars in 1933, a drop of 53 per cent from the peak of 1929. Since 1933 national income has risen materially, but in 1935 it was still 36.5 per cent below the 1929 level.

These marked fluctuations in total national income do not reflect only changes in the net volume of commodities and services produced. A substantial part is accounted for

TABLE 1

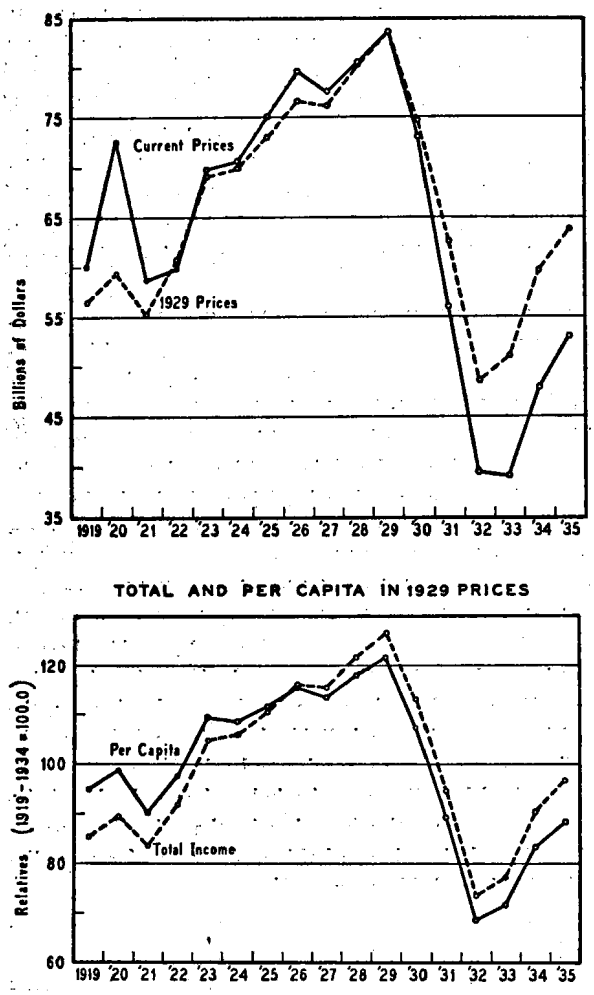
NATIONAL INCOME, TOTAL AND PER CAPITA, 1919-1935

	TOTAL NATIONAL INCOME		PER CAPITA
	Current prices	1929 prices	IN 1929 PRICES
	(*millions of dollars*)		
1919	60,161	56,424	538
1920	72,689	59,368	559
1921	58,521	55,192	511
1922	59,857	60,615	552
1923	69,895	69,214	620
1924	70,557	69,978	616
1925	75,026	73,034	633
1926	79,658	76,639	655
1927	77,608	76,273	643
1928	80,559	80,392	669
1929	83,631	83,614	689
1930	73,111	74,740	609
1931	56,089	62,618	506
1932	39,555	48,554	389
1933	39,247	51,121	407
1934	47,960	59,684	472
1935[1]	53,118	63,832	501
Average I 1919-1934	65,258	66,091	567
Average II 1919-1926	68,296	65,058	586
Average III 1927-1934	62,220	67,124	548
Percentage change from average II to average III	—8.9	+3.2	—6.5

[1]The estimates of national income for 1935 in this and subsequent tables rest upon a much more slender foundation than those for the earlier years. For this reason the averages for the period or parts of the period usually exclude the figure for 1935.

It was concluded that the use of the two terms 'national income produced' and 'national income paid out' as equally important concepts created confusion and led to misinterpretations; that the term 'national income' should be reserved for the magnitude formerly called 'national income produced,' as being the most inclusive category and most consonant with the national income concept current in economic writings; and that the magnitude formerly called 'national income paid out,' being a subdivision of national income, would be best described by a specific term. For a more extended discussion see Section I of the forthcoming Volume I of *Studies in Income and Wealth* by the Conference on Research in National Income and Wealth.

Chart 1
NATIONAL INCOME, TOTAL AND PER CAPITA
1919 - 1935



by changes in market values from year to year, and some attempt to eliminate these was made in order to interpret national income in terms of the flow of commodities and services (see the second column of Table 1, national income measured in constant market values of 1929). This adjustment was made as follows. In the study of capital formation in the United States we obtained a measure of net capital formation, comprising the net volume destined for use by business and government agencies, the net accretion to the volume of residential construction, and the net change in claims against foreign countries. This measure of net capital formation was available in terms of both current market values for each year and constant 1929 prices. We then subtracted net capital formation in current market values from national income in current prices, obtaining the part of national income that may be designated as consumers' outlay; adjusted this part for changes in prices of consumable goods, on the assumption that these changes were reflected in the index of wage earners' cost of living compiled by the United States Bureau of Labor Statistics; and then recombined this consumers' outlay part of national income in 1929 prices with the volume of net capital formation in 1929 prices.[2]

This adjustment for changes in price level is admittedly approximate, partly because the index of wage earners' cost of living reflects only crudely changes in prices of all consumable goods and services represented in national income; and partly because the measurement of net capital formation in constant prices is necessarily approximate, owing to the relative scarcity of reliable indexes of prices of capital goods. Nevertheless, the estimate of national income in 1929 prices is a much better measure of changes in the volume of commodities and services produced than is national income in current market values. In comparing the two estimates, we observe that the volume in 1929 prices rose much more during the period, i.e., grew more appreciably from the early years to 1929 and declined much less appreciably during the contraction that followed. Thus, the rise to 1929 from the average during 1919-21 was, in terms of current prices, 31 per cent; in constant prices, 47 per cent. The declines from 1929 to 1933 were 53 and 39 per cent, respectively. And when the arithmetic means of the two halves of the period from 1919 through 1934 are compared, national income measured in current prices shows a decline from 68.3 to 62.2 billion dollars; in constant prices it shows a rise from 65.1 to 67.1 billion.

It is of interest to compare changes in national income in constant prices, which describe roughly the movements in the country's current net supply of commodities and services, with the changes in the country's population, i.e., the people who have produced this supply and to whom most of it became available as a fund for consumption and savings. This comparison shows that the rise in the net national product and its decline after 1929 were accompanied by an increase in the population;[3] consequently per

[2] For the estimates of net capital formation see *National Income and Capital Formation*, a Preliminary Report, Section VIII. The choice of 1929 prices as the constant price level in which to express national income was dictated by its corresponding use in the capital formation study. However, since the level of prices in 1929 was only slightly below that of 1926 and only slightly above the average price level for the entire period, 1919-35, it may be taken to represent, with respect to the level of market values, an average rather than an exceptional year.

[3] For annual estimates of population we are indebted to Professors W. S. Thompson and P. K. Whelpton of the Scripps Foundation, Miami, Ohio.

capita income rose appreciably less and declined more than did total income. Thus, while the latter rose from 59.4 billion dollars in 1920 to 83.6 in 1929, 41 per cent, per capita income rose from $559 to $689, only 23 per cent. The declines from 1929 to 1932 were 42 and 43.5 per cent respectively. The averages for the two halves of the post-War period show that when reduced to a per capita basis, the rise observed in total income is replaced by a decline.

3. DISTRIBUTION ACCORDING TO INDUSTRIAL ORIGIN

A few comments may help the reader to understand the evidence of Tables 2 and 3, which show, in current prices, the distribution of national income and of aggregate income payments to individuals among the industrial branches in which they originated.[4] First, not all types of income can be traced back to their industrial sources. Thus rent payments, actual and imputed, cannot be apportioned among the various industries in which they originated, and have been treated by us as entrepreneurial income in the real estate industry. Second, in measuring business savings, the available data from accounting records on business profit and loss after payment of dividends must be adjusted in several ways in order to yield an adequate measure of business savings; and some of these adjustments can be made only for the national income total as a whole or only for the major industrial divisions.[5] Thus the correction for the difference between depreciation charges in cost and reproduction prices can be made only for national income as a whole, not for the various industrial subdivisions; and the apportionment among industrial branches in Table 2 is of national income, unadjusted by this particular correction. Similarly, the adjustment for gains and losses from inventory holding can be made for the transportation and public utilities, and finance groups, but not separately for their subdivisions. For this reason Table 2 provides both adjusted and unadjusted totals for these two industrial divisions. But the two adjustments are relatively minor, and the effect of their total or partial omission on the distribution by industrial sources is relatively insignificant.

The industrial divisions distinguished in Tables 2 and 3 call for little explanation. Construction refers to contract construction only, and does not include income originating in construction activities undertaken by business enterprises and by public agencies on their own account. The composition of the large groups of transportation and public utilities and of finance is shown in the tables. Real estate includes, in addition to income arising from dealing in, managing or servicing real estate property, all rents, paid and imputed. Government covers not only the Federal government but also all other governmental units in the United States, including income originating in public education and the Post Office. Service covers the numerous branches of service activities: religious, professional, domestic, personal, recreation and amusement, and business. The miscellaneous group is a catch-all for the various activities that cannot be measured separately and properly under the relevant division. It includes such highly dissimilar enterprises as truck and bus transportation, taxicabs, brokerage houses.

The industrial divisions in Tables 2 and 3 may be assembled in three major groups. Group I, comprising agriculture, mining, manufacturing and construction, may be characterized as the industries dealing primarily and largely with the production of commodities. Group II, comprising transportation and public utilities and trade, may be characterized as commodity handling. This characterization, while true of trade, is only roughly true of transportation and public utilities because even steam railroads carry passengers and the activities of such divisions as communication can hardly be classified as handling commodities. Still, the preponderant part of even the combined transportation and public utilities group is devoted to handling commodities, rather than commodity production or the provision of services to individuals. Group III, comprising finance, government, service and miscellaneous, may be characterized broadly as service industries; and while it includes some commodity handling in the miscellaneous division, the relative share of this activity or of commodity production is probably very small.

Table 2, Part B reveals that a large share of total national income arises from activities that do not constitute either production or handling of new commodities; the latter together account, on the average, for slightly over 61 per cent of national income, and the payments to which they give rise account for about the same percentage of aggregate income payments. The remainder is accounted for largely by activities that are either services by individuals to other individuals or to society as a whole, services rendered by highly durable commodities to individuals, or services rendered in connection with the production and handling of commodities but so distinct from the latter activities as to constitute a separate industry.

As among the three groups there were clear-cut differences in the movement over the period as a whole (see Chart 2). Whether expressed in percentages of national income or of aggregate income payments, the relative share of the commodity producing branches declined. Most of

[4] The grand totals in Tables 2, 3, 4 and 5 are obtained by an addition of the totals for each industrial branch. The income subtotals by industrial branches are primarily in thousands of dollars. Hence the rounded figures given here for the individual industries do not always add up exactly to the totals shown.

[5] For a more detailed discussion of these adjustments see Section 4.

TABLE 2

DISTRIBUTION OF NATIONAL INCOME ACCORDING TO INDUSTRIAL ORIGIN, 1919-1935

A. ABSOLUTE FIGURES

(millions of dollars)

	1919	*1920*	*1921*	*1922*	*1923*	*1924*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*
1 Agriculture	11,236	8,986	6,226	5,828	6,690	7,325	7,769	7,294	7,199	7,282	7,231	5,510	3,488	2,182	3,080	4,276	4,696
2 Mining	1,832	2,508	1,709	1,430	2,183	1,810	1,954	2,288	1,945	1,719	1,893	1,471	872	503	503	1,007	1,116
3 Manufacturing	16,171	19,907	12,627	13,079	16,784	15,598	16,833	18,151	17,186	17,927	19,828	16,179	10,997	6,248	6,644	9,814	11,546
4 Construction	1,501	2,258	1,895	1,910	2,617	2,892	2,955	3,128	3,129	3,100	3,091	2,646	1,688	708	506	795	878
5 Transportation and other public utilities																	
a Electric light and power and manufactured gas[1]	425	496	524	620	778	880	1,070	1,154	1,248	1,407	1,564	1,614	1,503	1,262	1,146	1,091	1,106
b Steam railroads, Pullman and express[1]	3,937	4,844	3,814	3,822	4,437	4,265	4,486	4,667	4,465	4,482	4,653	3,870	2,974	2,090	2,122	2,222	2,378
c Pipe lines, street railways and water transportation[1]	1,215	1,538	1,250	1,213	1,274	1,291	1,285	1,293	1,245	1,266	1,299	1,143	961	745	707	740	801
d Communication[1]	417	514	532	578	636	677	746	804	841	902	1,001	970	883	724	636	667	701
e Total of above[1]	5,994	7,391	6,121	6,234	7,126	7,113	7,588	7,917	7,799	8,058	8,517	7,597	6,321	4,820	4,610	4,721	4,986
f Adjusted total	5,989	7,461	6,371	6,228	7,089	7,127	7,624	7,934	7,838	8,043	8,513	7,715	6,395	4,860	4,583	4,654	4,991
6 Trade	10,115	11,587	9,692	8,562	10,091	9,742	10,082	11,486	10,465	10,895	11,177	10,901	8,789	6,006	4,846	5,819	6,863
7 Finance																	
a Banking[1]	852	938	902	893	938	1,002	1,100	1,145	1,192	1,290	1,316	1,126	786	516	407	472	613
b Insurance[1]	556	553	550	581	668	748	906	1,000	1,150	1,283	1,293	1,178	1,066	888	830	881	945
c Real estate[1]	4,069	4,480	4,759	5,339	5,742	6,240	6,276	6,322	6,443	6,974	6,932	6,037	4,746	3,484	2,947	2,845	3,086
d Total of above[1]	5,477	5,971	6,211	6,813	7,347	7,989	8,282	8,467	8,785	9,547	9,541	8,341	6,598	4,888	4,185	4,198	4,644
e Adjusted total	5,397	5,918	6,299	6,810	7,363	7,997	8,304	8,489	8,786	9,551	9,541	8,344	6,644	4,906	4,171	4,193	4,643
8 Government	1,158	7,209	6,329	6,706	7,342	7,549	7,808	8,326	8,709	8,666	8,742	8,356	6,721	5,786	6,984	7,903	7,802
9 Service	6,413	7,022	6,408	7,691	8,290	8,798	9,611	10,195	10,015	10,693	11,224	10,136	8,602	6,375	6,111	7,236	8,261
10 Miscellaneous	2,264	2,416	2,014	2,159	2,538	2,607	2,861	3,083	3,034	3,257	3,077	2,211	1,883	1,537	1,361	2,248	2,397
Total A (of groups and subgroups)	62,162	75,255	59,233	60,414	71,009	71,423	75,743	80,334	78,267	81,143	84,322	73,347	55,959	39,053	38,829	48,017	53,189
Total B (of groups)	62,077	75,272	59,571	60,405	70,988	71,445	75,801	80,373	78,307	81,132	84,318	73,468	56,079	39,111	38,788	47,945	53,193
Group I (1-4)	30,740	33,659	22,457	22,248	28,274	27,624	29,510	30,861	29,459	30,027	32,044	25,805	17,045	9,641	10,733	15,891	18,236
" II (5f and 6)	16,104	19,048	16,063	14,791	17,181	16,869	17,706	19,420	18,303	18,938	19,690	18,616	15,184	10,866	9,430	10,473	11,854
" III (7e-10)	15,232	22,565	21,051	23,367	25,533	26,952	28,585	30,092	30,545	32,167	32,584	29,047	23,850	18,604	18,626	21,580	23,103

B. PERCENTAGE DISTRIBUTION

1 Agriculture	18.1	11.9	10.5	9.6	9.4	10.3	10.3	9.1	9.2	9.0	8.6	7.5	6.2	5.6	7.9	8.9	8.8
2 Mining	2.9	3.3	2.9	2.4	3.1	2.5	2.6	2.8	2.5	2.1	2.2	2.0	1.6	1.3	1.3	2.1	2.1
3 Manufacturing	26.0	26.5	21.3	21.6	23.6	21.8	22.2	22.6	22.0	22.1	23.5	22.1	19.7	16.0	17.1	20.4	21.7
4 Construction	2.4	3.0	3.2	3.2	3.7	4.0	3.9	3.9	4.0	3.8	3.7	3.6	3.0	1.8	1.3	1.7	1.7
5 Transportation and other public utilities																	
a Electric light and power and manufactured gas	0.7	0.7	0.9	1.0	1.1	1.2	1.4	1.4	1.6	1.7	1.9	2.2	2.7	3.2	3.0	2.3	2.1
b Steam railroads, Pullman and express	6.3	6.4	6.4	6.3	6.2	6.0	5.9	5.8	5.7	5.5	5.5	5.3	5.3	5.4	5.5	4.6	4.5
c Pipe lines, street railways and water transportation	2.0	2.0	2.1	2.0	1.8	1.8	1.7	1.6	1.6	1.6	1.5	1.6	1.7	1.9	1.8	1.5	1.5
d Communication	0.7	0.7	0.9	1.0	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.3	1.6	1.9	1.6	1.4	1.3
e Total of above	9.6	9.8	10.3	10.3	10.0	10.0	10.0	9.9	10.0	9.9	10.1	10.4	11.3	12.3	11.9	9.8	9.4
6 Trade	16.3	15.4	16.4	14.2	14.2	13.6	13.3	14.3	13.4	13.4	13.3	14.9	15.7	15.4	12.5	12.1	12.9
7 Finance																	
a Banking	1.4	1.2	1.5	1.5	1.3	1.4	1.5	1.4	1.5	1.6	1.6	1.5	1.4	1.3	1.0	1.0	1.2
b Insurance	0.9	0.7	0.9	1.0	0.9	1.0	1.2	1.2	1.5	1.6	1.5	1.6	1.9	2.3	2.1	1.8	1.8
c Real estate	6.5	6.0	8.0	8.8	8.1	8.7	8.3	7.9	8.2	8.6	8.2	8.2	8.5	8.9	7.6	5.9	5.8
d Total of above	8.8	7.9	10.5	11.3	10.3	11.2	10.9	10.5	11.2	11.8	11.3	11.4	11.8	12.5	10.8	8.7	8.7
8 Government	1.9	9.6	10.7	11.1	10.3	10.6	10.3	10.4	11.1	10.7	10.4	11.4	12.0	14.8	18.0	16.5	14.7
9 Service	10.3	9.3	10.8	12.7	11.7	12.3	12.7	12.7	12.8	13.2	13.3	13.8	15.4	16.3	15.7	15.1	15.5
10 Miscellaneous	3.6	3.2	3.4	3.6	3.6	3.7	3.8	3.8	3.9	4.0	3.6	3.0	3.4	3.9	3.5	4.7	4.5
Total A	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Group I (1-4)	49.5	44.7	37.7	36.8	39.8	38.7	38.9	38.4	37.6	37.0	38.0	35.1	30.4	24.6	27.7	33.1	34.3
" II (5f and 6)	25.9	25.3	27.0	24.5	24.2	23.6	23.4	24.2	23.4	23.3	23.4	25.3	27.1	27.8	24.3	21.8	22.3
" III (7e-10)	24.5	30.0	35.3	38.7	36.0	37.7	37.7	37.4	39.0	39.6	38.6	39.5	42.5	47.6	48.0	45.0	43.4
Total B	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Not adjusted for gains and losses on holding of inventories.

TABLE 3

DISTRIBUTION OF AGGREGATE INCOME PAYMENTS TO INDIVIDUALS ACCORDING TO INDUSTRIAL ORIGIN, 1919-1935

A. ABSOLUTE FIGURES

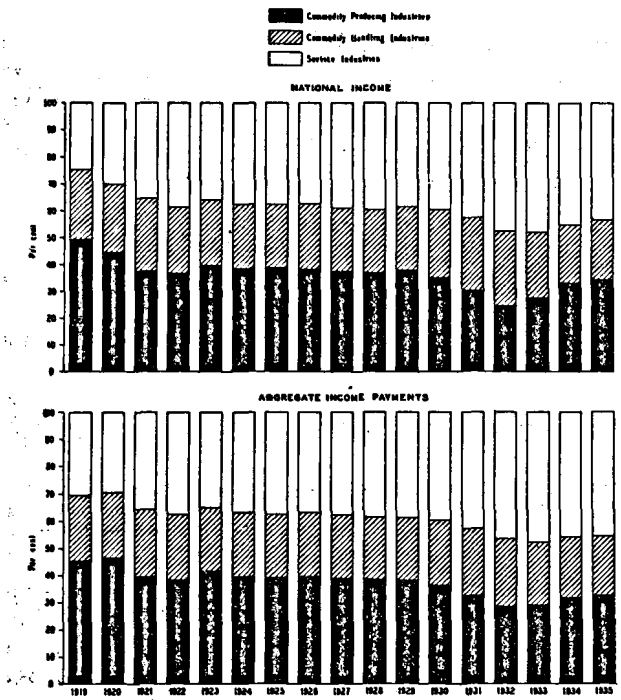
(*millions of dollars*)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
1 Agriculture	8,480	9,757	6,592	6,350	7,022	7,094	7,197	7,351	7,333	7,328	7,354	6,617	5,258	4,041	3,813	4,152	4,545
2 Mining	2,796	2,494	1,861	1,703	2,428	2,099	2,054	2,382	2,111	1,886	2,059	1,712	1,186	799	790	1,111	1,167
3 Manufacturing	14,292	16,780	11,732	12,255	15,262	14,553	15,383	16,168	16,260	16,893	18,035	15,864	12,288	8,567	8,516	10,509	11,710
4 Construction	1,541	2,093	1,623	1,975	2,657	2,702	2,852	2,951	2,909	3,063	3,031	2,518	1,644	833	794	938	908
5 Transportation and other public utilities																	
a Electric light and power and manufactured gas	426	477	491	556	707	837	922	1,022	1,098	1,247	1,367	1,474	1,453	1,304	1,189	1,126	1,132
b Steam railroads, Pullman and express	3,879	4,830	3,820	3,716	4,155	4,023	4,104	4,238	4,289	4,122	4,260	3,892	3,193	2,351	2,175	2,333	2,484
c Pipe lines, street railways and water transportation	1,171	1,467	1,247	1,210	1,239	1,257	1,252	1,256	1,231	1,235	1,258	1,209	1,036	872	738	778	836
d Communication	391	493	502	532	590	634	677	728	760	801	892	924	871	779	703	727	753
e Total	5,867	7,287	6,059	6,014	6,690	6,751	6,956	7,243	7,378	7,405	7,777	7,498	6,554	5,306	4,803	4,964	5,205
6 Trade	8,034	9,039	7,676	8,032	8,802	9,029	9,478	9,970	9,807	10,030	10,650	10,178	8,926	7,016	6,239	6,749	7,117
7 Finance																	
a Banking	627	738	795	808	832	863	903	948	1,012	1,054	1,165	1,128	1,016	796	611	632	679
b Insurance	510	615	635	674	771	854	955	1,045	1,114	1,182	1,273	1,263	1,167	963	859	911	957
c Real estate	4,055	4,522	4,794	5,324	5,786	6,223	6,374	6,382	6,500	6,973	7,260	6,323	5,097	3,894	3,301	2,985	3,144
d Total	5,193	5,874	6,223	6,806	7,390	7,939	8,232	8,375	8,626	9,208	9,698	8,714	7,280	5,653	4,771	4,528	4,780
8 Government	5,202	5,299	5,492	5,553	5,728	5,896	6,058	6,267	6,514	6,741	7,028	7,209	7,341	7,265	7,838	8,974	9,364
9 Service	5,202	6,302	6,050	7,250	7,502	8,191	8,953	9,241	9,495	10,097	10,751	9,975	9,092	7,806	8,115	8,130	9,023
10 Miscellaneous	1,893	2,130	1,868	2,103	2,375	2,508	2,759	2,874	2,948	3,173	3,425	3,334	2,996	2,499	2,200	2,330	2,468
Total	57,499	67,056	55,177	58,041	65,854	66,763	69,921	72,823	73,381	75,823	79,808	73,620	62,565	49,785	47,880	52,385	56,287
Group I (1-4)	26,108	31,124	21,809	22,283	27,368	26,448	27,486	28,853	28,613	29,170	30,479	26,711	20,376	14,240	13,913	16,710	18,330
" II (5e and 6)	13,901	16,326	13,735	14,046	15,492	15,780	16,433	17,213	17,185	17,434	18,427	17,676	15,480	12,322	11,042	11,713	12,322
" III (7d-10)	17,489	19,605	19,633	21,712	22,994	24,534	26,002	26,757	27,583	29,218	30,902	29,233	26,710	23,223	22,924	23,962	25,635

B. PERCENTAGE DISTRIBUTION

1 Agriculture	14.7	14.6	11.9	10.9	10.7	10.6	10.3	10.1	10.0	9.7	9.2	9.0	8.4	8.1	8.0	7.9	8.1
2 Mining	3.1	3.7	3.4	2.9	3.7	3.1	2.9	3.3	2.9	2.5	2.6	2.3	1.9	1.6	1.6	2.1	2.1
3 Manufacturing	24.9	25.0	21.3	21.1	23.2	21.8	22.0	22.2	22.2	22.3	22.6	21.5	19.6	17.2	17.8	20.1	20.8
4 Construction	2.7	3.1	2.9	3.4	4.0	4.0	4.1	4.1	4.0	4.0	3.8	3.4	2.6	1.7	1.7	1.8	1.6
5 Transportation and other public utilities																	
a Electric light and power and manufactured gas	0.7	0.7	0.9	1.0	1.1	1.3	1.3	1.4	1.5	1.6	1.7	2.0	2.3	2.6	2.5	2.1	2.0
b Steam railroads, Pullman and express	6.7	7.2	6.9	6.4	6.3	6.0	5.9	5.8	5.8	5.4	5.3	5.3	5.1	4.7	4.5	4.5	4.4
c Pipe lines, street railways and water transportation	2.0	2.2	2.3	2.1	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.8	1.5	1.5	1.5
d Communication	0.7	0.7	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.3	1.4	1.6	1.5	1.4	1.3
e Total	10.2	10.9	11.0	10.4	10.2	10.1	9.9	9.9	10.1	9.8	9.7	10.2	10.5	10.7	10.0	9.5	9.2
6 Trade	14.0	13.5	13.9	13.8	13.4	13.5	13.6	13.7	13.4	13.2	13.3	13.8	14.3	14.1	13.0	12.9	12.6
7 Finance																	
a Banking	1.1	1.1	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.3	1.2	1.2
b Insurance	0.9	0.9	1.2	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.9	1.9	1.8	1.7	1.7
c Real estate	7.1	6.7	8.7	9.2	8.8	9.3	9.1	8.8	8.9	9.2	9.1	8.6	8.1	7.8	6.9	5.7	5.6
d Total	9.0	8.8	11.3	11.7	11.2	11.9	11.8	11.5	11.8	12.1	12.2	11.8	11.6	11.4	10.0	8.6	8.5
8 Government	9.0	7.9	10.0	9.6	8.7	8.8	8.7	8.6	8.9	8.9	8.8	9.8	11.7	14.6	16.4	17.1	16.6
9 Service	9.0	9.4	11.0	12.5	11.4	12.3	12.8	12.7	12.9	13.3	13.5	13.5	14.5	15.7	16.9	15.5	16.0
10 Miscellaneous	3.3	3.2	3.4	3.6	3.6	3.8	3.9	3.9	4.0	4.2	4.3	4.5	4.8	5.0	4.6	4.4	4.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Group I (1-4)	45.4	46.4	39.5	38.4	41.6	39.6	39.3	39.6	39.0	38.5	38.2	36.3	32.6	28.6	29.1	31.9	32.6
" II (5e and 6)	24.2	24.3	24.9	24.2	23.5	23.6	23.5	23.6	23.4	23.0	23.1	24.0	24.7	24.8	23.1	22.4	21.9
" III (7d-10)	30.4	29.2	35.6	37.4	34.9	36.7	37.2	36.7	37.6	38.5	38.7	39.7	42.7	46.6	47.9	45.7	45.6

Chart 2
PERCENTAGE DISTRIBUTION OF NATIONAL INCOME AND OF AGGREGATE INCOME PAYMENTS BY MAJOR INDUSTRIAL DIVISIONS
1919 - 1935



the decline occurred from 1919 to 1921 and from 1929 to 1932, but there was a downward drift even from 1923 to 1929; and inspection of the percentages for each industrial division in this group shows that in three—agriculture, mining and manufacturing—this downward movement in the percentage share of national income or of aggregate income payments is clearly and consistently present. Only in construction, owing to the long swing characteristic of the industry, is this declining trend in relative importance not obvious.

The group called 'commodity handling' shows no such decline in its relative share of national income or of aggregate income payments. This percentage share varies somewhat from year to year, both for the group as a whole and for its two divisions, but reveals no definite trend over the period for its components or the total. While the various industrial branches subsumed under transportation and public utilities show distinct and different trends in their relative shares over the period (e.g., the growth in the importance of electric light and power and gas, and of communications, and the decline in that of steam railroads and other transportation) their combination cancels these conflicting movements.

In contrast to the share of commodity producing industries, the relative weight of the service industries rose distinctly over the period. This rise was apparent in each of the important subdivisions of this group, finance, government and service. The conclusion is thus unavoidable that the development of the economic system since the War has meant, as far as the composition of the national net product is concerned, a shift away from production of new commodities to service activities significantly different in character and industrial organization from the production and handling of commodities.

It should be emphasized that these conclusions refer to the industrial distribution of national income in current prices. When adjustment for price changes is made for the specific industrial branches, the changes in industrial distribution might quite possibly be substantially different. A preliminary analysis of such a distribution of national income in constant prices suggests that the decline in the relative share of commodity producing industries and the rise in the relative share of service industries has been mainly due to the greater decline in the prices of commodities than in the prices of services.[6] But in view of the slender basis upon which the difficult adjustment for price changes rests, this conclusion can be treated as a tentative suggestion deserving further exploration.

4. DISTRIBUTION ACCORDING TO TYPE OF INCOME

a. *Meaning of Classification.* The allocation of national income discussed in this section has already been suggested in the definition in Section 1 above. Business and other enterprises engaged in the production of income distribute most of their share in it as payments to individuals in return for their services or the services of their property; or in the form of payments to individuals only remotely connected with the productive process (pensions, compensation for injuries, relief payments, etc.). The residue, which may be either positive or negative, represents the net savings of these enterprises. It is of obvious importance to study how total national income is apportioned between such savings and aggregate income payments to individuals; and how the latter are apportioned among various types of payment. Such allocations can be made for total national income only as measured in current market values; they are presented in Table 4 for 1919 through 1935.

The various types of payment distinguished call for little comment. Wages, salaries, pensions, dividend and interest payments are familiar. It need be noted only that dividend payments measured here cover disbursements to individuals, and thus exclude the intercorporate dividend flow; that interest payments cover only interest on long term debt, upon the assumption that all short term interest is paid to other business enterprises and that short term

[6] See the forthcoming volume, *National Income and Capital Formation*, A Preliminary Report, Section III.

TABLE 4

DISTRIBUTION OF NATIONAL INCOME ACCORDING TO TYPE OF INCOME, 1919-1935

A. ABSOLUTE TOTALS

(millions of dollars)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
1 Wages and salaries[1]	38,821	45,750	36,705	39,124	45,183	45,420	47,651	50,362	50,570	52,196	55,191	50,332	42,943	33,894	32,432	35,785	38,755
2 Compensation for injuries,[2] pensions and relief[3]	476	636	720	730	755	779	723	718	749	768	809	851	953	976	1,920	2,764	2,876
3 Employees' compensation[1,2,3]	39,297	46,387	37,424	39,854	45,938	46,199	48,373	51,080	51,319	52,964	56,000	51,182	43,896	34,870	34,353	38,549	41,631
4 Withdrawals by entrepreneurs[4]	9,651	11,095	7,993	7,751	8,271	8,455	8,593	8,544	8,499	8,538	8,677	7,910	6,554	5,303	5,062	5,515	5,994
5 Rents	2,670	2,999	3,296	3,754	3,915	4,169	4,146	3,902	3,675	3,788	3,763	3,111	2,088	1,319	1,311	1,165	1,323
6 Entrepreneurial income payments	12,321	14,094	11,289	11,505	12,186	12,624	12,739	12,446	12,174	12,327	12,440	11,021	8,642	6,622	6,373	6,680	7,317
7 Dividends[5]	2,812	3,123	2,848	2,920	3,714	3,655	4,237	4,601	4,892	5,209	5,807	5,708	4,270	2,679	2,147	2,497	2,845
8 Interest[6]	3,041	3,410	3,546	3,676	3,922	4,156	4,418	4,586	4,864	5,174	5,409	5,507	5,474	5,362	4,837	4,566	4,445
9 Property income payments[6]	5,882	6,575	6,463	6,682	7,730	7,940	8,808	9,297	9,888	10,532	11,367	11,417	10,028	8,293	7,154	7,156	7,339
10 Aggregate income payments to individuals	57,499	67,056	55,177	58,041	65,854	66,763	69,921	72,823	73,381	75,823	79,808	73,620	62,565	49,785	47,880	52,385	56,287
11 Net savings of business enterprises[7]	6,706	3,722	2,506	663	2,427	2,141	3,355	4,777	2,031	2,810	2,109	—1,656	—5,856	—8,751	—7,779	—3,354	—1,607
12 Net savings of government	—4,044	1,910	838	1,153	1,614	1,653	1,751	2,059	2,195	1,926	1,714	1,147	—620	—1,479	—854	—1,070	—1,562
13 Total net savings of enterprises	2,661	5,633	3,344	1,816	4,042	3,794	5,106	6,836	4,227	4,736	3,823	—509	—6,476	—10,230	—8,633	—4,425	—3,169
14 National income	60,161	72,689	58,521	59,857	69,895	70,557	75,026	79,658	77,608	80,559	83,631	73,111	56,089	39,555	39,247	47,960	53,118

B. PERCENTAGE DISTRIBUTION

1 Wages and salaries	67.5	68.2	66.5	67.4	68.6	68.0	68.1	69.2	68.9	68.8	69.2	68.4	68.6	68.1	67.7	68.3	68.5
2 Compensation for injuries, pensions and relief	0.8	0.9	1.3	1.3	1.1	1.2	1.0	1.0	1.0	1.0	1.0	1.2	1.5	2.0	4.0	5.3	5.1
3 Employees' compensation	68.3	69.2	67.8	68.7	69.8	69.2	69.2	70.1	69.9	69.9	70.2	69.5	70.2	70.0	71.7	73.6	74.(
4 Withdrawals by entrepreneurs	16.8	16.5	14.5	13.4	12.6	12.7	12.3	11.7	11.6	11.3	10.9	10.7	10.5	10.7	10.6	10.5	10.(
5 Rents	4.6	4.5	6.0	6.5	5.9	6.2	5.9	5.4	5.0	5.0	4.7	4.2	3.3	2.6	2.7	2.2	2.(
6 Entrepreneurial income payments	21.4	21.0	20.5	19.8	18.5	18.9	18.2	17.1	16.6	16.3	15.6	15.0	13.8	13.3	13.3	12.8	13.(
7 Dividends	4.9	4.7	5.2	5.0	5.6	5.5	6.1	6.3	6.7	6.9	7.3	7.8	6.8	5.4	4.5	4.8	5.1
8 Interest	5.3	5.1	6.4	6.3	6.0	6.2	6.3	6.3	6.6	6.8	6.8	7.5	8.7	10.8	10.1	8.7	7.5
9 Property income payments	10.2	9.8	11.7	11.5	11.7	11.9	12.6	12.8	13.5	13.9	14.2	15.5	16.0	16.7	14.9	13.7	13.(
10 Aggregate income payments to individuals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.(
11 Total net savings of enterprises as percentage of aggregate income payments to individuals	4.6	8.4	6.1	3.1	6.1	5.7	7.3	9.4	5.8	6.2	4.8	—0.7	—10.4	—20.5	—18.0	—8.4	—5.(

[1]Including withdrawals by entrepreneurs in service and miscellaneous.

[2]Including payments by steam railroads, Pullman and express for compensation for injuries to persons other than employees.

[3]Including payment by the government for direct relief and work relief in 1933, 1934 and 1935.

[4]Excluding withdrawals by entrepreneurs in service and miscellaneous which are included with wages and salaries.

[5]A small amount of dividends from corporations engaged in agriculture is included with interest payments.

[6]Including net balance of international payments.

[7]These net savings are adjusted throughout for the effects of changing inventory valuations and for the differences between depreciation at cost prices and at curren prices. But the adjustment for gains and losses on sale of capital assets was possible only since 1929. The items for these years, the adjustment for which is already mad in the table, are as follows (in millions of dollars):

1929	1930	1931	1932	1933	1934	1935
+816	—337	—1,509	—1,621	—1,500	—376	—157

interest paid to individuals by banks represents an indirect flow of long term interest; and that the only allowance possible for intercorporate long term interest payments is that on government securities.[7] Entrepreneurial withdrawals are the amounts that individual entrepreneurs withdraw from their business for consumption and investment elsewhere—an estimate necessarily highly tentative. Rents received by individuals comprise both actual monetary rental received, minus the expenses incurred, and imputed net rental to the individuals who own the houses in which they reside. While compensation for injuries covers small amounts paid to individuals other than employees, it may be grouped with pensions, relief, wages and salaries as employees' compensation. Withdrawals by entrepreneurs and rents may be classified as entrepreneurial income, although there is some ground for classifying rent with property income. Dividends and interest receipts are individuals' property income.

Savings of enterprises is a residual item of controlling importance, and should, in accordance with our definition of national income, equal the difference between the current value of all commodities and services produced, less the current market value of commodities consumed in production, and total income payments to individuals. The entry on the income account of business enterprises that most closely corresponds to net savings as thus defined is net profit or loss, after deduction of dividends and income taxes. But this item still differs from the desired measure of net savings in the following respects: (a) it includes gains and losses on sale of capital assets; (b) it estimates the consumption of durable commodities, subject to depreciation and depletion, at their original cost, not at current reproduction cost; (c) it measures the consumption of current materials at original cost, when prices are rising, or at cost or market, whichever lower, when prices are declining, instead of evaluating them at market price at the time of consumption. Thus, in order to arrive at a correct figure for net savings of enterprises, the item available from business accounting records must be adjusted for all these possible departures, an adjustment that can be made in varying degree for the various distortions noted.

Gains and losses on sale of capital assets can be excluded only since 1929; and savings, and hence national income are uncorrected in this respect for all years before 1929. The magnitude of this item can be judged by its amount (1.6 billion dollars) for 1932, the year covered by data in which it was largest (see note 7 to Table 4).

The correction for the difference between the depreciation and depletion deductions in reproduction and original cost prices could be made for all the years in the period by utilizing the estimates prepared by Solomon Fabricant.[8] It was possible to do so, however, only for national income as a whole, not for its various industrial categories.

The disparity between the value of non-durable commodities consumed at cost and at market price can be estimated approximately by reducing the year-end inventories for each year to a common price level, obtaining the change in inventories, expressing this change in prices for the current year, and then comparing it with the difference in the year-end inventories in their changing current valuations. This disparity, which measures the reported net profit or loss due to revaluation of inventories, can be computed not only for national income as a whole but also for most of the industrial branches distinguished.

Finally, for government, savings were computed directly, by comparing the net change in the basic fixed assets of government, i.e., buildings, roads, etc., with the net change in total government debt. The former item was obtained from estimates of total public construction, available in the capital formation study, reduced for each year by the depreciation on government fixed assets as estimated by Solomon Fabricant. The second item is easily derived from the data on total outstanding government debt. The resulting difference represents a crude estimate of net savings by all government agencies, i.e., the amount by which the net addition to fixed assets exceeded or fell short of the total change in debt outstanding.

Having commented upon the meaning of the various categories in Table 4, we may now note how gaps in the available data affected the allocations. First, absence of relevant data made it impossible to segregate wages and salaries from entrepreneurial withdrawals in service and miscellaneous industries before 1929. In 1929 total entrepreneurial withdrawals in these two industrial divisions amounted to about 5.1 billion dollars while salaries and wages were estimated at 8.5 billion; we decided, therefore, to include the combined item with wages and salaries rather than with entrepreneurial withdrawals. Since total salaries and wages of all industries in 1929 were over 50 billion dollars, the addition to this total of entrepreneurial withdrawals in service and miscellaneous industries could not greatly affect the relative weight or changes in relative importance of employees' compensation. But the exclusion of this item from total entrepreneurial withdrawals may have affected significantly the latter total. Second, as already indicated, net savings of business enterprises prior to 1929 could not be adjusted for gains and losses on sale

[7] These various assumptions are made largely because we lack data upon which to base a more accurate measure of interest payments to individuals.

[8] His preliminary estimates were published in Measures of Capital Consumption, 1919-1933, *Bulletin 60*. In this *Bulletin* we have utilized his revised estimates which will appear in detail in a final report, *Capital Consumption*.

of capital assets, an omission that in view of the material price changes, especially in the early years of the period, may well have affected this item considerably.

b. *Importance of Net Savings of Enterprises.* When we view now the apportionment of national income between payments to individuals and net savings of enterprises, two conclusions stand out clearly. When considered over a fairly long period the share retained by enterprises appears to be relatively small, thus indicating that the overwhelming bulk of national income produced is distributed as payments to individuals. The cumulative total of net savings of business enterprises over the period as a whole, including 1935, amounts to only about 4.2 billion dollars; the inclusion of net savings of government raises it to 12.6 billion dollars. These totals average per year only 0.25 and 0.74 billion dollars respectively, and constitute only 0.4 and 1.1 per cent of the average national income.

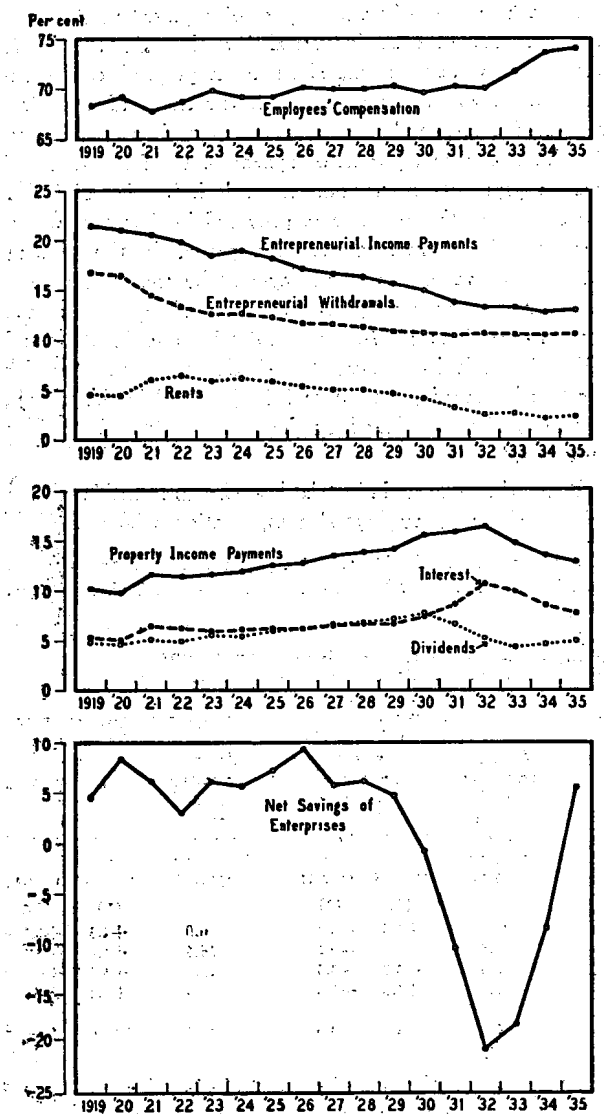
However, these averages conceal the extreme variations in the savings of enterprises, and the close conformity of these variations to fluctuations in the country's general business conditions—two characteristics that make this item exceedingly important in determining changes in total national income and render its measure useful in arriving at an understanding of economic fluctuations. The great variability of savings of enterprises is shown by the fact that whereas the algebraic average of the item amounts to only 0.74 billion dollars per year (including savings of government), and to 0.25 billion dollars when confined to savings of business enterprises alone, the averages of this item with signs disregarded are 4.7 and 3.7 billion dollars per year respectively. The range in the variation is quite striking. Total net savings of enterprises ranged from a peak of plus 6.8 billion dollars in 1926 to a trough of minus 10.2 billion dollars in 1932. When we compare total national income for these two years it is seen that, of its decline of 40 billion dollars, over 40 per cent is accounted for by the decline in net savings alone. Similarly, net savings of business enterprises (exclusive of savings by government) range from a peak of plus 6.7 billion dollars in 1919 to a trough of minus 8.8 billion dollars in 1932; and of the decline in national income of some 20 billion dollars between these two years, the drop in net savings of business enterprises alone accounts for over 15 billion dollars or for about 75 per cent. Also, the fluctuations in net savings, particularly in savings of business enterprises, follow closely the changes in general business conditions, showing very conspicuously the contractions of 1920-21, 1924, 1927 and 1930-32. It is surprising that both total savings of enterprises and savings of business enterprises declined from 1928 to 1929, but this may be due largely to the adjustment for gains on sale of capital assets in the latter year but not in the former.

c. *Changes in Distribution by Type of Payment.* In considering the various types of payment and grouping them in the broad categories of employees' compensation, entrepreneurial income and property income, we are concerned not only with the absolute quantities but also with the relative proportions accounted for by each, especially with any changes in the proportions. This concern arises from the fact that these types of income represent largely the compensation of various groups in the economic system. Wages and the bulk of salaries constitute the main income of a large group in the population whose per capita income is relatively low; and changes in the relative share of wages and salaries indicate, though only approximately, changes in the relative share of the low income groups. Dividends and interest disbursements are received largely by those whose average income is relatively high; and a change in the proportion of income going out as dividends and interest is, with certain qualifying conditions, an index of the change of the share of income received by the high income groups in the income-receiving population. Entrepreneurial incomes occupy an intermediate position, and tend to vary greatly in average magnitude from one industrial branch to the next. The group is dominated by agriculture and retail trade, and thus represents the main income of that large class of small entrepreneurs whose average income is fairly low and subject to the vicissitudes of the competitive struggle under changing business conditions.

The share of various types of payment is measured in percentages of aggregate income payments, not in percentages of total national income for the reason that net savings of enterprises cannot be assigned as an income share to any specific group of income recipients. There is often an inclination to treat these savings as part of property income, on the ground that such savings or losses affect most conspicuously the value of securities held by the recipients of interest and dividend payments. But if incurring a business loss or retaining business savings by an enterprise does affect the fortunes of its security holders, the net savings as measured by us are hardly a measure of the effect. And it may reasonably be argued that savings of enterprises in an industry are as important to the employees as to the owners, and have as much effect on their economic welfare. Upon this assumption, percentage allocation among the types of payment of national income would be identical with that of aggregate income payments to individuals.

Table 4, Part B and Chart 3 show that employees' compensation, including wages and salaries, pensions, relief and entrepreneurial withdrawals in service and miscellaneous industries, accounted on the average for about 70 per cent of the total flow of income payments to individuals; and that this relative share remained fairly constant over the period. If the percentages are averaged for the two halves

Chart 3
VARIOUS TYPES OF PAYMENT AND NET SAVINGS OF ENTERPRISES IN PERCENTAGES OF AGGREGATE INCOME PAYMENTS 1919–1935



of the post-War period, the resulting means suggest a slight upward trend; this impression is confirmed when it is seen that before 1926 the percentage in the third line never went above 69.8, while beginning with 1926 it was at the level of 69.9 or higher in all years except one. But the differences are too small to indicate any definite rise in the share of employees' compensation; and the averages are considerably affected by the increased importance of relief in 1933, 1934 and 1935.

The other two major groups of payment both show distinctive and significant trends. The share of entrepreneurial incomes declined continuously, owing largely to the decline in the relative share of entrepreneurial withdrawals. Indeed, prior to 1932 the percentage share of the latter declined each year except in 1924, and from a level of about one-sixth of total income payments in 1919 and 1920 it dropped to about one-tenth in 1933 and 1934.* The relative share of the rent item showed at first a rise, associated with the decline in expenses and the high rent levels prevailing in the years before the expansion of the volume of construction exercised a moderating effect on rents; then a decline, which became especially precipitous after 1929. In contrast to entrepreneurial income, the relative share of property income rose distinctly over the period as a whole, accounting for one-tenth of total income payments in the early years of the period and about one-sixth in the later years. This upward tendency was manifest in both dividend and interest payments before 1929, but since then primarily in the latter. If rents were added to dividends and interest payments in a new total of property income, the share of the latter would still show a marked rise over the period.

The changes in the relative shares of various types of payment indicated in Table 4 are of considerable significance, and deserve further exploration. It would be of especial interest to ascertain whether both the changes over the period and the fluctuations that appear to be associated with business cycles persist when the dollar volumes are corrected for changes in the price level. But since the specific price data needed for such an inquiry are not available, it cannot be pursued. However, some further test of the conclusions just drawn from Table 4 can be made by a study of the cross-classification of aggregate income payments by type of payment and industrial source.

5. CROSS-CLASSIFICATION BY TYPE OF PAYMENT AND INDUSTRIAL SOURCE.

In considering the combined classification by type of payment and industrial source, various lines of inquiry may

*This downward tendency would undoubtedly persist even were entrepreneurial withdrawals in service and miscellaneous industries included with all other entrepreneurial withdrawals. If we assume that this item, now included with employees' compensation, doubled between 1919-20 and 1929, an assumption that tends to exaggerate any upward movement that may have existed in it, the inclusion would add slightly over 4 per cent in 1919-20 and slightly over 6 per cent in 1929 to the share of entrepreneurial incomes. This would still leave a decline in entrepreneurial withdrawals from about 20.8 per cent in 1919-20 to 17.3 in 1929.

On the other hand, the exclusion of this item from employees' compensation would remove completely any slight rise that appeared in its relative share; this, of course, on the improbable assumption that the increase in entrepreneurial withdrawals in service and miscellaneous industries has attained the striking magnitude suggested above.

be pursued. It is possible to determine whether the changes observed in the relative shares of various types of payment in the country's total are also present within each industrial branch distinguished; and to ascertain how the shift in the relative importance of various industrial branches contributed to the changes in the relative proportions of the various types of payment. It is also possible to study the changes observable in the relative share of various industrial branches within each type of payment; and to see how the shift in the relative importance of various types of payment contributed to the changes in the relative share of the various industrial branches.

It would not be possible here, or generally profitable, to pursue all these lines of inquiry. We confine the analysis to the question how the change in the distribution by type of payment within each industrial branch, and the shift in the relative weight of the various industrial branches, have contributed to the changes in the percentage share of the various types of payment in the nation's aggregate of income payments. We thus make the changes in the distribution by type of payment the dependent variable, rather than the shifts in the relative weight of various industrial divisions in the nation's economic system: the growth and change of the various industries appears to us to be the independent factor that provides the framework within which changes in the percentage distribution by type of payment are to be understood.

The first question to be answered is whether shifts in the relative shares of various types of payment in the total also occurred in each industrial branch. Do the slight upward movement in the share of employees' compensation, the downward movement in the share of entrepreneurial income, and the marked upward movement in the share of property income, appear in the distribution of income payments originating in each industrial division? An answer to this question is provided in Table 5, which measures the movement over the period in the relative share of the various types of payment by the total change in the average percentage for two pairs of segments of the post-War period: 1919-26 and 1927-34, and 1922-26 and 1927-31. We have computed similar measures also for the two intervening sets of periods (omitted in the table); our conclusions are based on the consideration of all these measures.[10]

When the separate industrial branches are considered, the relative share of employees' compensation which, for the

[10] For a more extended table of this type, confined to nine industrial branches, see *Bulletin 59*, Table 6, p. 15; see also Table 6 below.

TABLE 5

CHANGE IN PERCENTAGE SHARE OF VARIOUS TYPES OF PAYMENT WITHIN EACH INDUSTRIAL BRANCH

		COMPENSATION OF EMPLOYEES			ENTREPRENEURIAL INCOME PAYMENTS			PROPERTY INCOME PAYMENTS		
			Total change in average percentage share from			Total change in average percentage share from			Total change in average percentage share from	
INDUSTRIAL BRANCHES	AVERAGE VOLUME OF ALL INCOME PAYMENTS (*millions of dollars*) 1919-34	Average percentage of all income payments for industry 1919-34	1919-26 to 1927-34	1922-26 to 1927-31	Average percentage of all income payments for industry 1919-34	1919-26 to 1927-34	1922-26 to 1927-31	Average percentage of all income payments for industry 1919-34	1919-26 to 1927-34	1922-26 to 1927-31
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1 Agriculture	6,609	16.3	−1.8	0.0	77.7	+0.4	−0.1	6.0	+1.3	+0.1
2 Mining	1,780	84.1	−4.0	−3.4	1.4	−0.1	−0.2	14.5	+4.2	+3.6
3 Manufacturing	13,960	83.9	−2.9	−3.0	2.3	−0.7	−0.5	13.7	+3.6	+3.6
4 Construction	2,133	80.6	−2.0	+2.9	17.1	+0.8	−3.8	2.3	+1.2	+0.9
5 Transportation and other public utilities	6,535	72.9	−10.5	−6.2	0.1	0.0	0.0	27.0	+10.6	+6.3
a Electric light and power and manufactured gas	981	42.5	−14.0	−8.9	0.3	−0.4	−0.2	57.2	+14.4	+9.1
b Steam railroads, Pullman and express	3,712	78.7	−5.6	−3.7	0.0	0.0	0.0	21.3	+5.6	+3.7
c Pipe lines, street railways and water transportation	1,154	80.2	−3.1	−1.4	0.4	−0.1	+0.1	19.4	+3.2	+1.3
d Communication	688	77.2	−6.5	−2.2	0.0	0.0	0.0	22.8	+6.5	+2.2
6 Trade	8,728	71.2	+1.9	+0.9	24.1	−2.1	−1.7	4.8	0.0	+0.7
7 Finance	7,157	31.6	+7.3	+5.1	42.3	−18.7	−14.1	26.1	+11.4	+9.0
a Banking	871	63.4	+2.8	−1.5	0.0	0.0	0.0	36.6	−2.8	+1.5
b Insurance	924	104.3	−1.4	−2.0	0.0	0.0	0.0	−4.3	+1.4	+2.0
c Real Estate	5,362	13.7	+2.9	+3.3	56.1	−20.8	−15.7	30.2	+18.0	+12.5
8 Government	6,525	77.5	+3.5	+3.5	0.0	0.0	0.0	22.5	−3.5	−3.5
9 Service	8,259	98.4	−0.5	−0.5	[1]	—	—	1.6	+0.5	+0.5
0 Miscellaneous	2,588	90.7	+0.4	−0.8	[1]	—	—	9.3	−0.4	+0.8
Total	64,274	69.8	+1.6	+0.5	17.0	−4.8	−3.0	13.2	+3.3	+2.5

[1] Included with compensation of employees.

country as a whole rose slightly, appears to have sustained a significant decline in a preponderant majority of the industrial categories. Indeed, if we include the subdivisions of public utility and finance, it declined in nine of the fifteen industrial branches distinguished, and rose in only three (trade, government and real estate).

As distinct from the share of employees' compensation, that of entrepreneurial income showed a marked decline, when taken as a percentage of the nation's income payments. The same tendency is observable in Table 5 when the relative proportion of entrepreneurial income is followed within the various industrial divisions. If we include the subdivisions, there are eight industrial branches in which unincorporated enterprises are significant and in which entrepreneurial incomes can be segregated. Of these eight, there is a decline in the relative share of entrepreneurial income in five, and a distinct rise in none. However, in agriculture, the industry that constitutes the most important source of entrepreneurial withdrawals, the share of these withdrawals in total income payments showed no definite decline; indeed, in three of the four sets of periods compared it rose. Obviously, for entrepreneurial incomes as for employees' compensation, the movement in the relative share of the nation's aggregate income payments has been considerably affected by the shift in the relative position of the various industrial branches.

The upward movement in the percentage share of property income occurred in most of the industrial branches distinguished in Table 5. It occurred in as many as twelve of the fifteen; in two, banking and miscellaneous, the general direction of the movement is not quite clear; and in only one, government, does it show a definite downward movement over the period. This evidence of Table 5 does not necessarily mean that the shift in the relative importance of various industries has not contributed to the rising tendency observed in the relative share of property income in the nation's total income payments. But it does indicate that this upward movement would have appeared even had the relative share of each industrial branch remained constant.

The analysis may be pushed to the point of actual measurement of the extent to which the movements in the relative shares of various types of payment in the total have been affected, on the one hand, by changes within the in-

TABLE 6

CHANGE IN PERCENTAGE SHARE OF VARIOUS TYPES OF PAYMENT IN AGGREGATE INCOME PAYMENTS TO INDIVIDUALS TOTAL AND RESULTING FROM INTRA-INDUSTRY SHIFTS IN TYPES OF PAYMENT AND INTER-INDUSTRY SHIFTS IN TOTAL PAYMENTS

TYPE OF PAYMENT	AVERAGE PERCENTAGE SHARE 1919-34	TOTAL CHANGE IN AVERAGE PERCENTAGE SHARE FROM				CHANGE PER YEAR IN AVERAGE PERCENTAGE SHARE FROM			
		1919-26 to 1927-34	1920-26 to 1927-33	1921-26 to 1927-32	1922-26 to 1927-31	1919-26 to 1927-34	1920-26 to 1927-33	1921-26 to 1927-32	1922-26 to 1927-31
Compensation of Employees									
Total (inter- and intra-industry change combined)	69.8	+1.6	+1.1	+0.9	+0.5	+0.2	+0.2	+0.2	+0.1
Due to intra-industry shifts only	69.7	−0.8	−0.8	−0.6	−0.5	−0.1	−0.1	−0.1	−0.1
Due to inter-industry shifts only	69.8	+2.4	+1.9	+1.5	+1.1	+0.3	+0.3	+0.2	+0.2
Entrepreneurial Income Payments									
Total (inter- and intra-industry change combined)	17.1	−4.8	−4.3	−3.7	−3.0	−0.6	−0.6	−0.6	−0.6
Due to intra-industry shifts only	17.1	−2.1	−2.1	−2.1	−1.8	−0.3	−0.3	−0.4	−0.4
Due to inter-industry shifts only	17.0	−2.7	−2.2	−1.6	−1.1	−0.3	−0.3	−0.3	−0.2
Property Income Payments									
Total (inter- and intra-industry change combined)	13.2	+3.3	+3.3	+3.0	+2.5	+0.4	+0.5	+0.5	+0.5
Due to intra-industry shifts only	13.2	+2.9	+2.9	+2.6	+2.3	+0.4	+0.4	+0.4	+0.5
Due to inter-industry shifts only	13.3	+0.4	+0.3	+0.2	+0.2	0.0	0.0	0.0	0.0

dustrial branches (intra-industry shifts), and, on the other hand, by changes in the relative weight of the various industries (inter-industry shifts). If we take the relative shares of each type of payment within each industrial branch, weight them by the *constant* average volume of payments originating in each industrial branch, add the products for each type of payment separately, and obtain the percentage of these sums (one for each type of payment) to the nation's total of individuals' incomes (average volume for the period), these percentages will represent the annual distribution of total income payments affected by *intra-industry* shifts only. If, on the other hand, we take for each industrial branch the varying annual volume for all income payments, apply to these volumes a *constant* percentage of each type of payment (average percentage for 1919-34), add the products for each type of payment separately, and obtain percentages of each sum to the national total, these percentages will represent the percentage distribution of aggregate income payments by type of payment, affected by *inter-industry* shifts only. Such series have been computed and are presented graphically in Chart 4. For each we obtained measures of the movement over the period as a whole. These measures, together with those obtained for the percentages shown in Table 4, are brought together in Table 6. The measures are given for all the sets of periods compared; and include not only the total change from the average of one period to the average of the other period, but also the same changes reduced to a per year basis.

Chart 4

PERCENTAGE DISTRIBUTION OF AGGREGATE INCOME PAYMENTS AMONG MAJOR TYPES OF PAYMENT, 1919-1934

TOTAL AND RESULTING FROM INTRA- AND INTER-INDUSTRY SHIFTS

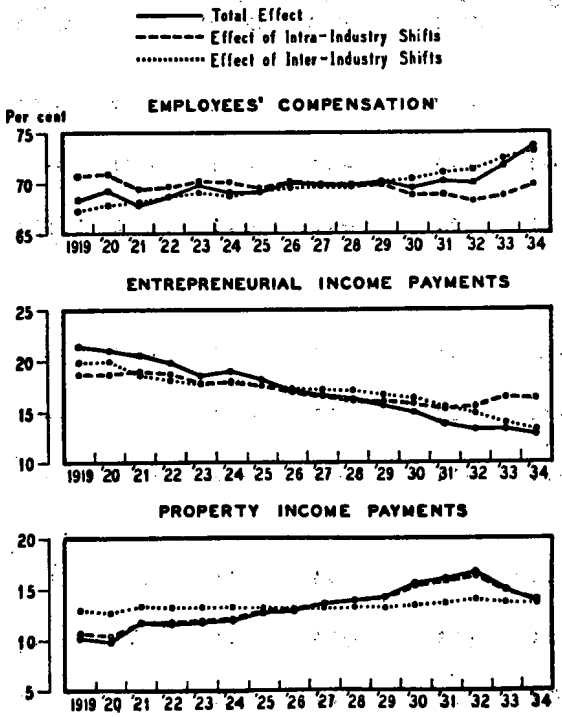


Table 6 shows in a strikingly clear fashion the effects of the two sets of factors on the movements over the period in the relative share of various types of payment. The slight rise in the relative weight of employees' compensation in the national total is seen to be due exclusively to the shift among various industries, i.e., to a net relative gain in the weight of those industrial divisions in which the share of employees' compensation is high. The intra-industrial shift in the relative share of employees' compensation is, on the contrary, distinctly downward. In the general contraction of the relative share of entrepreneurial income the inter- and intra-industrial shifts both exercised effects in the same direction and were almost equally important. The rise of the relative share of property income is also due both to its rise within the various industries and to the shift among industries; but the inter-industrial shifts have in this case exercised less effect.

These conclusions shed light on the changes during the post-War years in the functional and industrial structure of income in this country. The finding with reference to the movement of the share of employees' compensation appears especially significant. It suggests a considerable shift in the distribution of employment and service income among groups attached to various industrial branches, a situation completely concealed by the stability of the relative share of this type of payment when expressed as a percentage of the national total. Obviously such a shift in the composition of employees' compensation, if accompanied by immobility of employment and income among the various industrial groups, might lead to serious problems of social adjustment.

It must again be noted that the shifts observed are in terms of the shares of aggregate income payments measured in dollars of varying purchasing power. If there are any differential changes in prices among goods purchased by the various types of income recipient, and if these differential movements are associated with the changes in the relative shares, the conclusions in terms of the distribution of purchasing power would, of course, be other than those suggested by Tables 5 and 6.

STUDIES IN INCOME AND WEALTH, VOLUME I, BY THE CONFERENCE ON RESEARCH IN NATIONAL INCOME AND WEALTH

The Conference on Research in National Income and Wealth was organized in 1936 with the aim of stimulating cooperative research in the fields of income and wealth,

securing agreement upon the most appropriate concepts and classifications, and directing attention to those segments of the field that demand more primary data or more analytical study. In partial fulfillment of this program, the Conference arranged in 1936 for a series of reports that would deal with the various problems in the field and clear the way either for agreement or for more intensive exploration of the issues. Some of these reports were presented at the December 1936 meetings of the American Economic and the American Statistical Associations; others at the meeting of the Conference proper at the end of January 1937.

At this meeting the Conference recommended the publication of the reports and of the discussion to which they gave rise, subject to review by an editorial committee. This editorial committee (Simon Kuznets, Chairman; Morris A. Copeland and Arthur W. Marget) has reviewed the reports, which were edited by Milton Friedman. They were then submitted as Volume I of the Conference Studies in Income and Wealth for the consideration of the research staff and the Directors of the National Bureau of Economic Research. Their approval now appears assured and the volume will be released probably by the end of October as a publication of the National Bureau (320 pp., $2.50).

The table of contents, indicating the range of topics discussed in the volume, follows.

Foreword

Part

I Concepts of National Income, M. A. Copeland
Discussion: Simon Kuznets
Clark Warburton
M. A. Copeland

II Accounting Methodology in Measurements of National Income, Clark Warburton

III On the Treatment of Corporate Savings in the Measurement of National Income, Solomon Fabricant

IV Changing Inventory Valuations and Their Effect on Business Savings and on National Income Produced, Simon Kuznets
Discussion: M. A. Copeland
A. W. Marget
Milton Friedman
Simon Kuznets

V Public Revenue and Public Expenditure in National Income, Gerhard Colm
Discussion: J. M. Clark
Mabel Newcomer
Simon Kuznets
Gerhard Colm

VI The Distinction between 'Net' and 'Gross' in Income Taxation, Carl Shoup
Discussion: Roy Blough
W. W. Hewett
Carl Shoup

VII Some Problems in Measuring Per Capita Labor Income, Solomon Kuznets

VIII Income Parity for Agriculture, O. C. Stine
Discussion: M. R. Benedict
J. D. Black
O. C. Stine

NATIONAL BUREAU PROJECTS

Bulletin subscribers received a reprint of *A Program of Financial Research,* Volume I, in Bulletin 64. Volume II, an inventory of current projects in the field of banking and finance, was published in July (253 pp., $1.50). Volume I was shown in an exhibition of Trade Books by the New York Book Clinic, under the auspices of the American Institute of Graphic Arts, in June, and Volume II was in its July selection of books notable for excellence of typography. We quote from an editorial in the June 1 issue of the *Journal of Commerce:*

"A New Study of Banking

The Reserve City Bankers' Association, in several ways the most important and influential body of bankers in the country, has taken a very constructive step in sponsoring a comprehensive study of the nation's existing financial system. The far-reaching and profound changes of the depression and recovery periods have come in such rapid succession that few persons have been in position to weigh their full import and significance. Such a research program as the Reserve City Bankers contemplates should furnish a much-needed basis for the evolution of legislative policies and the more intelligent guidance of those who are interested in any way, directly or indirectly, in banking.

At the same time, it is exceedingly important that this research project avoid the serious pitfalls into which several other very ambitious programs of the kind have fallen. The mere gathering of statistical material would be a futile gesture. It is to be hoped that this study will avoid the sterile kind of research which concludes that because credit expanded over a period of years by a given average percentage, that a further increase at that rate would not be "unsound." One study of banking during the post-war decade consisted largely of this type of sterile reasoning, and as a result its value as a contribution to a solution of pressing banking problems proved nil.

Whereas in Canada the practice is followed of having a decennial revision of the Bank Act to bring it up to date and eliminate any weaknesses that have become apparent, banking law in this country has evolved quite haphazardly. As a result, there is urgent need for a codification of statutes and the simplification of our whole system of regulation and examination. The study of the Reserve City Bankers'

Association, under the direction of the National Bureau of Economic Research, will furnish an opportunity to lay the groundwork for this essential task also, as well as for the determination of broader lines of banking policy."

Funds are now being raised and it is hoped that plans for specific projects may soon be announced.

Prices in Recession and Recovery, by Frederick C. Mills (561 pp., $4.00) was also included in the New York Book Clinic exhibition and was among the books recommended in January by the Book-of-the-Month Club. The current issue of the *Journal of the American Statistical Association* says:

"The latest volume written by Professor Mills adds new and valuable data to the store of knowledge to which he has already contributed rich findings. The survey of price data through a peculiarly interesting period in American economic life cannot be ignored by any serious student in the field and will be of immense value to all those working on this type of problem.

The material contained in the book is many-sided and various. The chapter headings give some indication of the scope of the work, but, to gain a more exact impression, it would be necessary to consider the very suggestive subheadings to know the nature of the analysis. The first major division covers the pre-recession situation, recession and depression, and recovery. The angle of approach shifts then to take up in somewhat more detail the special aspects of the recovery of prices, including the fortunes of primary producers, manufacturing industries, manufactured goods and raw material, capital equipment, consumers' goods, and increasing productivity.

. . . . . .

A long statistical appendix and many exhibits included in the text at various points give relatives and indices of such importance that they would have sufficed to justify the work involved without the interesting commentary and comparisons made by Professor Mills.

. . . . . .

Professor Mills has done a real service in giving us not only a new store of facts but also in putting his ideas and interpretations before us."

Ebb and Flow in Trade Unionism, by Leo Wolman (251 pp., $2.50)

"Dr. Wolman's book is a sequel to his *Growth of American Trade Unionism, 1880-1923,* and well maintains the high standard set by his previous writings. . . . His discussion is admirably impartial." *Economist* (London), January 23, 1937.

"This study by Dr. Wolman provides a handbook of information on trade union membership in the United States. An analysis of the rise or decline in total membership in successive periods during the years 1897 to 1935 is followed by a description of changes in unionized fields of activity, and by an attempt to measure the extent of unionization in different occupations and trades. A series of appendices present data showing the membership of individual unions, the percentage represented by union membership in the principal industrial groups, a reclassification of census figures to indicate the distribution of the working population among the various occupations, and trade union memberships in selected foreign countries." *Conference Board Bulletin,* November 2, 1936.

The National Bureau of Economic Research was organized in 1920 in response to a growing demand for scientific determination and impartial interpretation of facts bearing upon economic and social problems. Freedom from bias is sought by the constitution of its Board of Directors without whose approval no report may be published. Rigid provisions guard the National Bureau from becoming a source of profit to its members, directors or officers, or from becoming an agency for propaganda.

Officers

JOSEPH H. WILLITS, Chairman
GEORGE SOULE, President
DAVID FRIDAY, Vice-President
SHEPARD MORGAN, Treasurer
JOSEPH H. WILLITS, Executive Director
MARTHA ANDERSON, Editor

Directors at Large

CHESTER I. BARNARD, *President, New Jersey Bell Telephone Company*
HENRY S. DENNISON, *Dennison Manufacturing Company*
GEORGE M. HARRISON, *President, Brotherhood of Railway and Steamship Clerks*
OSWALD W. KNAUTH, *President, Associated Dry Goods Corporation*
HARRY W. LAIDLER, *Executive Director, The League for Industrial Democracy*
L. C. MARSHALL, *Department of Commerce*
GEORGE O. MAY, *Price, Waterhouse and Company*
SHEPARD MORGAN, *Vice-President, Chase National Bank*
BEARDSLEY RUML, *Treasurer, R. H. Macy and Company*
GEORGE SOULE, *Director, The Labor Bureau, Inc.*
N. I. STONE, *Industrial and Financial Consultant*

Directors by University Appointment

WILLIAM L. CRUM, *Harvard*
WALTON H. HAMILTON, *Yale*
HARRY JEROME, *Wisconsin*
HARRY ALVIN MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
JOSEPH H. WILLITS, *Pennsylvania*

Directors Appointed by Other Organizations

FREDERICK M. FEIKER, *American Engineering Council*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
MALCOLM MUIR, *National Publishers Association*
WINFIELD W. RIEFLER, *American Statistical Association*
GEORGE E. ROBERTS, *American Bankers Association*
MATTHEW WOLL, *American Federation of Labor*

Research Staff

WESLEY C. MITCHELL, *Director*

ARTHUR F. BURNS
SOLOMON FABRICANT
SIMON KUZNETS
FREDERICK R. MACAULAY
FREDERICK C. MILLS
LEO WOLMAN

EUGEN ALTSCHUL, DAVID L. WICKENS, *Associates*

X :951.73.N4 TUFTS COLLEGE
G8 LIBRARY

National Bureau of Economic Research

BULLETIN 71

NOVEMBER 27, 1938

1819 BROADWAY, NEW YORK

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Hours of Work in American Industry

LEO WOLMAN

Copyright 1938, National Bureau of Economic Research, Inc.

It is a commonplace of the economic history of industrial countries during the last century that the hours of work of nearly all classes of employees have been radically and progressively reduced. In 1851 the union of newspaper compositors in New York City recommended to the newspaper industry of that city a work week of six 12-hour days, or 72 hours[1]; in 1938 their week was 37½ hours. Within the last century the printer's week was thus reduced almost one half, the shortening by 34½ hours representing more than four 8-hour days. Employees in blast furnaces were expected to work a full time week of 84 hours as late as the turn of the last century, and have since seen their hours reduced to 40. From 1890 to 1937, a period during which records of hours of work have tended to become more complete and, on the whole, more reliable, the average length of the work week of factory employees in the United States declined from 60 to probably 42 hours, or 18 a week; of labor in the building trades from 55 to 39, or 16 a week; of steam railroad employees from 60 to 48, or 12 a week; and of anthracite and bituminous coal miners from 60 to 35, or 25 hours a week.

A full account of the decline in the length of the working week and the circumstances attending it is not available and cannot be had without considerable research extending back to the early history of American industry. From the historical records it appears that the reduction was at first gradual and cumulative. Since 1890, however, there have been two periods in which considerable cuts in hours were made during relatively brief spans of time. The first was during the World War, 1914-20, when the average full time hours of factory employees declined from 55.1 to 51.0 a week; the second was the recent, and in this respect more spectacular, period of the N.R.A., 1933-35, when the average length of the prevailing work week in manufacturing industries was reduced by approximately 8 hours, from roughly 50 to about 42 hours.

The factors that help to explain and are responsible for these changes in working hours are many. Reductions in hours during the World War, and in similar periods of intense business activity, were in part the result of competition among industries for labor. For in such periods concessions in hours, like increases in wage rates, reflected the state of the labor market. Throughout their history, also, organized labor movements of all types have consistently advocated shorter work days and weeks. In trade union doctrine arguments for the reduction of hours have always occupied a central position—in part because the unions wished to give their members relief from the drudgery of labor and to win for them greater leisure, and, chiefly, because most unions saw in fewer per capita hours an approach to the solution or, at any rate, mitigation of the problem of unemployment. While, therefore, the gains in this direction were often made in years of prosperity when business was good and employment full and the added costs could be most readily absorbed, the incentive to reduce hours received its impetus in the antecedent period of depression and unemployment.

With the passage of time the reasons for a shorter working period became more elaborate and refined and the conditions under which concessions in hours might be granted apparently more frequent and widespread. The observed increase in per capita and man-hour output in the decade 1919-29 produced important revisions in both lay and professional opinion as to the function and benefits of progressively shorter periods of work. The American Federation of Labor, regarding the increased productivity of industry as a cause of the displacement of labor and, hence, of an increasing rate of unemployment, saw in the reduc-

[1] 'Scale of Prices of the Printers Union of the City of New York', proclaimed February 1, 1851, in History of Wages in the United States from Colonial Times to 1928, U. S. Bureau of Labor Statistics, *Bulletin 499* (October 1929). The prices and schedules of hours that were covered in this document were proclaimed by the union, but there is no evidence that they were accepted and, hence, enforced by employers. There is reason to think, therefore, that the hours actually worked by newspaper compositors in New York City in 1851 may have exceeded 72 a week.

Table 1

Major Categories of Industry

Average Full Time Hours of Work per Week, 1890-1937

Year	Manufacturing Industries: Census of Manufactures[1]	Manufacturing Industries: National Industrial Conference Board[2]	Manufacturing Industries: Dept. of Commerce and Labor[4]	Building Trades[5]	Steam Railroads[6]	Coal Mining: Anthracite, union hours[8]	Coal Mining: Bituminous[9]
1890			59.9	55.2	60.0	60.0	60.0
1891			59.8	54.8	60.0	60.0	60.0
1892			60.0	54.3	60.0	60.0	60.0
1893			59.7	54.2	60.0	60.0	60.0
1894			59.3	54.3	60.0	60.0	60.0
1895			59.6	54.0	60.0	60.0	60.0
1896			59.5	53.8	60.0	60.0	60.0
1897			59.4	53.6	60.0	60.0	60.0
1898			59.6	53.3	60.0	60.0	52.8
1899	59.6		59.4	52.6	60.0	60.0	52.7
1900			59.1	52.0	60.0	60.0	52.6
1901			58.8	51.0	60.0	60.0	52.4
1902			58.5	50.2	60.0	60.0	52.3
1903			58.0	50.3	60.0	54.0	52.2
1904	57.9				60.0	54.0	51.7
1905					60.0	54.0	51.8
1906					60.0	54.0	51.7
1907				47.4	60.0	54.0	51.6
1908				46.7	60.0	54.0	51.7
1909	56.8			46.0	60.0	54.0	51.6
1910				45.5	60.0	54.0	51.9
1911				45.3	60.0	54.0	51.8
1912				45.2	60.0	54.0	51.9
1913				45.1	60.0	54.0	51.7
1914	55.1	54.9		44.9	60.0	54.0	51.8
1915				44.9	60.0	54.0	51.8
1916				44.7	60.0	48.0	51.9
1917				44.6	60.0[7]	48.0	49.7
1918				44.3	.....[7]	48.0	48.7
1919	50.8			44.1	48.0[7]	48.0	48.4
1920		49.9		43.9	48.0	48.0	48.2
1921	50.3	49.6		43.9	48.0	48.0	48.2
1922		49.9		43.9	48.0	48.0	48.4
1923	51.1	49.9		43.9	48.0	48.0	48.4
1924		49.7		43.9	48.0	48.0	48.5
1925		49.8		43.9	48.0	48.0	48.5
1926		49.8		43.8	48.0	48.0	48.4
1927		49.5		43.7	48.0	48.0	48.5
1928		49.6		43.5	48.0	48.0	48.5
1929	50.6	49.6		43.1	48.0	48.0	48.5
1930		48.6		41.9	48.0	48.0	48.5
1931		48.0		41.4	48.0	48.0	48.5
1932		47.9		40.6	48.0	48.0	48.6
1933				40.5	48.0	48.0	40.0
1934				39.0	48.0	48.0	35.1
1935				38.7	48.0	48.0	35.1
1936				38.7	48.0	48.0	35.1
1937		40.8[3]		38.9	48.0	35.0	35.0[10]

[1] Figures for 1909-29 computed from frequency distributions published in the U. S. *Census of Manufactures* for the various years; 1899 and 1904 from Paul F. Brissenden, *Earnings of Factory Workers, 1899-1927*, (U. S. Census Monograph X, 1929), p. 354.

[2] Covers 24 manufacturing industries; does not include iron and steel.

[3] Not strictly comparable with figures for earlier years; covers 27 industries, iron and steel, petroleum refining and cement having been added in 1937 to the original 24.

tion of the work week the most effective means of returning the unemployed to employment. At the same time the view became more generally accepted that the expanding output of 'mass-production' industries could be absorbed only by members of a working population who enjoyed more leisure and higher rates of pay.

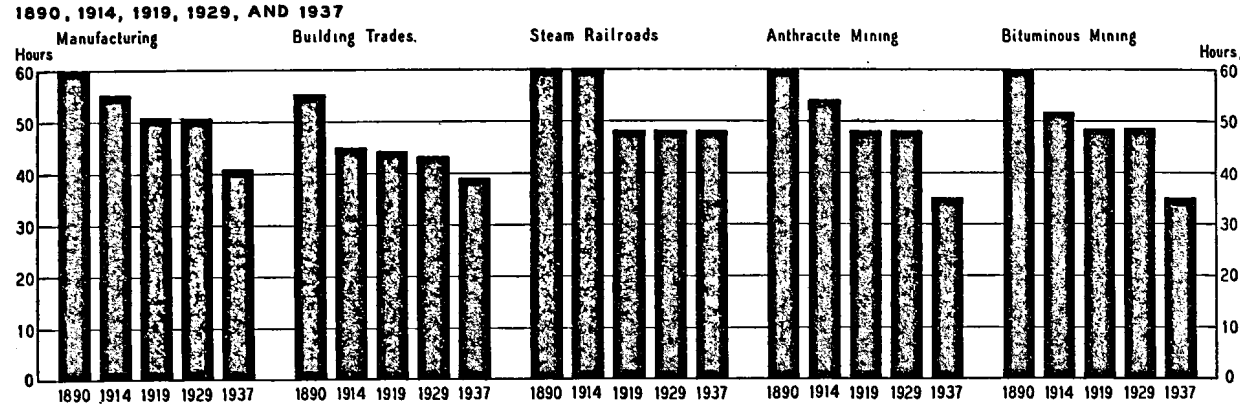
The onset and unfolding of the depression of 1929-32 again shifted the emphasis to the value of reduced schedules of hours as a direct attack on the problem of unemployment. Organized labor continued with greater vigor than previously its campaign for a shorter work week, although it was then not strong enough to make its policies prevail. Employers, likewise, faced by the unusual shrinkage in employment that marked the years 1930-33, turned to this measure as a device for spreading such employment as there was among as many employees as possible and, as a temporary expedient at least, accepted the view that fewer per capita hours meant more men employed. Some prominent employers, in fact, organized a national committee to encourage the adoption of shorter schedules of work. Through their initiative the 'share-the-work' movement assumed substantial proportions and, because of it, work spreading was probably more extensively practiced in this than in earlier depressions of this country.

Chart I

MAJOR CATEGORIES OF INDUSTRIES

AVERAGE PER CAPITA FULL TIME HOURS OF WORK PER WEEK

1890, 1914, 1919, 1929, AND 1937



(Footnotes to Table 1 concluded)

[4] Averages, weighted by number of employees covered, computed from figures published in the *Nineteenth Annual Report* of the U. S. Commissioner of Labor (1904), covering 456 occupations in 48 industries.

[5] Figures for 1890-1903 are averages, weighted by number of employees covered, computed from data for 19 individual occupations published in the *Nineteenth Annual Report* of the U. S. Commissioner of Labor (1904). It is not reported whether these are union or non-union hours, but probably they actually represent the levels of hours established by the unions. Figures for 1907-37 are computed from index numbers of average union hours of work in the building trades published by the U. S. Bureau of Labor Statistics in the *Monthly Labor Review,* November 1937, p. 1186.

[6] Estimated by assuming a 10-hour day, 1890-1917, an 8-hour day, 1919-37, and a 6-day week throughout.

[7] Prior to federal control, which lasted from December 27, 1917 to March 1, 1920, railroad employees generally worked a 10-hour day (sometimes a 9-hour day). This is subject to the important exceptions (1) that numerous railroads already had working agreements with their shop employees recognizing the 8-hour day, and (2) the basic 8-hour day had been established in 1917 for employees in train and engine service. By a series of regulations during 1918, the 8-hour day was formally extended to cover other classes of railroad labor. See Walker D. Hines, *War History of American Railroads* (Yale University Press, 1928), p. 189.

[8] Figures for 1902-37 compiled from union agreements as given in the *Report of the U. S. Coal Commission, Part II* and in the U. S. Bureau of Labor Statistics, *Monthly Labor Review;* figures for 1890-1901 estimated. The 9-hour day, 6-day week became effective April 1, 1903; the 8-hour day, 6-day week, on April 1, 1916; the 7-hour day, 5-day week, on May 1, 1937.

[9] Figures for 1903-36 computed from data published in the U. S. Bureau of Mines, *Minerals Yearbook, 1937,* p. 823. They refer to hours worked by the mines rather than by the men. Figures for 1890-1902 from Paul H. Douglas, *Real Wages in the United States, 1890-1926* (Houghton-Mifflin Company, 1930), p. 150. The 8-hour day, 5-day week became effective on October 2, 1933; the 7-hour day, 5-day week, on April 1, 1934.

[10] Estimated on the basis of the Appalachian Agreement which became effective on April 2, 1937 and provided for the continuation of the 7-hour day, 5-day week.

These various theories of the relation of employment to the length of the work week were all merged in the principles on which the terms of the National Industrial Recovery Act, adopted June 15, 1933, were based. In the administration of this law, it was assumed that shortening the work week would increase employment, and that raising the rate of wages, or the price of labor, would enhance the aggregate purchasing power of employees and thus give a further fillip to business and, hence, to employment. In accordance with these principles, the Recovery Administration, through the machinery of codes of fair competition, effected a drastic reduction in the hours of work. Although the N.R.A. lasted only two years, this aspect of its policy won wide public approval and the reductions in the work week accomplished by it persisted after its demise in June 1935. Sporadic efforts to return to a longer week were restrained after that date by the increase in the membership and power of labor unions and by the growth of legislation, federal and state, restricting hours of work.

During the long history of reductions in the length of the work week, several factors apparently explain the capacity of industry to absorb the burdens of cost necessarily associated with this trend, since full time hours are rarely reduced materially without concomitant increases in wage rates. The first and most important has been the steady application of capital to American industry and the resulting expansion in the use of machinery in our productive processes. A second has been the improved morale and heightened personal efficiency of labor endowed with greater leisure and fewer hours of work. And a third has been the marked improvements in methods of management, such as have been associated with the development of scientific management since 1890, which have contributed heavily to increasing the productivity of industry. What limits there are or may be to the effectiveness of these factors is a moot question that requires for its answer data on costs more comprehensive and reliable than those now available and a better understanding than we now have of the sources of increased employment.

This *Bulletin* aims to describe the trends in full time hours in the major industries of the United States since 1890. The data are largely drawn from the records of governmental agencies, mainly the United States Census of Manufactures and the various reports of the United States Bureau of Mines and the United States Department of Labor and its predecessors, the Bureau of Labor and the Department of Commerce and Labor. For the years since 1920 some use is made of statistics of actual hours of work, and highly tentative comparisons are ventured between actual and full time hours. To suggest relative standards of working conditions in this and other countries, the average full time hours of work in the United States and in a selected list of foreign countries, based on materials published by the British Ministry of Labour and the International Labour Office at Geneva, are briefly compared at the close of this *Bulletin*.

Table 2

Manufacturing Industries

Percentage Distribution of Wage Earners according to Full Time Hours of Work per Week, 1909-1929[1]

Full Time Hours of Work per Week	Percentage of Wage Earners with Specified Full Time Hours of Work per Week					
	1909	*1914*	*1919*	*1921*	*1923*	*1929*[2]
Under 40	7.9	11.8	12.3	13.7	9.9	0.5
40						2.8
Over 40, under 44						1.0
44						9.3[3]
Over 44, under 48			3.8	4.2	4.5	5.5
48			32.6	33.6	31.7	26.9
Over 48, under 54	7.3	13.5	16.5	18.2	21.9	25.1
54	15.4	25.8	9.0	7.8	8.8	6.3
Over 54, under 60	30.2	22.0	13.8	12.6	14.0	15.1
60	30.5	21.1	9.0	7.4	7.3	7.5
Over 60, under 72	5.2	3.5	3.0	2.5	1.9	
72	1.8	1.5				
Over 72	1.7	0.8				
Total	100.0	100.0	100.0	100.0	100.0	100.0
48 or less	7.9	11.8	48.7	51.5	46.1	46.0
60 or more	39.2	26.9	12.0	9.9	9.2	7.5

[1] Compiled from U. S. Census of Manufactures. Data for establishments having products under $5,000 in value are included for 1909, 1914, and 1919 but not for later years.

[2] Covers only those workers for whom hours of work were reported. Hours were not reported for 1.0 per cent of all wage earners.

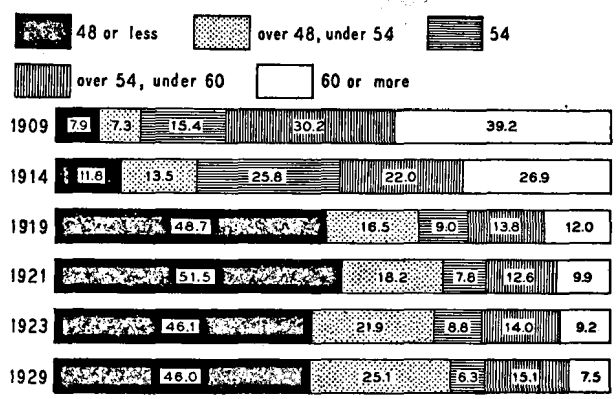
[3] Percentage whose hours were 44 and over, but under 45.

[4] Percentage whose hours were 45 and over, but under 48.

Chart II

MANUFACTURING INDUSTRIES

PERCENTAGE DISTRIBUTION OF WAGE EARNERS ACCORDING TO AVERAGE FULL TIME HOURS PER WEEK 1909 – 1929



Source: U. S. Census of Manufactures

I *Average Full Time Hours in Major Categories of Industry*

Measurement of changes in the hours of labor presents serious difficulties, due at times to obscurities in the definition of hours of work, but more frequently to the lack of reliable and comparable records. Difficulties of definition arise mainly from a persistent confusion between full time and actual hours. The two are not the same. The full time week (variously designated as normal, standard, nominal, scheduled, maximum) may be defined as the number of hours per week beyond which a shop is normally not expected to work. As such the full time week may be regarded as the maximum week. Hours worked in excess of this maximum are prohibited, or are permitted at penalty rates of wages higher than rates prevailing during normal hours, or at prevailing rates under strictly defined and limited conditions of emergency.

In addition to serving the function of specifying the maximum length of the work week, the full time week is one of the several factors on which rates of wages, both time and piece, are based, since most wage rates are fixed at points calculated to yield specified full time weekly earnings. For this reason revisions in schedules of full time hours are commonly accompanied by proportionate revisions in the schedules of wage rates. Accordingly when negotiations are carried on for reductions in hours, it is usually assumed that at least the same weekly wages will be paid for the shorter week. In the administration of the N.I.R.A. the usual procedure observed in the making and administration of codes was to raise the hourly rates of wages sufficiently to compensate employees for losses in hours. While this procedure was not literally applied in every one of the thousands of occupations under the jurisdiction of the Recovery Administration, it was applied to most of them, and average rates of wages in effect after the terms of the codes were in operation reflected this adjustment of wage rates to full time hours.

Actual hours of work rarely coincide with full time hours so defined, and may be expected to exceed full time hours when business is very active, when there is a shortage of labor and overtime is being worked, and to fall short of them when business is dull and labor plentiful. In the long run, actual hours will, in all probability, have the same general trend as full time hours, but deviations of one from the other will occasionally be more or less sharp, depending on the state of business and employment. Because this distinction is not always strictly observed in collecting statistics of hours, there is some evidence that per capita actual hours worked per week are occasionally reported as full time hours. This seems to have been done for some industries during the worst phases of the 1929-32 depression, when considerations of labor cost must have led some industries to lengthen their schedules of full time hours. If such action was taken it is not reflected in the published data and, in consequence, average full time hours during this depression are represented as being at a lower level than they may have been in actual plant practice.

In each of the five major industries for which there is a more or less continuous record, average full time hours per week declined substantially between 1890 and 1937. The reductions ranged from 25 hours a week in the anthracite and bituminous coal industries to 12 hours on steam railroads. At the beginning of this period prevailing hours in all except the building industry were 60 a week. At its end, in 1937, the overwhelming majority of employees in all these industries except railroads had full time weeks of 40 hours or less. On the railroads the 48-hour week still prevailed. This general trend in hours for the period 1890-1937 is shown in Table 1, and for the selected years, 1890, 1914, 1919, 1929, and 1937, in Chart I.

For railroad labor[2] the greatest single reduction in hours was made in the three years 1917-19, when the provisions of the Adamson Act, adopted in 1916, introduced the 8-hour day for train service employees, and orders of the United States Railroad Administration reduced the hours of work of other classes of employees to the same level. In factories there was a gradual decline in hours in the quarter-century from 1890 to 1914, a period during which the total reduction in the work week amounted to 4.8 hours. During the War years, hours were reduced more rapidly, largely because some industries went from the 48- to the 44-hour week, and average full time hours in factories declined, 1914-19, from 55.1 to 50.8, or 4.3 hours a week. During the prosperous years 1922-29 average full time hours of all classes of labor remained remarkably steady and were, except for a slight decline in the hours of building employees, no lower at the end than at the beginning of this period.

The reliability of the record of hours during the depression of 1929-32 is, to say the least, dubious. The re-

[2] The stability shown by the hours of work of railroad employees, 1890-1917, and of coal miners over many years of this whole period is probably due more to the inadequacy of the records than to relative infrequency in the changes in the length of the work week. There is a strong presumption, for example, that the 60-hour week on the railroads was the week worked by most employees, and was not the average full time week of all employees. A report made by the Railroad Wage Commission, April 30, 1918, showed that in December 1917, 64.3 per cent of all railroad employees worked a 6-day week and 35.7 a 7-day week. Furthermore 52.7 per cent worked the 10-hour day, 9.7 the 9-hour day, 4.6 the 11-hour day, 12.9 the 12-hour day, and some 20 per cent the 8-hour day. According to these figures, therefore, the average full time week of railroad employees at that date was 62.2, and not 60 hours. Unfortunately, however, the data required for computing such averages are not available for either railroad or coal mining employees over this period.

Table 3

Bituminous Coal Mining

Percentage of Men Employed in Mines that had Standard Working Days of 7, 8, 9, and 10 hours, and the Average Full Time Working Day and Week, 1903-1937[1]

Year	Percentage of total employees in mines working: 7 hours	8 hours	9 hours	10 hours	Weighted average working day (hours)	No. of working days per week[2]	Estimated full time working week[3] (hours)
1903		56.4	17.1	26.5	8.70	6	52.2
1904		62.1	13.8	24.1	8.62	6	51.7
1905		61.1	13.6	25.3	8.64	6	51.8
1906		63.0	13.5	23.5	8.61	6	51.7
1907		64.0	11.6	24.4	8.60	6	51.6
1908		63.5	11.1	25.4	8.62	6	51.7
1910		62.1	11.3	26.6	8.65	6	51.9
1911		62.9	10.9	26.2	8.63	6	51.8
1912		61.6	11.5	26.9	8.65	6	51.9
1913		61.9	15.2	22.9	8.61	6	51.7
1914		60.7	15.4	23.9	8.63	6	51.8
1915		59.6	17.0	23.4	8.64	6	51.8
1916		58.6	17.4	24.0	8.65	6	51.9
1917		79.0	12.6	8.4	8.29	6	49.7
1918		90.6	6.7	2.7	8.12	6	48.7
1919		95.5	3.5	1.0	8.06	6	48.4
1920		97.1	2.0	0.9	8.04	6	48.2
1921		96.6	2.9	0.5	8.04	6	48.2
1922		95.1	4.0	0.9	8.06	6	48.4
1923		94.7	4.2	1.1	8.06	6	48.4
1924		93.7	5.1	1.2	8.08	6	48.5
1925		93.5	5.4	1.1	8.08	6	48.5
1926		93.7	5.5	0.8	8.07	6	48.4
1927		93.4	5.6	1.0	8.08	6	48.5
1928		93.1	6.1	0.8	8.08	6	48.5
1929		92.5	6.7	0.8	8.08	6	48.5
1930		92.4	6.6	1.0	8.09	6	48.5
1931		93.0	6.1	0.9	8.08	6	48.5
1932		91.9	6.2	1.9	8.10	6	48.6
1933 Before Oct. 2		92.6	4.9	2.5	8.10	6	48.6
After Oct. 2		99.8	0.1	0.1	8.00	5	40.0
1934 After April 1[4]	97.3	2.6	0.1	....[5]	7.03	5	35.2
1935	97.8	2.0	0.2	....[5]	7.02	5	35.1
1936[6]							35.1
1937[7]							35.0

[1] U. S. Bureau of Mines, *Minerals Yearbook, 1937*, p. 823, and *1938*, p. 694. These figures refer to hours worked by the mines rather than by the men. A few mines that worked more than 10 hours or less than 7 hours (less than 8 hours prior to April 1, 1934) have been excluded, as have also all mines for which the reports were defective. Data are not available for 1909. As interpreted in union agreements, the 8-hour day means 8 hours of labor at the usual working place, exclusive of time for lunch and exclusive of time spent in going from the entrance of the mine to the working place and back again.

[2] No data on the number of days worked during a full time week are reported for the early years. It is assumed in the literature that the 6-day week prevailed until October 1933 when the 5-day week was introduced. It is likely, however, and there is some evidence to support this presumption, that some mines were working 7 days a week in the early years of this period and that after the World War some mines were on the 5-day week.

[3] Estimates of the National Bureau of Economic Research. The weighted average working day was multiplied by the estimated number of days worked per week.

ported full time hours of building and factory labor declined slightly from 1929 to 1932, and the hours of work of railroad and coal mining employees remained unchanged. In view of the depths to which business activity descended in this period and the pressure that was exerted to reduce costs either by cutting wage rates or by requiring a longer work week at the same weekly rate, the probabilities are great that the full time work week was, at least in some industries, materially lengthened during the several years of depression following 1929. Certainly in parts of the clothing and textile industries it is commonly believed that hours were raised above their level of the 1920's; and in the building trades there is reason to believe that on some operations the device of the kickback in wages was used together with collusive arrangements for lengthening the work week and waiving penalty rates for overtime work. But if more hours were indeed worked, there is little in the records of either governmental bureaus or the National Industrial Conference Board to confirm this fact.

The figures of full time hours published by the National Industrial Conference Board probably understate somewhat the length of the full time week in manufacturing during the whole period 1920-38 for which they are available. This is partly because the Board's sample is heavily weighted with large establishments and under-represents industry in the South. During the depression, also, the full time hours reported were so low that the Board itself believed that some establishments were confusing full time with actual hours and for this reason discontinued the series from April 1932 to February 1937. For this period, since the Census of Manufactures ceased to tabulate statistics of full time hours with the Census of 1929, governmental data pertain to only a sample of manufacturing industries collected by the United States Bureau of Labor Statistics. Added to these considerations is the possibility that plants working excessively long weeks hesitated to report the fact to either public or private statistical agencies.

Whatever happened during the depression, the following years of recovery saw the greatest reduction in hours of which we have any record in this country. The change occurred in two phases. Under the N.R.A., 1933-35, an effort was made to reduce all hours to 40 or fewer a week. The 40-hour week became the most common work period established in the codes of fair competition. A few industries, principally clothing manufacturing and coal mining, reduced hours to 35 or 36. In many industries, the full time work week averaged somewhat over 40 hours through the year because of allowances for seasonal and other peaks of production. In consequence of these variations average full time hours of factory employees were probably about 42 per week in 1935. Although the first effect of the termination of the N.R.A. in June 1935 was to set in train a movement to revert to a longer work week, it did not gain much momentum. Before it was well started, the spectacular gains of organized labor and the change in the decisions of the United States Supreme Court bearing on the constitutionality of various types of labor legislation, which paved the way for the enactment of federal and state laws regulating the hours of labor, reversed this trend and hours began once more to be reduced. By 1937, consequently, average full time hours were probably fewer than in 1935, if not 1933-34, and for all factory employees slightly exceeded 40 a week.

In respect of hours, as of most other working conditions, there has long been considerable diversity in the practice of American industry. Before the activities of the N.R.A., a prevailing level of hours had rarely been applicable to all the employees in even a single industry. For so heterogeneous a category as manufacturing, which includes hundreds of industries and millions of employees, an average of full time hours is bound to obscure the wide range of hours actually effective and hence to conceal the true incidence of reductions in the length of the work week. How wide this range has been in manufacturing industries and how it has changed over the twenty years 1909-29 for which this type of material is available is shown in Table 2 and Chart II.

The most drastic changes over this whole period apparently took place at the upper and lower ranges of prevailing schedules of hours. Employees working 48 or fewer hours a week increased from 7.9 to 46.0 per cent of total factory employees, and those working 60 or more hours declined from 39.2 to 7.5 per cent of the total. The 54-hour week, or six 9-hour days, tended to apply to a declining fraction of the work-force of manufacturing industry. On the other hand, the proportion employed on the 48-hour week appeared to decline from 1919 to 1929, while the percentage of those working from 48 to 54 hours, presumably on a 50-hour week, increased quite considerably. It may be said that a substantial number of the employees who had their hours reduced to 48 or fewer during the War surrendered a considerable part of their gains during the decade 1919-29.

(Footnotes to Table 3 concluded)

[4] Data as reported for December 1934.

[5] Less than .05 of one per cent.

[6] Reported by the U. S. Bureau of Mines, *Minerals Yearbook, 1938*, p. 694. The distribution of mines by length of work day is not given for this year.

[7] Estimated on the basis of the Appalachian Agreement which became effective on April 2, 1937 and provided for the continuation of the 7-hour day, 5-day week.

When full time hours per week were reduced the reduction was often accomplished by cuts in the length of the working day. Thus, as the number of hours worked per day declined from 10 to 9 and then to 8, the week declined from 60 to 54 and 48. The next reduction was made by introducing the half-holiday on Saturday so that a 44-hour week consisted of five 8-hour days and 4 hours on Saturday. With the introduction of the 40-hour week the number of working days was most usually reduced to 5; and with the 35-hour week the hours per day dropped from 8 to 7.

The way in which this sort of shift occurred is illustrated in changes in the length of the work day and week of bi-

Table 4

Major Manufacturing Industries

Average Full Time Hours of Work per Week, 1890-1929[1]

Industry	Average no. of wage earners employed in 1929[2]	Average Full Time Hours of Work per Week							
		1890	*1899*	*1909*	*1914*	*1919*	*1921*	*1923*	*1929*
Textiles									
Cotton goods	424,916	61.1	61.2	59.4	57.1	53.2	53.0	53.8	54.8
Silk goods	130,467	58.9	57.4	57.2	55.1	49.1	49.4	49.3	50.9
Woolen and worsted goods	146,959	60.1	59.4	57.8	55.4	49.4	49.7	48.5	50.5
Knit goods	208,488	59.9	59.3	58.2	55.1	51.2	51.3	51.3	52.2
Clothing									
Men's clothing[3]	188,069	57.6	57.3	54.6	51.6	45.3	45.3	45.4	45.9
Women's clothing	187,500			53.4	51.5	45.3	45.3	45.4	45.2
Fur-felt hats	16,539	58.1	56.5	53.8	51.6	46.4	47.4	47.9	47.8
Shirts	59,830				53.4	48.4	48.3	48.6	48.6
Foods									
Bread and other baking	200,841	65.6	63.4	58.4	55.9	50.4	50.7	50.6	50.9
Meat packing	122,505	59.7	59.8	58.2	58.1	49.2	48.8	49.5	49.0
Cane sugar refining	13,912		70.6	65.0	62.9	56.3	56.9	54.9	54.8
Canning and preserving[4]	98,866	76.8	76.9	59.5	57.6	55.0	54.4	54.0	52.9
Printing and publishing									
Book and job	150,649	59.0	56.7	50.8	49.3	48.1	46.9		46.3
Newspaper and magazine	129,660	52.4	50.4		50.0	48.5	47.8		47.6
Metals and machinery									
Agricultural implements	41,663	59.6	59.4	57.4	56.3	53.3	51.2	52.5	52.6
Steam railroad cars[5]	368,681	58.6	58.4	56.6	54.8	50.0	50.3	50.2	50.5
Electrical machinery	328,722	57.8	58.2	55.4	54.2	49.6	48.7	49.2	49.4
Foundries and machine shops	454,441	59.5	59.0	56.5	55.1	51.5	50.4	51.4	51.1
Motor vehicles[6]	447,448			57.0	54.5	50.6	49.9	50.3	50.7
Shipbuilding	55,089	58.5	58.2	56.1	53.0	45.4	45.8	47.1	47.5
Structural iron	54,947				55.0	52.0	50.8	51.6	52.4
Leather									
Leather	49,932	59.2	59.3	58.0	57.0	50.8	51.3	51.4	51.5
Boots and shoes	205,640	58.2	57.8	56.5	54.9	49.1	48.9	49.1	49.3
Lumber									
Lumber (sawmills)	419,084	62.7	62.4	59.6	59.8	56.1	56.1	55.8	53.9
Planing mills	90,134	59.1	57.9		55.1	52.6	51.1	51.5	50.4
Furniture	193,399	59.0	58.4	57.7	56.0	55.7	51.7	52.2	51.8
Miscellaneous									
Rubber tires and tubes	83,263						50.2	48.3	47.5
Petroleum refining	80,596		64.7	58.7	58.4	51.4	51.6	51.0	52.7
Cigars and cigarettes	105,308	57.4	57.9	53.9	53.0	50.4	50.0	50.2	50.4
All manufacturing	8,838,743	59.9	59.4	56.8	55.1	50.8	50.3	51.1	50.6

[1] Figures for full time hours per week for 1890 and 1899 are computed from data for individual occupations published in the *Nineteenth Annual Report* of the U. S. Commissioner of Labor (1904); for 1909-29 they are computed from frequency distributions of the total wage earners in each industry published in the *U. S. Census of Manufactures* for each census year.

[2] *U. S. Census of Manufactures, 1929.*

[3] Includes work clothing in all years; includes shirts, 1890-1909.

[4] Covers canning and preserving of fruits and vegetables only.

[5] Covers both construction and repair work.

[6] Includes the manufacture of motor-vehicle bodies and parts.

tuminous coal miners. Table 3 shows the percentage of miners working the 10-, 9-, 8-, and 7-hour day, in each year, 1903-37. More than half worked an 8-hour day in 1903, more than a quarter worked 10 hours a day, and about one-sixth, 9 hours. These proportions remained virtually unchanged until the World War when there began a strong movement toward a universal 8-hour day in coal mines. By 1920, 9- and 10-hour days applied to only 3 per cent of the miners. During the 1920's the tendency to lengthen the work day appeared again, and by 1929 nearly 7 per cent of the miners were on a 9-hour day. This tendency apparently persisted during the depression, 1929-32, and is confirmed by the slight increase in the proportion of miners who had returned to 10 hours during 1932. The effect of the N.R.A. and of collective agreements between the United Mine Workers and coal operators appears in the virtual elimination of the 9- and 10-hour days in October 1933. The next and latest change, made April 1, 1934, replaced the 8- with the 7-hour day and after that date 97 per cent of the miners worked a 35-hour week of five 7-hour days.

It is clear from these data also that changes in average full time hours worked in an industry do not usually affect all employees. Thus when there was the substantial reduction in average hours, 1916-20, from 51.9 to 48.2 a week, nearly 60 per cent of the miners, who were already on an 8-hour day in 1916, failed to profit from this change. But the considerable number of miners who passed from the 10- to the 8-hour day in this period gained 2 hours a day, or 12 a week. Only when virtually the entire industry changed from a 6- to a 5-day week, as in 1933, and from an 8- to a 7-hour day, as in 1934, did the great majority of employees share simultaneously in the reduction in hours.

The wide range observed in the dispersion of hours in manufacturing industry as a whole is, of course, in part accounted for by the great diversity in hours among the major industries that comprise the whole category of manufacturing. Average full time hours in the most important of these industries, exclusive of iron and steel, are shown in Table 4 for selected years, 1890-1929. During these 40 years hours were reduced in all these industries. The greatest reduction, 24 hours a week, was in canning and preserving where the week was longest in 1890. For nearly all these industries, the most substantial reduction in the shortest time took place in the War years, 1914-19. Between 1919 and 1929 the week was lengthened, although slightly, in about half of the industries. Only in the printing and publishing, cane sugar refining, canning and preserving, lumber, and furniture industries were hours appreciably fewer in 1929 than in 1919. Apparently the longest average full time week in 1929 in these industries was 54.8 hours in cotton goods and cane sugar refining, although lumber mills followed closely with a week of 53.9 hours.

At the same time the range of variation in hours tended to become appreciably narrower. In 1890 when the most common work week in manufacturing was about 60 hours, the difference between the longest week, 77 hours in canning and preserving, and the shortest, 52 in newspaper and magazine printing, was 25 hours. In 1929 when the most usual full time week for factory employees was about 50 hours, the range had declined to roughly 10 hours, from 55 hours in the cotton goods and cane sugar refining industries to 45 in women's clothing.

The case of iron and steel merits special attention because of the persistence in it of the 12-hour day and the striking reduction in hours that followed its abandonment. The average length of the full time work week is shown for the iron and steel industry and its major subdivisions, 1890-1929, in Table 5. The movement of hours in this industry reveals several peculiarities. Over the whole period 1890-

Table 5

Iron and Steel Industry

Average Full Time Hours of Work per Week, 1890-1929[1]

	1890	*1899*	*May 1914*	*May 1915*	*Oct. 1920*	*Oct. 1922*	*Jan. 1924*	*Jan. 1926*	*Mar. 1929*
All departments	66.6	65.8	64.9	65.5	63.1	63.2	55.2	54.4	54.6
Blast furnaces	84.0	84.0	74.8	74.9	72.1	72.3	59.7	59.8	60.7
Bessemer converters	63.1	64.8	68.4	68.7	70.3	68.7	52.3	52.6	53.7
Open-hearth furnaces	73.0	72.1	74.5	74.4	68.7	70.8	58.0	57.1	57.7
Puddling mills	57.8	58.3	53.2	52.2	53.9	52.1	55.7	52.1	50.3
Blooming mills	64.6	61.3	70.5	71.0	67.5	68.0	54.6	54.2	55.0
Plate mills			69.0	69.8	68.8	66.2	57.2	55.8	58.0
Rail mills	59.3	65.2	70.1	70.9	61.2	61.5	57.4	55.5	56.0
Bar mills	65.9	61.4	61.7	61.4	61.8	61.2	55.6	54.7	55.6
Sheet mills			52.3	52.5	50.3	51.1	50.2	48.9	48.9
Tin-plate mills		56.8	46.0	50.4	50.6	49.9	48.8	48.1	47.4

[1] Figures for 1890 and 1899 are computed from data for individual occupations published in the *Nineteenth Annual Report* of the U. S. Commissioner of Labor (1904). Figures for 1914-29 are based on special studies of the U. S. Bureau of Labor Statistics and appear in *Bulletin 513*.

1929 average hours declined by 12 a week, somewhat more than the decline for all manufacturing. Between 1890 and 1914 the reduction was very slight, less than 2 hours a week. During the War the drop in hours in this industry was again much less than in most others. But from 1922 to 1924, when average full time hours in factories remained stable, they were sharply reduced in iron and steel; they fell from 63.2 to 55.2 hours, or 8 a week. This reform was the result of rising public disapproval of the continuance of the 12-hour day in steel mills and a decision reached by most of the industry in 1923, after conferences between its leaders and President Harding, to begin the abandonment of this excessively long work day. The effect of this decision is most striking in the reduction in the full time hours of blast furnaces from 72.3 a week in 1922 to 59.7 in 1924.

Since the full time week, as reported by official and non-official agencies, did not vary much between 1929 and 1933, some idea of the incidence of reductions in hours made under the N.R.A., 1933-35, can be had by examining the dispersion of hours in 1929. Table 6 shows the distribution of wage earners according to full time hours per week in major divisions of manufacturing in 1929. In the cotton goods industry, where maximum hours per week were fixed by the Code of Fair Competition at 40, only 1.2 per cent of the employees were working a 40-hour week or less in 1929. In fact 98 per cent of cotton textile workers were working 45 or more hours per week, while 63 per cent were working more than 54 hours. For most employees in this industry, therefore, the introduction of the 40-hour week meant a reduction of at least 14 hours a week. The same thing was more or less true in the iron and steel and lumber industries, while the reduction was even greater in petroleum refining, which went to a 36-hour week under the N.R.A. In many other industries, most of the employees had work weeks ranging from 45 to 54 hours, and for the majority the 40-hour week amounted to a reduction of 8 or 10 hours a week. Only in the clothing, printing and publishing, shipbuilding, motor vehicle, and rubber tire industries was there a substantial number who were already on weekly schedules of less than 45 hours. For that part of this group of employees which went to a 40-hour week, the reduction was on the whole moderate. But in the two great divisions of the clothing industry, men's and women's clothing, where maximum hours were fixed by the codes at 36 and 35 respectively, those employees who were on a 44-hour week in 1929 gained by the change 8 and 9 hours a week.

Because the Census of Manufactures ceased to tabulate and publish data on full time hours in all its reports after 1929, we must depend for the record of the years since on fragmentary and occasional data reported by the United States Bureau of Labor Statistics, the Codes and Reports of the N.R.A., and a monthly series, purporting to be full time hours, published by the National Industrial Conference Board, for 1914, 1920-32, and now currently reported since February 1937. All these series, however, are substantially in accord, at least with respect to the stability of hours, 1929-33, and the amount of the reduction in the length of the full time work week between 1933 and 1937. Perhaps the best summary of the course of hours in manufacturing during the depression 1929-32 can be derived from the special reports of the United States Bureau of Labor Statistics. The movement of full time hours in selected industries, 1928-34, as reported in these special studies, is shown in Table 7.

While this is a small group of industries, it is a representative one and is not untypical of manufacturing as a whole. In the important iron and steel industry the full time week declined slightly during the depression, as it apparently did also in the motor vehicle and sawmill industries. In the rest, it either remained stationary or registered fractional increases.

For the period of the N.R.A., aside from the provisions of the codes themselves, no comprehensive statistics of average full time hours are available. A few of the special studies by the United States Bureau of Labor Statistics included in Table 7 show how precipitate was the drop in hours consequent to the adoption of codes, and suggest how general, within those industries, was the incidence of reduced hours. Thus average full time hours in the silk and rayon industry dropped from 50.9 in April 1933 to 39.8 in August; in dyeing and finishing, hours were 51.9 in July 1933 and 40.4 in August.

Table 8 shows the distribution of codes according to the full time work week specified for factory or 'general' workers. Thus 85 per cent of the codes provided for either a straight maximum of 40 hours or for a maximum of 40 hours exceeded during a limited portion of the year. How much these tolerances affected the average full time week in industries for which they were allowed is not known, but occasional studies made by the Recovery Administration show that the average full time week in this class of industry was not much in excess of 40 hours.

After the N.R.A., the National Industrial Conference Board series alone remains. Since it is well known that the hours of factory employees have tended to decline with the recent revival of trade unionism and the adoption of laws regulating hours of labor, the average full time hours reported by this agency may be used with some degree of confidence. They probably reflect with reasonable accuracy the current course of full time weekly hours in manufacturing, although they probably understate the level of such hours by a small amount, perhaps by 1 or 2 hours a week.

II Regional Differences in Full Time Hours

The wide diversity in wage rates and other standards of working conditions in the various regions comprising the continental area of the United States finds its counterpart in persistent differences in the length of the work week. While the observed decline in average full time hours in the whole country, 1899-1929, occurred in all geographical areas, it was greater in some than in others, and differences persisted throughout this period. Table 9 shows average full time hours in manufacturing industries, 1899-1929, by geographical areas.

In 1899 the shortest week (58.5 hours) prevailed in New England and the longest (62.8) in the West South Central States, the range being 4.3 hours per week. By 1919 the

Table 6

Selected Manufacturing Industries

Distribution of Wage Earners according to Full Time Hours of Work per Week, 1929[1]

Industry	Percentage of Wage Earners whose Full Time Hours of Work per Week were: not reported	40 and under	over 40, under 45	45 to 48, inclusive	over 48, not over 54	over 54
Textiles						
Cotton goods	0.0	1.2	0.5	21.3	13.6	63.4
Silk goods	0.0	0.5	13.5	23.1	47.7	15.3
Woolen and worsted goods	0.0	0.1	1.6	50.7	36.6	10.9
Knit goods	0.0	0.4	3.9	26.7	42.1	26.8
Clothing						
Men's clothing[2]	2.4	7.5	61.2	16.5	11.8	0.7
Women's clothing	2.1	17.7	45.3	22.1	12.5	0.2
Fur-felt hats	0.0	4.3	28.2	37.0	29.5	1.0
Shirts	0.7	1.0	23.4	37.0	36.8	1.1
Foods						
Bread and other baking	3.9	0.9	4.5	39.5	35.4	15.9
Meat packing	0.0	1.7	8.1	67.2	13.8	9.2
Cane sugar refining	0.0	0.0	0.0	20.7	18.7	60.5
Canning and preserving	1.5	4.6	3.7	20.9	32.5	36.8
Printing and publishing						
Book and job	2.1	0.8	44.6	47.0	5.2	0.2
Newspaper and magazine	4.5	0.9	19.2	66.7	7.4	1.4
Metal and machinery						
Agricultural implements	0.4	0.1	2.8	2.4	78.5	15.8
Steam railroad cars[3]	0.0	3.4	6.3	59.8	0.7	29.8
Electrical manufacturing	0.2	0.2	5.2	59.2	31.7	3.5
Foundries and machine shops	0.5	1.9	7.9	25.6	47.0	17.1
Iron and steel	0.0	3.2	5.4	38.5	11.5	41.4
Blast furnaces	0.0	0.0	0.0	0.0	40.4	59.6
Steel works and rolling mills	0.0	3.5	5.8	38.4	12.2	40.2
Motor vehicles, incl. bodies and parts	0.0	13.0	2.2	6.4	67.1	11.4
Motor vehicles	0.0	19.6	1.8	6.9	68.6	3.1
Motor-vehicle bodies and parts	0.0	6.1	2.6	5.8	65.5	19.9
Shipbuilding	0.4	0.1	31.9	49.1	17.5	1.2
Leather						
Boots and shoes	0.1	2.3	8.4	45.9	41.1	2.1
Leather	0.0	1.1	4.2	8.8	80.2	5.7
Lumber						
Lumber (sawmills)	7.5	3.8	1.1	22.7	11.5	53.4
Planing mills	1.6	5.3	20.0	18.5	31.0	23.6
Furniture	0.5	3.8	9.0	13.2	48.3	25.2
Miscellaneous						
Rubber tires and tubes	0.0	1.1	23.9	66.3	6.0	2.6
Petroleum refining	0.0	0.0	0.3	51.9	1.6	46.2
Cigars and cigarettes	0.5	2.7	10.4	24.2	52.4	9.7
All manufacturing	1.0	3.2	10.1	32.1	31.2	22.4

[1] Computed from data published in the *U. S. Census of Manufactures, 1929.*

[2] Does not include work clothing.

[3] Covers both construction and repair work.

Table 7

Average Full Time Hours of Work per Week, Selected Manufacturing Industries, 1928-1934,[1] and Basic Maximum Hours of Work per Week under the Codes of Fair Competition, 1933-1935

Industry	Average Full Time Hours of Work per Week								Basic Maximum Hours under Codes of Fair Competition
	1928	*1929*	*1930*	*1931*	*1932*	*1933*		*1934*	*1933-1935*
Textiles									
Cotton goods	53.4		53.4		53.4				40
Silk and rayon goods				50.7		Apr. 50.9	Aug. 39.8	Aug. 39.7	40
Hosiery and knit underwear	51.3		51.7		51.6				40[5]
Hosiery	52.1		52.2		51.9				40
Knit underwear	50.0		50.3		50.7				40[5]
Woolen and worsted goods	49.3[2]		49.6		50.3		Aug. 40.1	Aug. 40.1	40
Dyeing and finishing textiles			50.9		51.3	July 51.9	Aug. 40.4	Aug. 40.2	40[6]
Clothing									
Men's clothing[3]	44.0		44.3		44.4				36
Foods									
Cake baking				51.0					40
Bread baking				54.9					40
Slaughtering and meat packing		49.2		49.2					
Cane sugar refining			58.7						
Metal and machinery									
Iron and steel, all departments		54.6		52.4		Mar. 51.5			40[7]
Blast furnaces		60.7		57.2		Mar. 55.1			40[7]
Bessemer converters		53.7		53.3		Mar. 52.7			40[7]
Open-hearth furnaces		57.7		53.8		Mar. 53.3			40[7]
Puddling mills		50.3		53.0		Mar. 52.8			40[7]
Blooming mills		55.0		52.6		Mar. 52.5			40[7]
Plate mills		58.0		56.7		Mar. 53.5			40[7]
Rail mills		56.0		54.9		Mar. 53.2			40[7]
Bar mills		55.6		55.0		Mar. 54.1			40[7]
Sheet mills		48.9		47.8		Mar. 46.9			40[7]
Tin plate mills		47.4		47.0		Mar. 46.9			40[7]
Motor vehicles[4]	49.4		48.8		48.4				40[8]
Foundries		51.0		50.3		Apr.-Je. 49.5			40[9]
Machine shops		50.3		49.8		Apr.-Je. 48.5			40[9]
Leather									
Boots and shoes	49.1		48.9		48.9				40[10]
Leather					50.4				40[11]
Lumber									
Furniture		51.9		51.8					40[12]
Sawmills	56.6		56.5		55.8				40
Miscellaneous									
Portland cement		60.8			59.0				36[13]
Glass					50.2				36&40[14]
Rayon and allied products			50.2		48.2				40[15]
Cigarettes			49.9						40
Petroleum refining		48.8				May 41.2	Nov. 35.9	May 36.0	36[16]

[1] Compiled from the reports of special studies made by the U. S. Bureau of Labor Statistics. The figures are averages for periods of a month or more within the year, chosen by the Bureau as representative of that year, not averages for the year.

[2] Covers Northern mills only.

[3] Does not include work clothing.

[4] Does not include the manufacture of motor-vehicle bodies and parts.

[5] The Underwear and Allied Products Manufacturing Code limited hours to 40 a week with a 10 per cent tolerance for emergency work.

[6] The Rayon and Silk Dyeing and Printing Code provided for a maximum week of 40 hours with no more than 8 hours additional a week for productive employees engaged in continuous chemical processes. The Textile Processing Code limited hours to 40 a week averaged over 12 months, a maximum of 48 a week to be allowed in 20 weeks only.

[7] The provisions of the Iron and Steel Code as to maximum hours of work were: not over 40 hours a week average in any 6-month period; not over 48 hours, or more than 6 days, in any one week. On May 30, 1934 the Code was amended to specify a maximum of 8 hours of work a day.

shortest week (47.5 hours) prevailed in the Pacific States, the longest (55.3 hours) in the East South Central States, and the range had increased to 7.8 hours, or roughly one working day of 8 hours. In 1929 the work week in the Pacific region was still the shortest (48.6 hours) and in the East South Central area the longest (54.2 hours), but the difference between them had narrowed to 5.6 hours.

A clearer and perhaps more accurate picture of regional differences in hours can be obtained from data showing the distribution of employees by the length of the work week. Table 10 gives the distribution of wage earners in manufacturing industries, 1929, by full time hours and geographical divisions. In the New England, Middle Atlantic, Mountain, and Pacific States more than half of the factory employees in 1929 had full time weeks of 48 hours and less. In the group of southern states, on the other hand, more than half of the employees had full time weeks of more than 54 hours. Weeks of 60 hours and longer prevailed for more than one-fourth of the employees in the East and West South Central States and for about a sixth in the South Atlantic States. Full time hours under 45 a week affected less than 10 per cent of the employees in the southern group, but prevailed for 22.6 per cent in the Pacific, and 18.9 per cent in the Middle Atlantic States.

This state of things had apparently not changed much during the depression of 1929-32. Such changes as took place in average full time hours in manufacturing industries were accompanied by the continuance of wide regional differences. A comprehensive distribution of full time hours by geographical divisions, such as exists for 1929, is unfortunately not available for the years of the depression or thereafter. But a clue to the behavior of the range of hours by regions in this period can be had from studies of several separate industries. Table 11 shows the states or cities having the highest and lowest average full time hours per week in selected manufacturing industries, 1928 and 1932. In most of these industries there appears to have been a tendency for the differences between the longest and shortest week to increase over this period and in several (foundries and woolen and worsted goods) the change was considerable. With the exception of the men's clothing industry, which is localized in the East and Middle West, the shortest week, both in prosperity and depression, appears to have

Table 8

Distribution of Codes of Fair Competition according to Maximum Working Time specified for Factory or 'General' Workers[1]

Maximum number of hours per week	Codes setting specified maximum for factory or 'general' workers	
	Number	Percentage of total
27	1	.2
32	1	.2
35	13	2.3
36	21	3.8
37½	3	.5
38	1	.2
40	148	26.6
40, averaged over various periods	93	16.7
40, with peak allowances	231	41.5
44	10	1.8
45	2	.4
48	13	2.3
52	1	.2
54	1	.2
Combinations of hours averaging:		
under 40	5	.9
40 and over	13	2.3
Total	557	100.0

[1] Compiled from U.S. Bureau of Labor Statistics, *Monthly Labor Review,* March 1935, pp. 584 and 653-5; April 1935, pp. 896-9; and May 1935, pp. 1190-4. Covers all master codes approved except the fur-trapping code which had no hours limitations.

(Footnotes to Table 7 concluded)

[8] The Automobile Manufacturing Code as amended on January 8, 1934 and on January 31, 1935 set a maximum of 48 hours in any one week for all nonmanagerial employees earning less than $35 per week and further limited the average hours, in any 8-month period, of processing employees to 40 hours, and of nonprocessing employees (indirect labor) to 42 hours. The original code, effective August 26, 1933-January 8, 1934, had limited the average hours of processing employees to 35.

[9] The workers in this industry were covered by the provisions of several codes the majority of which provided for a maximum week of either 40 hours or of 40 hours with a tolerance of 8 hours a week for not more than 6 (or 8) weeks in six months. The Laundry and Dry-cleaning Machinery Manufacturing Code limited hours to 36 a week with not more than 72 hours overtime in six months.

[10] The Boot and Shoe Code provided for a 40-hour week with a tolerance of 5 extra hours a week during not more than 8 weeks in six months.

[11] The Leather Code provided for maxima of 40 hours a week averaged over 26 weeks and 8 hours a day.

[12] The Furniture Manufacturing Code limited hours to 40 a week averaged over the period December 11, 1933-April 1, 1934 and each 6-month period thereafter, with a maximum of 45 hours in any one week.

[13] The Cement Code limited hours to 36 a week averaged over one-half the calendar year, with maxima of 42 hours a week and 8 hours a day.

[14] The Glass Container Code limited hours to 40 a week averaged over six months with a maximum of 48 hours in any one week. The Flat Glass Manufacturing and the Window-Glass Manufacturing Codes limited hours to 72 in 14 days with 6 hours a week additional for workers engaged in continuous operations.

[15] The Rayon and Synthetic Yarn Production Code limited hours to 40 a week averaged over four weeks.

[16] The Petroleum Code limited hours to 40 a week, 72 in two weeks, 16 in two days.

Table 9

Manufacturing Industries

Average Full Time Hours of Work per Week by Geographical Divisions, 1899-1929[1]

Geographical Division	Average No. of Wage Earners Employed in 1929[2]	Average Full Time Hours of Work per Week					
		1899[3]	*1904*[3]	*1909*	*1914*	*1919*	*1929*
New England	1,098,514	58.5	56.8	55.7	54.1	49.6	49.8
Middle Atlantic	2,562,340	59.0	57.3	56.2	54.3	49.6	49.4
East North Central	2,542,176	59.5	57.8	56.8	54.8	51.3	50.5
West North Central	474,115	59.3	57.6	56.5	55.2	51.5	50.3
South Atlantic	912,247	61.8	60.1	58.9	57.7	53.5	53.6
East South Central	377,870	62.4	60.6	59.4	57.9	55.3	54.2
West South Central	297,743	62.8	61.0	59.8	58.5	54.9	53.7
Mountain	102,492	60.1	58.3	57.2	55.5	52.0	51.2
Pacific	471,246	59.2	57.5	56.4	54.9	47.5	48.6
United States	8,838,743	59.6	57.9	56.8	55.1	50.8	50.6

[1] Computed from frequency distributions published in the *U. S. Census of Manufactures, 1909, 1914, 1919, and 1929.*

[2] *U. S. Census of Manufactures, 1929.*

[3] Estimated by Paul F. Brissenden in *Earnings of Factory Workers, 1899-1927,* (U. S. Census Monograph X, 1929), p. 355.

prevailed in the Pacific States. The narrowest range in hours in 1928 was in the woolen and worsted goods industry, 4.4 hours, and the widest, 13.2 hours in sawmills. In 1932-33, the narrowest was 6.8 hours in the shoe industry, and the widest, 16 hours in foundries.

No such comparison between 1929 and 1933 can readily be made for the iron and steel industry. But data collected for March 1933[3] show that the full time hours per week in that industry were 49.0 in the Pittsburgh,[4] 56.5 in the Eastern,[5] and 56.4 in the Southern[6] districts.

III Full Time Hours under Union and Non-Union Conditions

With the possible exception of the railroads, where rules regulating the hours of work are peculiar and where the

[3] U. S. Bureau of Labor Statistics, *Monthly Labor Review,* September 1933, p, 653.

[4] Pittsburgh, Western Pennsylvania, borderline of Ohio from Youngstown south to Bellaire, and panhandle of West Virginia.

[5] New Jersey and Delaware, and eastern parts of New York, Pennsylvania, and Maryland.

[6] Virginia, Tennessee, Kentucky, Alabama, Georgia, and borderline on the Ohio River south and west of Bellaire.

Table 10

Manufacturing Industries

Distribution of Wage Earners by Full Time Hours of Work per Week, by Geographical Divisions, 1929[1]

Geographical Division	Percentage of Wage Earners Whose Full Time Hours of Work per Week were:								
	40 and under	over 40, under 44	44 and over, under 45	45 and over, under 48	48	over 48, under 54	54	over 54, under 60	60 and over
New England	1.9	0.9	5.4	4.7	41.0	26.5	9.4	8.9	1.4
Middle Atlantic	4.2	2.1	12.6	7.3	28.4	24.4	6.6	10.3	4.0
East North Central	3.2	0.4	8.9	5.4	20.0	38.4	5.2	13.8	4.7
West North Central	3.3	0.3	11.3	7.3	28.4	20.3	9.6	11.2	8.2
South Atlantic	2.9	0.4	4.4	4.2	16.0	12.8	3.1	38.8	17.4
East South Central	2.8	0.1	2.3	2.2	16.1	15.9	4.2	30.2	26.2
West South Central	2.8	0.5	4.5	3.1	20.8	10.2	7.0	21.3	29.9
Mountain	2.7	0.4	6.9	6.8	39.1	2.6	9.8	21.2	10.6
Pacific	3.3	0.3	19.0	3.8	51.5	4.0	7.1	4.2	6.8
United States	3.3	1.0	9.3	5.5	26.9	25.1	6.3	15.1	7.5

[1] Computed from *U. S. Census of Manufactures, 1929,* I, 58.

48-hour week has persisted longer than in any other major industry, full time hours have been generally fewer in union than in non-union industries and, within the same industry, in union than in non-union plants. In all the forty years 1890-1929 hours in the building trades have been consistently lower than in manufacturing or coal mining. In part certainly, this difference reflects the relatively greater extent of union organization in the building construction industry. Among the major manufacturing industries the shortest average work weeks in 1929 were 45.9 hours in men's clothing and 45.2 in women's clothing, both highly organized industries (see Table 4). Within such industries, the range in the length of the work week is in the main attributable to differences in hours between organized and unorganized plants. Thus in 1929, when union agreements in the men's clothing industry fixed the full time week at 44 hours, 61 per cent of the employees were reported as working between 40 and 45 hours, but at the same time 16.5 per cent were reported as working from 45 to 48 hours and 12.5 per cent more than 48 (see Table 6). Presumably the majority working the longer weeks were employed in non-union factories—a phenomenon common to most industries that are part union and part non-union.

This fact is illustrated by the practice in bituminous coal mining. Table 12 shows the standard (full time) hours per day in union and in non-union coal fields, 1912-22. At the beginning of the period, the work day was more than one and one-half hours longer in the non-union fields. The margin narrowed with rising prosperity during the War and the progressive unionization of the industry. By 1922 the difference between the two was slight. After this, the difference probably increased once more as the union grew weaker and lost control over much of the industry in the 1920's, but the record for those years is not now available.

In large measure regional differences in hours and differ-

Table 11

Selected Manufacturing Industries
Highest and Lowest Average Full Time Hours per Week, by States or Cities, 1928 and 1932[1]

	1928		*1932*	
Industry	Average Full Time Hours per Week	State or City	Average Full Time Hours per Week	State or City
Machine shops[2]	54.1	Iowa, Kansas, Louisiana	51.8	Georgia
	45.9	California	44.3	California
Foundries[2]	56.4	Louisiana	55.2[5]	Kansas
	45.9	California	39.1	Oregon
Boots and shoes	53.1	Maine	53.0	Maine
	47.1	New Jersey	46.2	New Jersey
Cotton goods	56.1	Georgia	56.0	Georgia
	48.5	New York	48.1	New York
Woolen and worsted goods[3]	52.4	Pennsylvania	55.7	Southern district[6]
	48.0	Vermont	48.0	Rhode Island
Hosiery	55.6	North Carolina	55.4	Georgia
	48.1	New Jersey	47.7	New Jersey
Men's clothing	50.1	Eastern Pennsylvania	51.7	Eastern Pennsylvania
	40.4	Cincinnati	44.0	Chicago, Cincinnati Philadelphia, Rochester
Furniture[4]	57.0	Kentucky	55.0	Georgia, Virginia
	46.9	California	47.2	California
Lumber, sawmills	61.3	Florida	60.3	Alabama
	48.1	Washington	48.0	Oregon, Washington
Slaughtering and meat packing[4]	58.6	Michigan	57.0	Michigan
	47.9	California	46.2	Oklahoma

[1] Compiled from special studies of wages and hours of the U. S. Bureau of Labor Statistics.

[2] Figures are for 1929 and 1933; no figures reported for 1928 and 1932.

[3] Only Northern mills covered in 1928.

[4] Figures are for 1929 and 1931; no figures reported for 1928 and 1932.

[5] High average is due to change by one establishment from 44 hours per week in 1927 to 54 in 1929, affecting a considerable number of wage earners.

[6] Includes Georgia, Kentucky, South Carolina, Tennessee, and Virginia.

Table 12

Union and Non-Union Bituminous Coal Fields

The Basic Working Day, 1912-1922[1]

	Average Standard Hours of Work per Day										
	1912	*1913*	*1914*	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*	*1921*	*1922*
Union fields[2]	8.04	8.05	8.06	8.06	8.06	8.02	8.02	8.01	8.00	8.00	8.00
Non-union fields[3]	9.61	9.50	9.55	9.51	9.54	8.78	8.27	8.11	8.08	8.09	8.15

[1] W. E. Fisher and Anne Bezanson, *Wage Rates and Working Time in the Bituminous Coal Industry, 1912-1922* (University of Pennsylvania Press, 1932), p. 150.

[2] The Central Competitive Field, consisting of Illinois, Indiana, Ohio, and the Pittsburgh region of Pennsylvania; the Southwestern Interstate Field, composed of Arkansas, Kansas, Missouri, and most of Oklahoma; and several widely scattered independent districts. The scattered group included Central Pennsylvania, Michigan, and most of Western Kentucky; the union sections of West Virginia, which consisted of Coal River, Putnam County, and part of Kanawha; and certain fields west of the Mississippi River, namely, Iowa, Wyoming, Montana, and half of the production of Washington.

[3] In Pennsylvania the non-union areas consisted primarily of Connellsville, Somerset, Meyersdale, Indian Valley, Latrobe, Ligonier, Greensburg, and the Irwin Gas District, fields for the most part in Westmoreland, Somerset, Fayette, and Greene Counties. In West Virginia they included the Cumberland-Piedmont, Logan, Kenova-Thacker, Tug River, Pocahontas, and Winding Gulf fields. The non-union areas east of the Mississippi also embraced Maryland, Virginia, the Hazard and Harlan fields of eastern Kentucky, and Alabama. In the West, only two states, New Mexico and Utah, came under this designation.

ences between union and non-union hours are two aspects of the same picture, since union and non-union plants or operations are often, though not always, located in different places. In the building industry, the concentration of unionism in the large cities of the East, Middle West, and Pacific Coast means that working standards, whether of wages or hours, are higher in those regions than in other parts of the country. Table 13 shows the distribution of wage earners in the construction industry by region and by full time hours of work, 1929. Of those employed in the Middle Atlantic States, 64 per cent worked 44 hours and less per week. The 36 per cent employed at longer hours probably worked on the outskirts of the large cities and in towns and villages where there was not much organized labor. On the Pacific Coast, likewise, more than half were on a short week. In the South Atlantic and East South

Table 13

The Construction Industry

Distribution of Wage Earners by Geographical Divisions and Full Time Hours of Work per Week, June 1929[1]

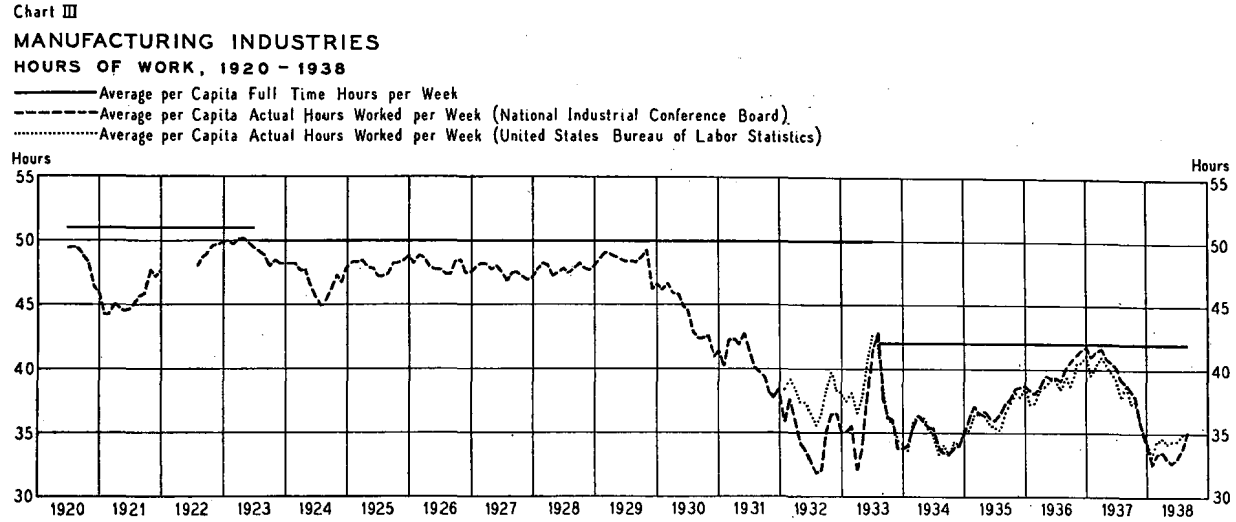
	Percentage of Wage Earners with Full Time Work Week Specified								
Length of Full Time Work Week	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
40 hours, 5 days	10.9	37.8	10.9	9.6	9.9	5.3	3.6	7.8	14.5
44 hours, 5½ days	47.1	27.0	48.5	21.0	25.9	25.8	38.4	37.6	41.2
45 hours, 5 days	0.0	0.1	0.2	0.0	0.2	0.1	0.9	0.0	0.0
48 hours, 6 days	16.4	11.8	10.8	16.4	6.6	3.3	22.1	40.6	42.2
49½ hours, 5½ days	0.2	0.7	2.1	0.4	3.2	2.9	0.6	0.0	0.0
50 hours, 5 days	0.2	0.2	0.1	0.0	0.2	0.6	0.1	0.0	0.0
54 hours, 6 days	15.4	7.6	11.9	9.4	4.7	4.2	8.3	10.4	1.5
55 hours, 5½ days	0.0	1.8	1.7	0.9	22.2	8.6	1.2	0.0	0.0
60 hours, 6 days	9.8	13.0	13.8	42.3	27.2	49.1	24.9	3.6	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Computed from data in the Fifteenth Census of the U. S., 1930: *Construction Industry*. Represents wage earners employed by operative builders, contractors, and sub-contractors in all kinds of construction work, including the erection of buildings, engineering, public works, and utilities construction. Covers only those workers for whom data on hours of work were reported.

Chart III

MANUFACTURING INDUSTRIES

HOURS OF WORK, 1920 - 1938



Central States, half of the employees had full time weeks of 55 hours or more, and in the West South Central States one-fourth were on a 60-hour week.

This table is a composite picture of the distribution of hours in several divisions of construction, of which building is only one. In building construction alone the percentage of union and non-union employees working indicated full time hours in 1936 was as follows:[7]

Full Time Hours per Week	Union	Non-Union
40 hours and under	96.3%	50.7%
41 to 48 hours	3.6	41.4
Over 48 hours	0.1	7.9

IV Full Time and Actual Hours

Considerable interest should attach, for two reasons at least, to comparisons between full time and actual hours. For one thing, there is the important statistical problem of whether changes in full time hours are, in the long run, an accurate measure of the movement of actual hours. It is to be expected, of course, that as full time hours are materially reduced, this reduction should reflect itself in the number of hours actually worked. In a general way this is so. When the average full time work week in manufacturing declined from approximately 50 hours in 1932 to approximately 42 in 1933 and thereafter, average actual hours per week concurrently declined to a lower level. But during the nineteen years, 1920-38, for which statistics of both full time and actual hours are available, changes in business conditions were so frequent and, for a considerable part of the period, so substantial, that actual hours deviated widely from the full time and, in consequence, the movement of full time hours could hardly serve as a safe index of the movement of actual hours.

Chart III gives the monthly figures for average per capita actual hours worked per week in manufacturing,

[7] U. S. Bureau of Labor Statistics, *Monthly Labor Review*, October 1937, p. 798.

Table 14

Twenty-five Manufacturing Industries

Hours Lost as Percentages of Full Time Hours of Work per Week, monthly, 1920-1938[1]

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Jan.		13.3		2.0	3.6	3.0	3.2	3.8	4.0	2.8	7.6	19.6	28.2	29.8	19.0	13.6	8.6	2.4	22.6
Feb.		13.3		2.5	3.6	3.0	2.0	3.2	3.2	1.8	6.6	15.4	24.6	28.8	15.2	11.4	9.3	1.2	20.5
Mar.		11.8		1.8	4.8	2.8	2.4	3.4	3.6	2.0	8.2	15.4	27.8	35.8	13.3	13.1	7.9	0.7	20.2
Apr.		12.4		1.6	4.6	3.8	3.8	4.2	5.2	2.4	8.4	16.2	31.6	32.0	14.5	12.6	6.0	2.6	21.4
May		12.7		2.2	6.8	4.0	4.2	3.6	4.6	2.8	10.2	14.4	32.6	24.8	15.5	13.6	6.2	3.3	22.2
June	3.1	12.5		2.9	8.6	5.2	4.2	4.6	4.0	3.2	11.0	17.4	34.4	17.0	15.7	14.3	6.2	4.3	21.2
July	2.9	11.4	5.9	1.6	10.0	5.2	5.0	6.0	4.8	3.2	14.2	19.8	36.2	14.2	19.0	13.1	6.9	6.7	19.5
Aug.	3.3	10.2	4.5	2.4	9.0	4.8	5.0	4.8	4.2	3.4	15.2	20.6	35.8	9.0	20.2	11.0	4.5	7.4	16.4
Sept.	4.5	9.8	3.9	4.0	7.2	3.2	3.0	4.6	3.4	2.4	15.2	21.2	29.6	13.6	20.5	10.2	3.1	8.8	
Oct.	5.3	6.5	2.7	3.0	5.0	3.2	2.6	5.2	4.2	1.4	14.8	23.8	27.0	14.0	19.3	8.3	2.1	10.0	
Nov.	9.0	7.6	2.5	3.6	6.2	2.8	4.8	5.8	4.6	7.6	18.0	24.4	27.0	19.5	19.0	8.1	1.2	15.2	
Dec.	10.2	6.7	2.2	3.6	4.0	2.0	4.6	5.4	4.0	6.8	17.2	23.2	29.8	19.5	16.7	7.9	0.5	18.8	
Average	5.5	10.6	3.5	2.6	6.2	3.6	3.8	4.6	4.2	3.4	12.2	19.2	30.4	22.1	17.4	11.4	5.2	6.7	20.5

[1] Hours lost are the amount by which actual fall short of full time per capita hours of work. The series of actual hours is that of the National Industrial Conference Board. Full time hours are estimated at 51, June 1920-June 1923; at 50, July 1923-July 1933; and at 42 thereafter.

Table 15

Bituminous Coal Mining

Average Full Time and Actual per Capita Hours of Work per Week and Hours Lost as Percentages of Full Time Hours of Work per Week, 1932-1938

	1932 Average	*1933 Jan.-Sept.*	*1933 Oct.-Dec.*	*1933 Average*	*1934 Jan.-Mar.*	*1934 Apr.-Dec.*	*1934 Average*	*1935 Average*	*1936 Average*	*1937 Average*	*1938 Jan.-July*
Average full time hours per week[1]	48.6	48.6	40.0	46.5	40.0	35.2	36.4	35.1	35.1	35.0	35.0[2]
Average actual per capita hours per week[3]	27.1	29.2	29.8	29.4	32.0	25.5	27.1	26.3	28.8	27.8	21.4
Hours lost as percentages of full time hours per week[4]	44.2	39.9	25.5	36.8	20.0	27.6	25.5	25.1	17.9	20.6	38.9

[1] See Table 3.

[2] Estimated by National Bureau of Economic Research on the basis of the Appalachian Agreement which became effective on April 2, 1937 and provided for the continuation of the 7-hour day, 5-day week.

[3] U. S. Bureau of Labor Statistics, *Monthly Labor Review,* monthly.

[4] Hours lost are the amount by which actual fall short of full time per capita hours of work.

1920-38, and the average per capita full time hours in effect over the same period. It is clear from this chart that, except perhaps for several years during the 1920's, measuring changes in average per capita actual hours worked by changes in average per capita full time hours would lead to quite misleading conclusions.

A second aspect of the relation of full time and actual hours has to do with the expectations commonly associated with reductions in the length of the full time week. Much of the advocacy of the shorter week is due to the belief that fewer per capita hours cause increased employment. Testing this belief involves studies of the movement of employment and full time hours which are not the subject of this *Bulletin.* A closely related hypothesis, at least implicit in the theories of the short week, is that a drastically shorter week may produce more regular employment for those who are employed by narrowing the difference between the actual and full time hours per week. It is possible to subject this hypothesis to some statistical test by comparing per capita actual with full time hours and by computing the time lost. Time lost may be defined as the amount by which actual fall short of full time hours, expressed as a percentage of the full time week. In making these computations it has been assumed that the average full time week in manufacturing was 51 hours from 1920 to 1923, when average full time hours were reduced in the iron and steel industry; 50 hours, 1923-33; and 42 thereafter.

Table 14 shows the percentage of time lost in manufacturing, monthly, 1920-38. From these data there seems to be little evidence, for the period 1920-38, that the percentage of time lost has been much affected by reductions in full time hours. Comparing similar periods of business activity, percentages of time lost appear remarkably steady. During the latest depression, 1937-38, although the average full time week was at least 8 hours less than in 1932-33, the percentages of time lost rose to levels not much different from those of 1932-33, if the greater severity of the earlier depression is taken into account. Much the same thing happened in the bituminous coal industry. In this industry, whose full time hours per week were 48 in 1932 and 35 in 1938, the percentage of time lost in 1932 was 44.2, and during the first seven months of 1938 was 38.9. Table 15

Table 16

Specified Occupations, Selected Foreign Cities

Full Time Hours of Work per Week, October 1937[1]

Occupation	Melbourne Australia	Montreal Canada	Bordeaux France	London England	Stockholm Sweden
Iron molders	44	44-50	40	47	48
Bricklayers and masons	44	40-44	40	44	48
Machine compositors (book and job)	44	44-48	40	48	48
Bakers	44	48-60	40	48	48
Unskilled labor (employed by local authorities)	44	48	40	47	48

[1] International Labour Office, *International Labour Review,* Vol. XXXVII, No. 3, March 1938, p. 382.

shows the average per capita full time and actual hours per week and the percentages of time lost in the bituminous coal industry, 1932-38.

V Full Time Hours in Foreign Countries

International comparisons of the length of the working week must rest on fragmentary data. Such as they are they seem to indicate that in 1937 the shortest week prevailed in France and still does in the United States. In this country most employees in manufacturing, coal mining, and building, work 40 hours or less. In 1937 in France the 40-hour week was well-nigh universal and applied to all classes of labor. In most other countries the 48-hour week was still the most common although shorter hours were to be found in the building industry. Australian labor, except groups of transport workers, seemed to be on a 44-hour week. No figures on full time hours of work are available for Germany. In Japan the full time week is probably close to 60 hours, since available sources of information report the hours per day in 1937 and 1938 as close to 10.[8]

Table 16 gives the full time hours per week in specified occupations in selected foreign cities, October 1937. These figures are generally described by the International Labour Office as the normal statutory hours of work or the normal hours of work as fixed by collective agreements. In most instances, then, they pertain to the most highly unionized occupations, which may be expected to work on shorter schedules of hours than other classes of labor.

[8] International Labour Office, *International Labour Review*, Vol. XXXVIII, No. 1, July 1938, p. 122.

More comprehensive data are available for Great Britain. Table 17 shows for October 1935 the normal week in manufacturing, mining and quarrying (other than coal), transport (other than railways), and certain miscellaneous occupations.

The predominant work week in Great Britain in 1935 was about 48 hours. Approximately 72 per cent of the employees had full time hours between 47 and 48 a week. Nine per cent worked longer than 48 hours and nearly 20 per cent were on schedules of less than 47 hours a week. The shortest weeks prevailed in mining and quarrying (other than coal mining), where 29 per cent of the employees worked 44 hours or less a week, and in building, where 36 per cent worked 44 hours or less. In the important manufacturing industries of metals, machinery, shipbuilding, textiles, and paper and printing, the 48-hour week was the most common working period.

VI Summary

Full time hours, most conveniently defined as the number of hours per week beyond which a shop is normally not expected to work, have steadily declined in this country over the last century. Since 1890 they have been reduced roughly 18 hours in manufacturing, 16 in building, 12 in rail transportation, and 25 in both anthracite and bituminous coal mining. In the last half century the greatest reduction took place during the years of the World War and of the N.R.A. During the War, railroad employees went from the 60- to the 48-hour week as their hours per day were reduced from 10 to 8 either by legislation or by orders of

Table 17

Great Britain, Specified Industrial Groups

Distribution of Wage Earners by Average Normal Hours of Work per Week, October 1935[1]

Industry Group	Percentage of wage earners whose normal weekly hours of work were: 44 or less	over 44 under 47	47 to 48	over 48	Average normal hours per week[2]
Mining and quarrying (other than coal mining)	29.1	16.0	39.3	15.6	46.4
Treatment of non-metalliferous mine and quarry products	11.2	10.2	47.2	31.4	48.6
Brick, pottery, glass, chemical, etc.	14.3	7.7	65.4	12.6	47.2
Metal, engineering, shipbuilding, etc.	6.9	5.7	83.0	4.4	46.8
Textile	4.0	4.2	85.2	6.6	47.8
Leather	3.4	3.5	83.1	10.0	47.8
Clothing	13.8	16.4	66.3	3.5	47.0
Food, drink, and tobacco	12.4	8.6	65.5	13.5	47.7
Woodworking	18.7	15.1	51.4	14.8	46.9
Paper, printing, stationery, etc.	9.9	7.5	78.7	3.9	47.3
Building, contracting, etc.	35.9	29.8	9.5	24.8	46.8
Other manufacturing industries	9.7	12.4	67.3	10.6	47.2
Transport and storage (other than railways)	7.4	2.5	79.3	10.8	47.9
Public utility services	8.2	4.8	72.9	14.1	47.3
Government industrial establishments	3.0	0.2	96.8	0.0	47.3
All above industries	10.6	8.7	71.7	9.0	47.2

[1] *Ministry of Labour Gazette*, July 1937, p. 258.

[2] Excluding mealtimes, except in the case of those shift-workers for whom no definite interval for meals was recognized.

the United States Railroad Administration; anthracite coal miners from the 54- to the 48-hour week; bituminous coal miners from 51.6 to 48.0 hours; factory employees from 55.1 to 50.8; and employees in the building construction industry from 44.9 to 43.9.

A vastly greater decline in all industries except railroads began with the creation of the N.R.A. in June 1933 and has continued as a result of the unusual expansion of trade unionism and the adoption of laws regulating hours of labor. Under the influence of these factors, the work week in coal mining declined from 48 to 35 hours; in manufacturing from more than 50 to close to 40. In building the change in average full time hours was slight largely because the 40-hour week had become quite common even before the N.R.A., and on the railroads the 48-hour week remained unchanged.

During the prosperity of the 1920's average full time hours in manufacturing, coal mining, and on the railroads ceased to decline; there is, indeed, some evidence that they increased slightly in coal mining and manufacturing. This was in the main due to the lengthening of hours in some industries, like cotton textiles, in which substantial parts of the industry had adopted the 48- or 44-hour week during the War and had then abandoned the shorter week during the 1921 depression. At the same time other industries, such as iron and steel, canning and preserving, sugar refining, and lumber, which had retained unusually long full time hours during the War, reduced them materially from 1922 to 1929. The net result of these conflicting movements was to leave average full time hours relatively unchanged but to reduce the spread between the longest and shortest full time week. Thus in 1920 there was a range of 18 hours between 45.3 hours in the clothing industry and 63.1 in iron and steel. But by 1929 the spread had declined to 10 hours, from 45 hours in women's clothing to 55 in cotton goods and sugar refining.

During the depression 1929-32, likewise, although there were many forces, such as work-sharing and union agitation for the shorter week, making for reduced hours, the average full time week apparently was not changed and, when the N.R.A. was established, was roughly 50 hours in manufacturing and 48 in coal mining.

Throughout most of the period 1890-1937 there were large regional differences in full time hours within nearly all industries. On the whole, the longest week in manufacturing has persisted in the southern states and since 1919 the shortest week has prevailed in the Pacific States. Following the passage of the National Industrial Recovery Act in June 1933 and the setting up of the N.R.A., regional differences in full time hours have tended to decline and in some industries to disappear. The enforcement of the federal Fair Labor Standards Act,[9] approved June 25, 1938, may be expected to strengthen this tendency and, in time to establish a more uniform work week for most of American industry.

Union hours have been uniformily fewer than non-union and, in the past, a shorter work week has often been introduced into an industry through the terms of a contract between employers and the union of their employees. The strongly unionized building trades had a shorter week than any other industry until the N.R.A. began the general reduction of working hours. In coal mining, similarly, the 10- and 9-hour day, and hence the 60- and 54-hour week was to be found almost exclusively in the non-union coal fields; and in manufacturing the shortest week in the 1920's prevailed in men's and women's clothing, both highly organized industries. These divergencies between union and non-union hours are reflected in regional differences since it has been customary in this country for employers to seek relaxation of standards of labor and cost by moving from organized to unorganized regions.

When we consider the countries for which data are most comparable, the shortest week appears to be most common in the United States and France, where 40 hours has come to prevail. This is true at present in the United States and was true of France in October 1937, the latest month for which data are available. In Great Britain average full time hours in a wide and representative range of industries were 47.2 in October 1935. Australian labor was largely on a 44-hour week in 1937, while the industries of Sweden and Canada were in the main on a 48-hour week. The International Labour Office does not report, in this survey of October 1937, full time hours for Germany and Russia.

In this country it is possible to compare the movement of average full time with average actual hours per week in manufacturing since 1920 and in bituminous coal mining since 1932. The figures show that the movement of full time hours is an inadequate and often misleading index of the movement of actual hours. They show also that a material reduction in the length of the full time week does not necessarily stabilize employment. In bituminous coal mining the average actual per capita hours per week worked by miners during the first seven months of 1938 were 21.4. Since 35 hours were the full time week, the miners lost in this period 38.9 per cent of their potential full time hours. This compares with 44.2 per cent lost in 1932, when the full time week was 48.6 hours and business conditions were much worse. In manufacturing the percentage of time lost in the first eight months of 1938 was 20.5, as compared to 30.4 in the calendar year 1932.

[9] The Fair Labor Standards Act of 1938, effective October 24, 1938, establishes the following maximum weekly hours for employees engaged in commerce or in the production of goods for commerce: 44 hours during the first year from the effective date of the Act, 42 hours during the second year, and 40 hours thereafter.

National Bureau of Economic Research

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Bulletin 74 1819 BROADWAY, NEW YORK *June 25, 1939*

LIBRARY

25

COMMODITY FLOW AND CAPITAL FORMATION IN THE RECENT RECOVERY AND DECLINE, 1932-1938*

SIMON KUZNETS

ANNUAL ESTIMATES of commodity flow and capital formation for 1919-35 were summarized in *National Income and Capital Formation*. Their derivation and the underlying data were described in detail in *Commodity Flow and Capital Formation*, Volume One. This *Bulletin* brings the preliminary measures through 1938 and analyzes briefly the shares that changes in the flow of various commodity groups and in the components of capital formation contributed to the rise in the economy's total product during the recent expansion of 1932 to 1937 and to the decline from 1937 to 1938.

1. SCOPE AND MEANING OF THE ESTIMATES

Table 1 presents preliminary estimates of commodity flow and capital formation for the seven years, 1932-38. For 1932-33 they are identical with those already published, except for a minor reclassification noted below and a minor revision of the measures for public construction. The published estimates for 1934 and 1935 have been revised by taking into account data that have become available since the publication by the National Bureau in 1937 and 1938 of the two volumes mentioned above; but the revisions have, on the whole, been minor. The estimates for 1936-38 are based on data similar to those from which the preliminary estimates for 1934 and 1935 were originally derived. The data and methods used in preparing the estimates for the recent years are described in detail in the Appendix to this *Bulletin*.

We indicate briefly the meaning of the various categories and totals. The estimates of the flow of perishable, semidurable, and consumers' durable commodities to households and individual consumers (lines 1, 2, and 3 of Table 1) are approximations of their cost to ultimate consumers in the United States. The totals in line 5 are similarly approximations of the cost of producers' durable commodities, except that the ultimate recipients are not households or individual consumers but economic enterprises. The distinction among perishable, semidurable, and durable commodities is based on the duration of life in ultimate use: less than six months for perishable, from six months to three years for semidurable, and over three years for durable. The distinction between producers' and consumers' durable is based on the characteristics of the chief user, no attempt being made to segregate the fraction of a preponderantly consumers' commodity that is sold to business enterprises or of a preponderantly business good that is sold to households or individual consumers.

The three estimates of construction (lines 4, 6, and 8) relate to new construction alone, but include such major repairs and alterations in private construction as require building permits. The basis of valuation is cost of construction, exclusive of such additions as may be involved in the sale of the structure to the ultimate user. Residential construction includes both urban and farm dwellings. Business construction comprises industrial, commercial, recreational and social structures, and farm construction other than dwellings, as well as public utility construction. Public construction comprises highways, streets, bridges, etc., as well as governmental buildings for educational, administrative, or other purposes.

Net flow to inventories is an approximation of the value of commodities added to or subtracted from total business inventories. It is essentially a measure of *commodity flow*, not of *change in values*, and is derived from a comparison of inventories that have been adjusted for changes in value and thus represent commodity totals at comparable price levels; only after such adjustment are the net differences converted back to current price levels. Net addition to claims against foreign countries is self-explanatory: the addition to the capital in the country resulting from the international flow of commodities and services.

The present estimates of the net flow to inventories and net addition to claims against foreign countries differ somewhat in scope from those in the two books mentioned above. This difference results from a decision not to segregate an item formerly treated separately, the net change in stocks of monetary metals. The decision, made largely in order to simplify analysis, meant that the item had to be distributed among other categories. Such changes in the gold stock of the country as resulted from the inflow and outflow of gold (the preponderant share of the total change in monetary metals) have been transferred to the net addition to claims against foreign countries; and thus offset any changes in these claims that arise from the international movement of gold. Consequently, the entries in line 9 reflect the effect

* The estimates presented in this *Bulletin*, as well as the Appendix describing sources and methods used, have been prepared under the immediate direction of William H. Shaw, with the assistance of David L. Rolbein. The author is indebted to Mr. Shaw for valuable aid throughout the preparation of this *Bulletin*; and to Milton Friedman and Moses Abramovitz for helpful suggestions in revising the original draft.

TABLE 1

Commodity Flow and Capital Formation, 1932-1938

(millions of dollars)

TOTALS AND COMPONENTS	CURRENT PRICES							1929 PRICES						
	1932 [1]	1933 [2]	1934 [3]	1935 [4]	1936 [5]	1937 [6]	1938 [7]	1932 [8]	1933 [9]	1934 [10]	1935 [11]	1936 [12]	1937 [13]	1938 [14]
Gross Commodity Product														
1 Flow of perishable commodities	18,147	18,133	20,756	23,095	25,363	26,706	25,502	26,342	27,325	26,920	26,215	28,691	29,060	31,522
2 Flow of semidurable commodities	6,722	6,513	7,512	8,151	9,200	9,720	8,992	9,742	8,872	9,206	10,176	11,344	11,109	11,310
3 Flow of consumers' durable commodities	3,806	3,882	4,686	5,918	7,342	7,664	5,410	4,704	4,645	5,283	6,882	8,547	8,250	5,647
4 Residential construction	444	392	458	923	1,580	1,956	1,746	600	548	595	1,193	1,965	2,193	1,949
5 Flow of producers' durable commodities	2,019	2,051	3,138	3,957	5,429	6,828	5,164	2,601	2,779	3,811	4,583	6,080	6,987	5,243
6 Business construction	1,097	936	1,180	1,463	1,854	2,555	1,952	1,332	1,166	1,404	1,742	2,104	2,726	2,123
7 Net flow to inventories	−2,419	−1,138	−1,699	+1,170	+1,994	+3,337	−314	−3,222	−1,795	−2,243	+1,204	+2,219	+3,368	−366
8 Public construction	1,869	1,383	2,100	1,995	3,265	2,889	3,455	2,334	1,616	2,273	2,195	3,339	2,957	3,760
9 Net addition to claims against foreign countries	+51	+125	+349	−153	−305	−68	+741	+75	+181	+444	−182	−360	−75	+898
10 Gross commodity product (1 through 9)	31,736	32,277	38,480	46,519	55,722	61,587	52,648	44,508	45,337	47,693	54,008	63,929	66,575	62,086
11 Flow of consumers' commodities (1+2+3)	28,675	28,528	32,954	37,164	41,905	44,090	39,904	40,788	40,842	41,409	43,273	48,582	48,419	48,479
12 Gross capital formation (4 through 9)	3,061	3,749	5,526	9,355	13,817	17,497	12,744	3,720	4,495	6,284	10,735	15,347	18,156	13,607
13 Capital formation for business use (5+6+7)	697	1,849	2,619	6,590	9,277	12,720	6,802	711	2,150	2,972	7,529	10,403	13,081	7,000
14 Capital formation for business use, excl. intories (5+6)	3,116	2,987	4,318	5,420	7,283	9,383	7,116	3,933	3,945	5,215	6,325	8,184	9,713	7,366
15 Private durable capital formation (4+5+6)	3,560	3,379	4,776	6,343	8,863	11,339	8,862	4,533	4,493	5,810	7,518	10,149	11,906	9,315
16 Nondurable commodities (1+2)	24,869	24,646	28,268	31,246	34,563	36,426	34,494	36,084	36,197	36,126	36,391	40,035	40,169	42,832
17 Durable commodities and construction (3+4+5+6+8)	9,235	8,644	11,562	14,256	19,470	21,892	17,727	11,571	10,754	13,366	16,595	22,035	23,113	18,722
Net Commodity Product														
18 Net residential construction	−1,382	−1,360	−1,415	−930	−354	−202	—	−1,867	−1,899	−1,838	−1,214	−441	−226	—
19 Net flow of producers' durable and net business construction	−2,084	−1,934	−817	121	1,706	3,148	—	−2,600	−2,370	−928	163	1,915	3,276	—
20 Net public construction	1,321	801	1,452	1,309	2,483	1,967	—	1,638	894	1,518	1,407	2,463	2,006	—
21 Net commodity product (7+9+11+18+19+20)	24,163	25,022	30,824	38,681	47,429	52,272	—	34,812	35,853	38,362	44,651	54,378	56,768	—
22 Net capital formation (7+9+18+19+20)	−4,513	−3,506	−2,130	1,517	5,524	8,182	—	−5,976	−4,989	−3,047	1,378	5,796	8,349	—
23 Net capital formation for business use (7+19)	−4,503	−3,072	−2,516	1,291	3,700	6,485	—	−5,822	−4,165	−3,171	1,367	4,134	6,644	—
24 Net private durable capital formation (18+19)	−3,466	−3,294	−2,232	−809	1,351	2,946	—	−4,467	−4,269	−2,766	−1,051	1,474	3,050	—

of the international flow of commodities and services, but not of gold. The changes in the stock of monetary metals that remained after the exclusion of these gold movements were added to the net flow to inventories.[1]

The nine components just described are presented in Table 1 in both current and 1929 prices; for some, both gross and net values are given; and the components are combined into totals of various descriptions. The adjustments for price changes are described in Volumes 32 and 34 and in the Appendix to this *Bulletin.* The only comment needed here is that the results of this adjustment, the estimates in 1929 prices are, for all items except net flow to inventories, necessarily somewhat cruder approximations than the estimates in current prices. The transition from gross to net values for components of capital formation is made with the help of estimates of capital consumption. These were prepared by Solomon Fabricant and are described in detail in his *Capital Consumption and Adjustment;* for the more recent years they are results of approximations described in the Appendix to this *Bulletin.* The distinction between gross value, i.e., the gross flow of a certain group of finished commodities to their ultimate users, and net value, i.e., the net addition to the stock of such finished commodities in the hands of their ultimate users, needs no further comment. However, annual consumption of producers' durable commodities cannot be estimated separately from that of business construction. Hence these two components, whose gross values can be segregated, have to be treated as one to derive the net value.

The totals into which the components are combined deserve some discussion; especially the pair of totals which, in subsequent analysis, is the most important—gross and net commodity product.

The meaning of these two magnitudes can perhaps be best brought out by comparing them with the more familiar totals of gross national product and net national product or national income. Gross national product is the value of all commodities and services produced during the year, excluding all duplication between raw materials and finished products (or services and commodities that embody them) except that the value of durable capital consumed during the year is not subtracted. Gross national product is thus the value of all *finished* commodities that reach their ultimate users (including producers' durable equipment), plus changes in inventories and in claims against foreign countries, and plus the value of all services not embodied in new commodities. Net national product or national income is the value of all commodities and services produced during the year, without any duplications; or the value of all finished consumers' commodities reaching their ultimate users during the year, plus changes in inventories and in claims against foreign countries, plus changes in the net stock of producers' durable equipment in the hands of enterprises using it, plus the value of all services not embodied in new commodities.

The basic difference between gross *commodity* product and gross *national* product is that the former excludes and the latter includes the value of all services rendered during the year but not embodied in new commodities; this item 'services not embodied in new commodities' is also the difference between the larger total, national income, and the smaller total, net commodity product.[2] The services thus excluded from commodity product are exemplified by direct services of professional practitioners to ultimate consumers (physicians, dentists, teachers, lawyers, etc.); direct services of certain capital goods to ultimate consumers (e.g., of residential real estate to residents); services involved in the repair and maintenance of existing commodities, but not in the construction of new ones. For 1919-35, these services not embodied in new commodities accounted for about 25 per cent of gross national product and for about 28 per cent of net national product or national income. Thus, gross commodity product must have averaged about 75 per cent of gross national product, and net commodity product about 72 per cent of national income.

The most important breakdown of commodity product for our purposes is between consumers' outlay on commodities, which comprises the flow of the three groups of consumers' commodities, and capital formation, which comprises the other components in Table 1. Consumers' outlay on commodities is self-explanatory: it is the total spent in the purchase of perishable, semidurable, or durable commodities; or the value of commodities and services that became embodied in such new perishable, semidurable, and durable commodities as flowed from business enterprises to ultimate consumers during the year. Capital formation, a somewhat less familiar concept, is the value of commodities and services produced during the year that became embodied in additions to inventories, to capital equipment (including construction), and to claims against foreign countries. If the addition to capital equipment is on a gross basis, i.e., the annual consumption of that equipment is not deducted, the resulting total is gross capital formation. If the addition to capital equipment is on a net basis, the resulting total is net capital formation.

If we disregard the net flow to inventories and net addition to claims against foreign countries, two items that cannot easily be broken down by the durability of the goods that enter into them, the rest of gross commodity product can be subdivided between nondurable commodities on the one hand and durable commodities and construction on the other. Such a dichotomy is, however, not useful for net commodity product, since it would mean combining in the durable group items of gross value (consumers' durable) with items of net value.

Most of the components rose continuously from 1932 or

[1]Items needed to make the new categories comparable with those in the earlier publications are provided in the Appendix.

[2]Gross and net commodity product include, however, a small part of services not embodied in new commodities, namely, the part that enters the balance of international payments and hence enters the net addition to claims against foreign countries. But the part thus included is so small as compared with total services not embodied in new commodities that the statement in the text is justified. It is also so small compared with the value of commodities included in gross and net commodity product that the adjective 'commodity' seems justified.

1933 to 1937. In several components and in some of the totals the rise is not evident until after 1933, so that the latter year, rather than 1932, marks the trough of the preceding contraction. In one important item, the flow of perishable commodities, the adjustment for price changes reveals that the rise from 1933 to 1935 was due entirely to a rise in prices; and that quantity volumes did not rise until after 1935. But by and large the impression conveyed by Table 1 is that expansion was fairly general and vigorous through 1937. Only one component declined—the net addition to claims against foreign countries. But it is not unusual for the net result of international transactions in commodities and services to become negative during periods of vigorous expansion in an industrialized country, when imports of commodities and the value of services consumed by tourists tend to rise more than exports of commodities and services.[3]

Since the comprehensive totals of gross and net commodity product rise after 1932, we accept this year as marking the trough of the preceding contraction and the initial year of the expansion that developed later. The preliminary 1938 data indicate a significant decline from 1937 levels. Therefore, we may say that the expansion of activity evident in Table 1 culminated in 1937.

The movement of the series in Table 1 suggests also that the whole period 1932-37 may be treated as a single period of expansion. The chief reason is that the most comprehensive measure of the country's activity available in our estimates—gross and net commodity product—shows a trough in 1932, then a sustained rise to a peak in 1937. True, the flow of perishable commodities, in 1929 prices, suggests a decline from 1933 to 1935; and the study of monthly, rather than annual series, might reveal additional swings within the period, especially immediately before or after the NRA. But the annual estimates in Table 1 fail to reveal a decline that interrupts the rise to 1937 sufficiently to make possible the assumption of more than one expansion during the period.

2. Distribution of the Rise in Commodity Product Among Changes in its Components

In attempting to analyze the rise in commodity product from 1932 to 1937 we so treat the changes in its components as to establish their share in the expansion of gross and net commodity product. Accordingly, we try first to measure the participation of each component or subtotal in the rise in total commodity product. This is readily done by establishing the total rise in commodity product during the expansion, ascertaining the changes in each component or subtotal, and computing their relative share of the total rise in commodity product.

Such percentage distributions are presented in Table 2 (col. 1, 2, and 3 for values in current prices, and 8, 9, and 10 for values in 1929 prices). Since we wish to account for the rise in commodity product during a fixed period, the changes in the components and subtotals are estimated during the same interval. We are concerned here not with the magnitude or timing of the recent expansion as it has been observed in each category of goods distinguished, but with the change in the various components or subtotals during the years for which commodity product showed the sustained rise that marked the period as one of expansion in general economic conditions.

But while the period is thus fixed, we can measure the rise in commodity product and the changes in its components not only from 1932 to 1937, but also as between averages covering more than one year. Thus Table 2 provides a percentage distribution of the rise in commodity product not only from 1932 to 1937, but also between the average value for 1932-33 and for 1936-37; and between the average value for 1932-34 and for 1935-37. The use of such averages reduces any irregular changes that may affect the single year values of 1932 and 1937; damps the effect on the percentage distribution of differences in the timing of the expansion in the various components; and reduces the amplitude of the rise in both total commodity product and its components.[4]

Columns 1-3 and 8-10 show how important was the change in each component or in each subtotal in the rise in gross and net commodity product during the recent expansion. These percentages speak for themselves, but two observations may be made. The first is that the shift in the period for which percentage distributions are computed produces but insignificant differences in them, for values in current prices (col. 1, 2, and 3). The differences are somewhat more pronounced for values in 1929 prices: passing from a comparison of 1932 with 1937 to a comparison of 1932-34 with 1935-37 reduces the relative share of changes in the flow of perishable and of producers' durable commodities, and increases that of changes in the flow of semidurable and consumers' durable commodities, residential and public construction. Second, the adjustment for price changes reduces strikingly the share in the rise in commodity product of changes in the flow of perishable commodities and (to a somewhat smaller extent) in semidurable commodities, and raises correspondingly the percentage share of changes in the other components. This reflects a greater rise during the recent expansion, compared with most pronounced cyclical expansions in the past, in prices of perishable and semidurable commodities than in prices of durable commodities or in construction costs.

Of the $30 billion rise in gross commodity product in current prices from 1932 to 1937, about half was contributed by the rise in gross capital formation and half by the rise in the flow of consumers' commodities; similar percentages for values in constant prices were 65 and 35; net capital formation contributed 45

[3] The decline has perhaps been intensified by the economic policies adopted by the totalitarian states in recent years.

[4] It might have been preferable to compute the percentage distribution not of the algebraic change in commodity product, but of the sum of the rises in the components that did show an expansion during the period. But for the years under analysis, the difference between the algebraic increase in commodity product and the total of all positive changes is minor. Where a simple algebraic total can be used, the use of a total of all positive changes would involve several totals, as the number of components and subtotals and their identity varied.

TABLE 2

Distribution of Changes in Commodity Product among Changes in its Components
Expansion of 1932-1937 compared with Earlier Expansions

TOTALS AND COMPONENTS	CURRENT PRICES							1929 PRICES						
	CHANGE FROM							CHANGE FROM						
	1932 to 1937 [1]	1932-33 av. to 1936-37 av. [2]	1932-34 av. to 1935-37 av. [3]	1921 to 1929 [4]	1921-22 av. to 1928-29 av. [5]	1921-23 av. to 1927-29 av. [6]	Av. change during 4 reference expansions [7]	1932 to 1937 [8]	1932-33 av. to 1936-37 av. [9]	1932-34 av. to 1935-37 av. [10]	1921 to 1929 [11]	1921-22 av. to 1928-29 av. [12]	1921-23 av. to 1927-29 av. [13]	Av. change during 4 reference expansions [14]
Part A Gross Commodity Product														
A Change in gross commodity product (millions of dollars)	29,851	26,648	20,445	22,302	18,973	14,439	8,713	22,067	20,330	15,658	25,548	21,382	16,329	6,249
Percentage distribution of total A among changes in:														
1 Flow of perishable commodities	28.7	29.6	29.6	29.1	32.8	37.3	25.2	12.3	10.0	7.2	25.2	25.2	29.0	20.7
2 Flow of semidurable commodities	10.0	10.7	10.3	12.0	12.7	12.7	13.8	6.2	9.4	10.2	16.5	20.5	17.2	10.6
3 Flow of consumers' durable commodities	12.9	13.7	13.9	19.4	19.3	19.2	16.8	16.1	18.3	19.3	20.8	21.2	22.2	21.0
4 Residential construction	5.1	5.1	5.2	3.4	4.0	3.7	1.4	7.2	7.4	7.7	3.1	2.9	3.1	0.6
5 Flow of producers' durable commodities	16.1	15.4	14.7	13.4	13.1	11.9	10.0	19.9	18.9	18.0	14.1	13.6	13.7	14.7
6 Business construction	4.9	4.5	4.3	10.7	10.5	11.9	7.0	6.3	5.7	5.7	9.2	8.8	10.4	6.8
7 Net flow to inventories	19.3	16.7	19.2	10.3	3.7	—2.7	30.3	29.9	26.1	29.9	9.8	4.4	—1.0	33.5
8 Public construction	3.4	5.4	4.6	5.6	5.5	6.8	2.6	2.8	5.8	4.8	4.8	4.8	6.2	1.4
9 Net addition to claims against foreign countries	—0.4	—1.0	—1.7	—4.0	—1.7	—0.9	—7.2	—0.7	—1.7	—2.8	—3.4	—1.4	—0.8	—9.3
10 Gross commodity product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
11 Flow of consumers' commodities	51.6	54.0	53.8	60.5	64.8	69.2	55.8	34.6	37.8	36.7	62.5	66.9	68.4	52.2
12 Gross capital formation	48.4	46.0	46.2	39.5	35.2	30.8	44.2	65.4	62.2	63.3	37.5	33.1	31.6	47.8
13 Capital formation for business use	40.3	36.5	38.2	34.4	27.4	21.1	47.3	56.1	50.7	53.6	33.1	26.8	23.1	55.0
14 Capital formation for business use excl. inventories	21.0	19.8	19.0	24.1	23.7	23.8	17.0	26.2	24.6	23.7	23.3	22.4	24.1	21.5
15 Private durable capital formation	26.1	24.9	24.2	27.5	27.6	27.5	18.4	33.4	32.0	31.4	26.4	25.4	27.2	22.1
16 Nondurable commodities	38.7	40.3	39.9	41.1	45.5	50.0	39.0	18.5	19.5	17.4	41.7	45.7	46.2	31.3
17 Durable commodities and construction	42.4	44.1	42.7	52.5	52.4	53.5	37.8	52.3	56.1	55.5	52.0	51.3	55.6	44.5
Part B Net Commodity Product														
B Change in net commodity product (millions of dollars)	28,109	25,258	19,457	19,891	16,679	12,628	7,693	21,956	20,240	15,590	23,128	19,258	14,602	5,667
Percentage distribution of total B among changes in:														
18 Net residential construction	4.2	4.3	4.6	0.9	0.9	0.3	—1.8	7.5	7.7	8.0	0.8	0.4	0.2	—1.3
19 Net flow of producers' durable commodities and net business construction	18.6	17.6	16.8	18.8	17.9	18.1	10.0	26.8	25.1	24.1	18.7	18.1	19.5	16.1
20 Net flow to inventories	20.5	17.6	20.1	11.6	4.2	—3.0	34.4	30.0	26.2	30.0	10.8	4.9	—1.1	36.9
21 Net public construction	2.3	4.6	3.7	5.3	5.3	6.7	2.2	1.7	4.8	3.9	4.4	4.0	5.8	1.0
22 Net addition to claims against foreign countries	—0.4	—1.1	—1.8	—4.5	—1.9	—1.0	—8.1	—0.7	—1.7	—2.8	—3.7	—1.6	—0.9	—10.2
23 Net commodity product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
24 Flow of consumers' commodities	54.8	57.0	56.5	67.8	73.7	79.0	63.4	34.8	38.0	36.9	69.1	74.3	76.5	57.6
25 Net capital formation	45.2	43.0	43.5	32.2	26.3	21.0	36.6	65.2	62.0	63.1	30.9	25.7	23.5	42.4
26 Net capital formation for business use	39.1	35.2	36.9	30.4	22.1	15.1	44.4	56.8	51.3	54.1	29.5	23.0	18.4	53.0
27 Net private durable capital formation	22.8	21.9	21.4	19.7	18.7	18.4	8.2	34.2	32.8	32.0	19.5	18.5	19.7	14.8

per cent of the rise in net commodity product in current prices and 65 per cent of the rise in 1929 prices. But perhaps greater interest attaches to a comparison of the percentage distribution for the recent expansion with that for earlier expansions. Are the shares of changes in various components and subtotals in the rise in commodity product during the recent expansion similar to those in earlier cyclical rises, or have any substantial differences developed?

The available estimates go back only to 1919 and it is, at present, impossible to provide measures similar to those in columns 1-3 and 8-10 of Table 2 for a considerable number of cyclical expansions. But even a period as short as that since 1919 affords a background against which the composition of the rise in commodity product during the recent expansion may be judged.

Two types of expansion may be distinguished since 1919. The entire period 1921-29 may be considered a single expansion, since in many measures of economic activity, especially those on an annual basis, the contractions of 1923-24 and 1926-27 appear as mild interruptions in a vigorous climb to a peak in 1929. Or the evidence of monthly data may be examined more closely and the dating of the four reference expansions, established in the business cycle study at the National Bureau under the direction of Wesley C. Mitchell and Arthur F. Burns, accepted. The annual dates of these four reference expansions are: 1919-20, 1921-23, 1924-26, and 1927-29.

We compare the recent rise with both the long expansion from 1921 to 1929 (col. 4-6 and 11-13, Table 2) and the shorter reference expansions (col. 7 and 14). The percentage distributions for the 1921-29 expansion were computed by the same procedure as for the recent expansion: the total rise in commodity product from 1921 to 1929, or from 1921-22 to 1928-29, or from 1921-23 to 1927-29 was taken as 100, and changes in the components or subtotals during the same periods were converted into percentages of the total rise in commodity product. For the four reference expansions we averaged the total rise in commodity product (in dollar values), the changes during the four fixed periods in the components or subtotals; and converted the latter into percentages of the average rise in commodity product.

Annual data are none too accurate a guide in cyclical analysis, and our estimates are rough. Nevertheless broad similarities and differences are useful as suggestions to be checked with the help of more detailed and accurate data. It is as tentative suggestions that the conclusions from the comparisons in Table 2 are submitted.

a] The absolute magnitude of the rise in commodity product during the recent expansion was either equal to or larger than during the 1921-29 expansion or during the average of the reference expansions of 1919-32, with the single exception of the comparison of the change from 1932 to 1937 with the change from 1921 to 1929 in 1929 prices. On conversion to an annual basis, the greater absolute magnitude of the rise during recent years is clear.

ANNUAL RISE IN COMMODITY PRODUCT, VARIOUS EXPANSION PERIODS

(*millions of dollars*)

	1932-34 to 1935-37	1921-23 to 1927-29	1932 to 1937	1921 to 1929	Average, 4 Reference Expansions, 1919-32
Gross Commodity Product					
Current prices	6,815	2,406	5,970	2,788	5,358
1929 prices	5,219	2,722	4,413	3,194	3,082
Net Commodity Product					
Current prices	6,486	2,105	5,622	2,486	4,646
1929 prices	5,197	2,434	4,391	2,891	2,791

b] The share contributed by capital formation, both gross and net, to the rise in commodity product during the recent expansion exceeded the share contributed during either the 1921-29 expansion or, on the average, during the reference expansions; accordingly, the share contributed during the recent expansion by consumers' outlay on commodities was smaller than during preceding expansions within the period covered by our analysis. The greater share of capital formation is observable even for values in current prices; when translated into 1929 prices, it becomes very marked indeed.

c] In view of current discussion concerning the share of business capital formation in recovery, especial interest attaches to the comparisons in lines 13, 14, 15, 19, 26, and 27 of Table 2—the share in the rise in commodity product of three totals: (i) capital formation destined for business use—the sum of producers' durable commodities, business construction, and net flow to inventories; (ii) same total as (i) but excluding net flow to inventories; (iii) total private durable capital formation, comprising residential and business construction and the flow of producers' durable commodities. Of these three totals, the third probably comes closest to describing what is commonly understood as private investment or capital formation by private business.

Capital formation for business use, including net flow to inventories, shows a greater rate of participation in the rise in commodity product during the recent than during the 1921-29 expansion, whether the comparison is for gross or net capital formation, in current or 1929 prices. But as compared with its average share during the reference expansions, its share during the recent expansion is smaller in current prices and about the same in 1929 prices. When net flow to business inventories is excluded, the greater rate of participation during the recent expansion disappears: in current prices the share of capital formation for business use is somewhat lower during the recent expansion, and in 1929 prices it is about equal to or somewhat greater than during the 1921-29 expansion. Finally, when private durable capital formation is considered, its share in the rise in commodity product during the recent expansion is smaller than

during the 1921-29 expansion only for gross values in current prices. In all other comparisons with the 1921-29 expansion, and in all comparisons with the reference expansions, the share during the recent rise is either equal to or significantly higher than in earlier expansions.

Values in 1929 prices, even though cruder approximations, are more significant for the purpose of studying the real rise during recent and earlier expansions. It is, therefore, of great interest that in 1929 prices, the share of any of the three totals of business or private capital formation in the recent rise in commodity product is either equal to or significantly higher than in the earlier expansions.

d] The conclusions under (b) and (c) are further illuminated by a study of individual components. The relative shares of perishable, semidurable, and consumers' durable commodities, each taken singly and all together, were less during the recent expansion than during the long expansion of 1921-29; the shares of residential construction, producers' durable, and net flow to inventories were distinctly greater. The components of capital formation whose shares in the rise in commodity product were lower during the recent than during the 1921-29 expansion were business construction, and, somewhat less clearly, public construction. The difference in the shares of residential construction during the two expansions is due, perhaps much more than for other components, to differences in the timing of the rise.

e] To the rise in commodity product the flow of perishable (except in current prices), semidurable, consumers' durable commodities, and the net flow to inventories contributed smaller percentage shares during the recent expansion than, on the average, during the reference expansions. The components whose changes accounted for a larger share of capital formation in the rise in commodity product during the recent expansion are residential construction, flow of producers' durable commodities, and public construction. However, the relative differences in the share of the net flow to inventories are small for the comparison in 1929 prices, this particular component accounting on the average for almost one-third of the total rise in commodity product, during both the recent expansion and the reference expansions.

Numerous other conclusions could be drawn from Table 2, especially concerning the differences in percentage distribution between the long expansion of 1921-29 and the average of the reference expansions. Immediately noticeable are the strategic importance during the latter of net flow to inventories as compared with its very small share during the 1921-29 rise; the smaller average share of the various construction components and of the flow of perishable commodities during the reference expansions. But these differences cannot be analyzed in this *Bulletin.*

3. Relative Intensity of Participation

The relative share of any component in the rise (or decline) of a total such as commodity product can be traced to two factors: the average size of each component and its susceptibility to a rise (or decline) during the fixed period used. Thus gross capital formation contributes about one-half of the rise in gross commodity product during the 1932-37 expansion. This contribution might be because: gross capital formation had an average value about one-half the average value of gross commodity product and was subject to a cyclical rise of the same relative magnitude as the rise in gross commodity product; gross capital formation accounted for less than one-half of gross commodity product but was subject to a rise of greater relative amplitude than the latter; gross capital formation accounted for more than one-half of gross commodity product, but was subject to a rise of smaller relative amplitude than gross commodity product.

To discover the reason for the size of the contribution, changes in the components must be related to their average rise. But this can be done satisfactorily only if the average value of a component is of appreciable positive magnitude and is derived from items uniform in sign. Consequently, our analysis is confined to gross commodity flow and gross value of construction, and utilizes a total exclusive of net flow to inventories and net additions to claims against foreign countries.

Another difficulty is the selection of the period for which to compute the average value of each component and of gross commodity product (exclusive of the two net change items). Two types of period may be adopted. We may compute the average value of components and of commodity flow over the whole period covered by our estimates, 1919-37, and thus compare the relative shares during the various expansions with the average value over the period as a whole. Or we may compute the average values for the years covered in each expansion, and then compare the percentage distribution of the rise in commodity product during each expansion with the percentage distribution of the average value of commodity product, the averages referring to the successive periods covered by different expansions.

Whatever the period for which average values are computed, the percentage distribution of average values and of the rise in gross commodity product among changes in its components can be most easily compared by dividing the percentage shares in the latter distribution by those in the former. The resulting ratio, which may be designated 'rate of relative intensity of participation', will equal one if the relative share of changes in the component in the rise in commodity product is exactly equal to the relative share of the average value of that component in the average value of commodity product. Such a ratio would indicate that the amplitude of the rise in the given component, relatively to its average value, is exactly equal to the amplitude of the rise in commodity product relatively to the average value of the latter. A rate of relative intensity of participation less than one indicates that the relative amplitude of the rise in the given component is lower than the relative amplitude of the rise in commodity product itself. A rate of relative intensity of participation greater than one indicates that the relative amplitude of the rise in the given component is higher than the relative amplitude of the rise in commodity product itself. The rate of relative inten-

TABLE 3

Relative Intensity of Participation by Components in the Rise in Gross Commodity Product Expansion of 1932-1937 compared with Earlier Expansions

RATE OF RELATIVE INTENSITY OF PARTICIPATION

TOTALS AND COMPONENTS	CURRENT PRICES						1929 PRICES					
	Rise 1932-37 compared with av. value for		Rise 1921-29 compared with av. value for		Av. change during 4 reference expansions compared with av. value for		Rise 1932-37 compared with av. value for		Rise 1921-29 compared with av. value for		Av. change during 4 reference expansions compared with av. value for	
	1919-37 [1]	1932-37 [2]	1919-37 [3]	1921-29 [4]	1919-37 [5]	4 ref. expansions [6]	1919-37 [7]	1932-37 [8]	1919-37 [9]	1921-29 [10]	1919-37 [11]	4 ref. expansions [12]
Gross Commodity Product												
1 Flow of perishable commodities	.79	.71	.70	.75	.74	.77	.38	.34	.58	.62	.59	.62
2 Flow of semidurable commodities	.66	.69	.68	.68	.96	.94	.49	.47	.99	1.03	.79	.82
3 Flow of consumers' durable commodities	1.21	1.26	1.59	1.52	1.67	1.65	1.75	1.91	1.71	1.61	2.13	2.02
4 Residential construction	1.29	2.82	.77	.54	.38	.30	2.17	4.64	.70	.48	.17	.12
5 Flow of producers' durable commodities	2.21	2.26	1.59	1.64	1.44	1.43	3.19	3.39	1.70	1.69	2.20	2.13
6 Business construction	1.13	1.76	2.17	1.85	1.72	1.49	1.68	2.78	1.87	1.57	1.70	1.43
7 Public construction	.98	.82	1.40	1.50	.77	.87	.95	.87	1.21	1.31	.45	.50
8 Gross commodity product[1]	1.20	1.23	1.04	1.04	1.27	1.24	1.38	1.41	1.05	1.04	1.29	1.27
9 Flow of consumers' commodities	.83	.79	.84	.87	.95	.97	.63	.60	.87	.90	.89	.92
10 Gross capital formation excl. net change items	1.55	1.86	1.51	1.37	1.16	1.08	2.23	2.80	1.44	1.28	1.35	1.22
11 Gross capital formation[1]	2.26	2.98	1.60	1.49	2.17	1.92	3.71	5.08	1.61	1.42	2.53	2.16
12 Capital formation for business use[2]	3.07	3.91	2.27	2.21	3.81	3.37	5.21	6.95	2.32	2.13	4.78	4.08
13 Capital formation for business use excl. inventories	1.80	2.11	1.78	1.71	1.53	1.45	2.62	3.19	1.77	1.64	2.01	1.84
14 Private durable capital formation	1.68	2.23	1.54	1.35	1.25	1.12	2.51	3.42	1.49	1.27	1.55	1.34
15 Nondurable commodities	.75	.70	.69	.72	.80	.83	.41	.37	.70	.74	.65	.68
16 Durable commodities and construction	1.43	1.63	1.54	1.42	1.35	1.28	2.05	2.45	1.54	1.40	1.63	1.50

[1] Includes net flow to inventories and net addition to claims against foreign countries. The rate for gross commodity product excluding these items is necessarily 1.00.
[2] Includes net flow to inventories.

sity of participation for total commodity product is, naturally, always equal to one.[5]

Table 3 presents rates of relative intensity of participation for the various gross components, as well as for the wider totals. But in addition to commodity product and capital formation, confined to flow of commodities and construction, it presents measures for totals inclusive of net flow to inventories and net addition to claims against foreign countries. Since these items are of a small relative magnitude, when treated as parts of the wider totals, it is permissible to compute rates of relative intensity of participation for these totals. Finally, in order not to complicate presentation, measures of relative intensity of participation are given in Table 3 for the recent expansion and for the 1921-29 expansion, only for the periods from the single year troughs (1932 and 1921) to the single year peaks (1937 and 1929). The conclusions from measures based on rise between averages of values for more than one year would be similar to those suggested by Table 3.

a] The rate of relative intensity of participation for capital formation is invariably above one, which means that the rate for consumers' outlay on commodities is invariably below one. This contrast is greater for values in 1929 prices than for those in current prices; and for capital formation inclusive of the net flow components than for that exclusive of them. Rates of relative intensity of participation well above one characterize also the various totals of business or private capital formation. Furthermore, there is an equally significant contrast between rates of relative intensity of participation below one for total nondurable commodities and above one for total durable commodities and construction.

b] However, not all components of consumers' outlay on commodities show a rate below one; and not all components of capital formation show a rate above one. The flows of consumers' perishable and, with one exception, semidurable commodities are characterized by rates that indicate that the relative amplitudes of the rises in these components during reference periods of cyclical expansion are well below the relative amplitude of the rise in commodity product. But the flow of consumers' durable commodities shows rates significantly above one. Among the components of capital formation, public and residential construction show rates below one for the average of the reference expansions; the former shows a rate below one even for the expansion of 1932-37, and the latter for the expansion of 1921-29.

[5]Another way of computing rates of relative intensity of participation would be first to ascertain the amplitude of the rise in each component as well as in total commodity product, relatively to the average value of the items in question; and then divide the relative amplitude of the rise in each component by the relative amplitude of the rise in total commodity product. The results should be identical with the results of the division of the percentage share of each component in the rise in commodity product by the percentage share of the average value of each component in the average value of commodity product. The rate of relative intensity of participation thus indicates the ratio by which the relative amplitude of the rise in each component is greater or smaller than the relative amplitude of the rise in commodity product.

c] The rates of relative intensity of participation, computed in terms of the average values for the period as a whole, show the same similarities and differences in behavior between the 1932-37 expansion and the earlier expansions as were shown in Table 2. This is inevitable since these rates are obtained by dividing the percentages in Table 2 for the various expansion periods by one and the same set of percentages, that describing the percentage distribution of average values for 1919-37.

d] Thus only the rates based on the average values for each expansion can yield a comparison between the most recent and earlier expansions significantly different from that in Table 2. Observing these rates in Table 3 for the various components and subtotals of gross capital formation, we find that they show an even greater rate of intensity of participation by capital formation in the rise during the recent expansion than would be expected from Table 2. This is clearly demonstrated by the fact that for all components of capital formation, except public construction, the rates in columns 2 and 8 exceed those in columns 1 and 7; while the rates in columns 4, 6, 10, and 12 are less than those in columns 3, 5, 9, and 11 respectively.

e] As a consequence, rates of intensity of participation computed in terms of average values during the various designated periods of expansion are almost uniformly and significantly higher for gross capital formation or for the various totals of gross business capital formation during the recent than during the 1921-29 expansion or, on the average, during the four reference expansions, 1919-32. Only for business construction in current prices and public construction in both current and 1929 prices are the rates of relative intensity of participation lower during the recent expansion than during earlier expansions, and only in comparison with that from 1921 to 1929.

f] Similarly, the corresponding rates of intensity of participation for total durable commodities and construction are higher during the recent expansion than during the earlier expansions.

4. Extent of Recovery

The preceding analysis suggested that the absolute magnitude of the 1932-37 expansion was, for most comparisons, at least as great as that of preceding expansions during the period covered by our estimates; that total business capital formation, in all three variants, showed, for comparisons in 1929 prices, a share in the recent rise in commodity product equal to or greater than the share during the earlier expansions; and that the rate of intensity of participation by total or business capital formation was equal to or higher during the recent expansion than the rates prevailing in the earlier expansions. These conclusions seem at first to contradict prevalent opinion to the effect that the recovery was not vigorous as compared with previous expansions; that capital formation, especially by business agencies, definitely lagged; and that many economic problems besetting the country are to be traced to this failure of business capital formation to recover vigorously.

The contradiction is, however, only apparent. The analysis in sections 2 and 3 deals with *changes* only; whereas the preva-

lent notions just mentioned refer to *absolute volumes* of economic activity as compared with some desirable levels. Briefly, the difference is between emphasizing *expansion* and emphasizing *recovery*. So far we have emphasized the former; we now consider the levels of activity to which this expansion brought us, judging them in the light of some desirable levels.

For this purpose volumes in 1929 prices alone are fully relevant: a change in the volume of activity when measured in current price levels cannot be easily interpreted as representing a rise or decline in the supply of goods. But even if the comparison is confined to measures in 1929 prices,[6] there is still the question what level should be chosen as a basis for measuring the extent of recovery by the end of the recent expansion.

Since the usual reference is to 1929 levels, one may compare the volume of activity in this last pre-depression year with the volume in 1937, the year that seems to mark the culmination of the recent expansion. But it may be objected that the high levels of 1929 do not necessarily represent volumes of activity that can be considered desirable or normally to be expected; and that while the 1937 levels were likewise at the culmination of the expansion, we cannot assume that elements of transient exaggeration in 1937 were relatively the same as in 1929. If this contention is at all valid, the proper comparison in measuring recovery is not of levels for the single years 1929 and 1937, but between some averages. Those for 1928-29 and 1936-37 may conveniently be taken. Finally, it may be suggested that desirable pre-depression levels of operation are indicated by an average not for the two years 1928-29 but by some broader average for the decade of the 'twenties, one that would cover other years of culminating expansion. This would suggest the average levels for 1922-23, 1925-26, and 1928-29 as those of advanced phases of the shorter expansions during the 'twenties; we may then compare the levels of activity for 1936-37 with the average levels for these six years.

Levels at the culmination of the recent expansion are compared with these three variants of pre-depression levels, for totals in 1929 prices, in the first six columns of Table 4. In the other three columns the comparisons are similar but the general rise in the population of this country is taken into account and recovery is measured on the assumption that per capita pre-depression levels should be restored if recovery is to be complete. Of course, even this assumption disregards the secular rise in per capita production and hence the fact that complete recovery from a cyclical depression assumes not only a restoration of pre-depression per capita levels but also a rise in that per capita consonant with the secular rise in the country's economy.

We now summarize the conclusions suggested by the comparisons:

a] By the end of the recent expansion, total gross or net commodity product was at levels fairly close to those prevailing immediately before the depression, and higher than those for the six expansion years in the 1920's. On a per capita basis, the shortage in commodity product as compared with pre-depression years becomes more appreciable, amounting to about 11 per cent of the levels of 1929 or 1928-29.

b] Compared with pre-depression levels, the value of consumers' outlay on commodities at the culmination of the recent expansion showed a smaller shortage or greater excess than either gross or net capital formation.

c] Total capital formation for business use, including net flow to inventories, also shows but moderate shortages in 1937, or 1936-37, as compared with pre-depression levels; and in the per capita figures alone do the shortages become significant. But when the flow to inventories is excluded, the conclusion is modified. In the total of producers' durable commodities and business construction the recovery fell appreciably short of pre-depression levels even when not reduced to per capita figures. A similar shortage is still more marked for total private durable investment: the gross totals indicate a shortage of 18 to 25 per cent of pre-depression levels; net totals indicate a somewhat smaller absolute shortage but one that amounts to between 37 and 56 per cent of pre-depression net levels.

d] Consideration of the components reveals the difference in recovery among the various areas in economic activity more clearly. One component, net flow to inventories, shows uniformly a much higher level at the end of the recent expansion than the pre-depression level, whether total or per capita. It is this great weight of an increased flow to inventories that serves equally to account for the relatively favorable showing of capital formation and of the first total of capital formation for business use (lines 12 and 22). Gross public construction also shows, in all comparisons but one, excesses rather than shortages.

Two important components show either moderate shortages or moderate excesses over pre-depression levels: the flow of perishable commodities and of producers' durable equipment. The failure of the former to show either a material shortage or excess is not surprising in view of the expected stability of consumers' outlay on the purchase of perishable commodities. But the favorable showing of the flow of producers' durable equipment is unusual, and in conjunction with the significant rise in the flow to inventories, sheds light on the nature of the recent expansion treated as a recovery.

The most striking failure of recovery is in residential and business construction: total gross value at the end of the recent expansion was still from one-third to one-half short of pre-depression levels. And the net value of residential construction was still negative at the culmination of the recent expansion, as compared with positive values in or before 1929. It is these components that tend to bring down the totals of business or private durable capital formation and account for the unfavorable showing of the recent expansion treated as a recovery to pre-depression levels.

The flows of consumers' semidurable and durable commodities also show appreciable shortages, the former only in comparison with the immediate pre-depression years (1929 or 1928-29). These shortages are greater than for perishable or producers'

[6] Even volumes in 1929 prices are but rough measures of the positive result of economic activity, especially in view of the limitations of our estimates.

TABLE 4

Shortage or Excess of Volumes at the Peak of the 1932-1937 Expansion compared with Those at the Peaks of Earlier Expansions, Commodity Product and its Components

SHORTAGE OR EXCESS IN 1929 PRICES, TOTAL, AND PER CAPITA

TOTALS AND COMPONENTS	TOTAL						PER CAPITA IN PERCENTAGES OF EARLIER VOLUME		
	1937 compared with 1929		1936-37 av. compared with 1928-29 av.		1936-37 av. compared with av. of 1922-23, 1925-26, and 1928-29		1937 compared with 1929	1936-37 av. compared with 1928-29 av.	1936-37 av. compared with av. of 1922-23, 1925-26, and 1928-29
	Absolute (millions of dollars) [1]	Percentage of earlier volume [2]	Absolute (millions of dollars) [3]	Percentage of earlier volume [4]	Absolute (millions of dollars) [5]	Percentage of earlier volume [6]	[7]	[8]	[9]
Gross Commodity Product									
1 Flow of perishable commodities	572	2.0	1,054	3.8	3,163	12.3	—4.2	—2.6	1.2
2 Flow of semidurable commodities	—1,026	—8.5	—598	—5.1	756	7.2	—14.0	—10.9	—3.3
3 Flow of consumers' durable commodities	—1,644	—16.6	—1,326	—13.6	—162	—1.9	—21.6	—19.0	—11.3
4 Residential construction	—817	—27.1	—1,560	—42.9	—2,137	—50.7	—31.5	—46.4	—58.1
5 Flow of producers' durable commodities	96	1.4	47	0.7	1,031	18.7	—4.8	—5.6	7.2
6 Business construction	—1,855	—40.5	—2,071	—46.2	—1,499	—38.3	—44.0	—49.3	—44.0
7 Net flow of inventories	929	38.1	1,734	163.6	1,434	105.4	29.8	149.4	84.5
8 Public construction	29	1.0	248	8.6	792	33.6	—5.0	1.7	20.8
9 Gross commodity product[1]	—4,123	—5.8	—3,243	—4.7	2,799	4.5	—11.6	—10.6	—5.8
10 Flow of consumers' commodities	—2,098	—4.2	—870	—1.8	3,757	8.4	—9.9	—7.8	—2.2
11 Gross capital formation[1]	—2,125	—10.5	—2,373	—12.4	—958	—5.4	—15.9	—17.9	—14.7
12 Capital formation for business use	—830	—6.0	—290	—2.4	965	9.0	—11.5	—8.3	—1.5
13 Capital formation for business use excl. inventories	—1,759	—15.3	—2,025	—18.5	—469	—5.0	—20.4	—23.6	—14.2
14 Private durable capital formation	—2,576	—17.8	—3,584	—24.5	—2,605	—19.1	—22.7	—29.3	—27.1
15 Nondurable commodities	—454	—1.1	456	1.2	3,919	10.8	—7.1	—5.1	—0.1
16 Durable commodities and construction	—4,191	—15.3	—4,662	—17.1	—1,975	—8.0	—20.4	—22.3	—17.0
Net Commodity Product									
17 Net residential construction	—756	—142.6	—1,526	—128.0	—2,356	—116.5	—138.6	—126.3	—114.8
18 Net flow of producers' durable and net business construction	—1,062	—24.5	—1,401	—35.1	—406	—13.5	—29.1	—39.3	—21.5
19 Net public construction	—320	—13.8	—72	—3.1	384	20.8	—18.8	—9.4	9.4
20 Net commodity product[1]	—3,814	—6.3	—2,907	—5.0	2,234	4.2	—12.0	—10.9	—6.0
21 Net capital formation[1]	—1,716	—17.0	—2,036	—22.4	—1,523	—17.7	—22.0	—27.2	—25.7
22 Net capital formation for business use	—133	—2.0	333	6.6	1,027	23.5	—7.9	0.0	11.8
23 Net private durable capital formation	—1,818	—37.3	—2,927	—56.4	—2,762	—55.0	—41.1	—59.1	—59.3

[1] Includes net addition to claims against foreign countries.

durable commodities, but much smaller than for residential or business construction.

5. The Contraction of 1929-1932 and the Expansion of 1932-1937

Juxtaposition of the conclusions concerning the recovery by the end of the recent expansion with the conclusions derived from the analysis in sections 3 and 4 raises several questions. Why do components like the flow of perishable and semidurable commodities make such a favorable showing when compared with pre-depression years in Table 4, when their share in the rise in commodity product during the recent expansion was less than during earlier expansions and their rate of intensity of participation was well below one (see Tables 2 and 3, lines 1 and 2, for values in 1929 prices)? A similar question arises concerning consumers' durable commodities, although its share in the recent expansion was not as much below its share during earlier expansions as were those of the other two components of consumers' outlay on commodities. Why, at the culmination of the recent expansion, was there such an appreciable shortage in residential construction, when its share in the rise in commodity product during the recent expansion was well above its share during earlier expansions and its rate of intensity of participation was well above one? An answer to these questions would account also for the fact that total capital formation for business use, excluding inventories, and total private durable capital formation show appreciable shortages in Table 4 despite high shares in the rise in commodity product or high rates of intensity of participation in the recent expansion.

The explanation lies obviously in the behavior of the various components during the severe contraction that preceded 1932. The recovery to pre-depression levels is a combination of the decline from these levels to 1932 or 1933 and of the rise thereafter to the peak of the expansion in 1937. Any discrepancies between the recovery that would be expected on the basis of the rise in components from 1932 to 1937 and actual recovery—in comparison with pre-depression levels—is to be explained by differences in behavior during the contraction from 1929 (or any other pre-depression year used in the analysis) to 1932 or 1932-33.

Therefore, we now measure changes in the components and subtotals during the 1929-32 contraction and compare them with the changes in the subsequent expansion (Table 5). Since the purpose of these measures is largely to explain the differences in the recovery shown in Table 4, the values studied and the periods to which contraction and expansion are assigned conform precisely with the measures in Table 4. The contraction is from 1929 to 1932, or from 1928-29 to 1932-33, or from the average of the six expansion years of the 1920's to the average of 1932-33. The expansion is either from 1932 to 1937 or from 1932-33 to 1936-37. And the absolute changes established for these periods of both expansion and contraction are expressed as percentages of the corresponding pre-depression level. Comparison of these percentages for each component will thus yield directly the relative shortage or excess in its value at the end of the recent expansion as compared with pre-depression levels. The analysis is confined to totals in 1929 prices, without reduction to per capita averages. But the results of such reduction would be similar to those suggested by the analysis of totals.

Table 5, in conjunction with Table 4, reveals the interrelation between the severity of the decline during the 1929-32 contraction and the relative magnitude of the rise during the 1932-37 expansion, and the way in which the decline and the rise combine to yield by 1937 (or 1936-37) differences among components in their recovery to pre-depression levels. The conclusions concerning these interrelations may be summarized briefly.[7]

a] There is positive association not only between the *absolute* magnitude of the decline during the 1929-32 contraction and of the rise during the recent expansion, but also between the decline and the rise when expressed as percentages of pre-depression levels. Thus the greater the *percentage* decline during the contraction preceding 1932-33 the greater the relative rise during the expansion from 1932-33 to 1937. The association would be still more marked were the decline expressed in percentages of pre-depression levels and the rise in percentages of the level at the trough of the contraction.

b] While large relative declines during the contraction tend to be followed by large relative rises during the subsequent expansion, and low relative declines during contraction by low relative rises, the association is not sufficiently close to obliterate the effects of differences in decline during contraction on differences in recovery. For components excluding the net flow to inventories, the differences in decline during the contraction were still the dominant factor in determining differences in the recovery by the end of the 1932-37 expansion.

c] The evidence is inconclusive regarding the significance of differences in relative rise during the recent expansion in determining differences in relative shortage in 1937 or 1936-37 (as compared with pre-depression levels). If, however, we consider only the components referring to flow of commodities to users and construction (excluding net flow to inventories) the coefficients indicate that the differences in relative rise during the 1932-37 expansion did *not* contribute significantly to differences among the several components in the extent of shortage or excess they showed in 1937 or 1936-37. Thus, the relative rise in residential construction was more substantial than the rise in the flow of perishable and of semidurable commodities, and yet its shortage at the end of the expansion was much greater than for these components. The reason lies mainly in the extraordinarily severe decline in residential construction during the contraction that

[7] These conclusions are based largely on coefficients of rank correlation for the components in Tables 4 and 5, omitting the net addition to claims against foreign countries and computing measures for the other components, both inclusive and exclusive of net flow to inventories. Because of the small number of components, the coefficients are rather erratic, and their specific magnitudes are of limited significance. We have, therefore, omitted them from the text. The conclusions stated are based on the preponderant evidence of these coefficients, but are necessarily tentative.

TABLE 5

Absolute and Relative Magnitude of the Decline during the Depression culminating in 1932-1933 and of the Rise during the 1932-1937 Expansion, Commodity Product and its Components, 1929 Prices

TOTALS AND COMPONENTS	Absolute decline 1929-32 (*millions of dollars*) [1]	Absolute rise 1932-37 (*millions of dollars*) [2]	Decline 1929-32 as % of 1929 value [3]	Rise 1932-37 as % of 1929 value [4]	Absolute decline from 1928-29 av. to 1932-33 av. (*millions of dollars*) [5]	Absolute rise from 1932-33 av. to 1936-37 av. (*millions of dollars*) [6]	Decline from 1928-29 av. to 1932-33 av. as % of 1928-29 av. value [7]	Rise from 1932-33 av. to 1936-37 av. as % of 1928-29 av. value [8]	Absolute decline from av. of 1922-23, 1925-26, and 1928-29 to 1932-33 av. (*millions of dollars*) [9]	Absolute rise from 1932-33 av. to 1936-37 av. (*millions of dollars*) [10]	Decline from av. of 1922-23, 1925-26, and 1928-29 to 1932-33 av. as % of av. value for 1922-23, 1925-26, and 1928-29 [11]	Rise from 1932-33 av. to 1936-37 av. as % of av. value for 1922-23, 1925-26, and 1928-29 [12]
Gross Commodity Product												
1 Flow of perishable commodities	2,146	2,718	7.5	9.5	988	2,042	3.6	7.3	1,121	2,042	4.4	7.9
2 Flow of semidurable commodities	2,393	1,367	19.7	11.3	2,517	1,919	21.3	16.2	1,163	1,919	11.1	18.3
3 Flow of consumers' durable commodities	5,190	3,546	52.5	35.8	5,050	3,724	51.9	38.3	3,886	3,724	45.4	43.5
4 Residential construction	2,410	1,593	80.1	52.9	3,065	1,505	84.2	41.4	3,642	1,505	86.4	35.7
5 Flow of producers' durable commodities	4,290	4,386	62.3	63.6	3,797	3,844	58.5	59.3	2,813	3,844	51.1	69.9
6 Business construction	3,249	1,394	70.9	30.4	3,237	1,166	72.2	26.0	2,665	1,166	68.1	29.8
7 Net flow to inventories	5,661	6,590	232.1	270.2	3,568	5,302	336.6	500.2	3,868	5,302	284.4	389.9
8 Public construction	594	623	20.3	21.3	925	1,173	31.9	40.4	381	1,173	16.2	49.8
9 Gross commodity product[1]	26,290	22,067	37.1	31.2	23,574	20,329	34.4	29.7	17,531	20,329	28.1	32.6
10 Flow of consumers' commodities	9,729	7,631	19.3	15.1	8,556	7,685	17.3	15.6	3,928	7,685	8.8	17.2
11 Gross capital formation[1]	16,561	14,436	81.7	71.2	15,018	12,644	78.5	66.1	13,602	12,644	76.8	71.4
12 Capital formation for business use	13,200	12,370	94.9	88.9	10,602	10,312	88.1	85.7	9,346	10,312	86.7	95.7
13 Capital formation for business use excl. inventories	7,539	5,780	65.7	50.4	7,034	5,010	64.1	45.7	5,478	5,010	58.2	53.2
14 Private durable capital formation	9,949	7,373	68.7	50.9	10,099	6,515	69.1	44.6	9,120	6,515	66.7	47.8
15 Nondurable commodities	4,539	4,085	11.2	10.1	3,505	3,962	8.8	10.0	42	3,962	0.1	10.9
16 Durable commodities and construction	15,733	11,542	57.6	42.3	16,074	11,412	59.0	41.9	13,387	11,412	54.5	46.5
Net Commodity Product												
17 Net residential construction	2,397	1,641	452.3	309.6	3,075	1,549	258.0	129.9	3,905	1,549	193.1	76.6
18 Net flow of producers' durable and net business construction	6,938	5,876	159.9	135.5	6,482	5,081	162.2	127.1	5,487	5,081	182.8	169.3
19 Net public construction	688	368	29.6	15.8	1,040	968	45.1	42.0	584	968	31.6	52.3
20 Net commodity product[1]	25,770	21,956	42.5	36.2	23,146	20,240	39.6	34.6	18,005	20,240	33.8	37.9
21 Net capital formation[1]	16,041	14,325	159.4	142.3	14,590	12,554	160.2	137.8	14,077	12,554	164.7	146.1
22 Net capital formation for business use	12,599	12,466	185.9	183.9	10,050	10,383	198.7	205.4	9,355	10,383	214.5	238.0
23 Net private durable capital formation	9,335	7,517	191.8	154.4	9,557	6,630	184.2	127.8	9,392	6,630	186.9	132.0

[1] Includes net addition to claims against foreign countries.

ended in 1932-33. Similarly, the major source of the shortage in business construction is not that its relative rise during the expansion was so much less than that for other components: it is again in the extraordinary severity of its contraction after 1929. In three components only was a great severity in decline matched or more than matched by an extraordinarily large recent rise: net flow to inventories, flow of producers' durable commodities, and to a smaller extent, flow of consumers' durable commodities.

6. Decline from 1937 to 1938

The estimates of commodity flow and gross capital formation for 1938 are subject to a wider margin of error than the measures for the earlier years. Moreover, at the present time it is impossible to say with certainty whether the contraction that began in 1937 will have its annual trough in 1938 or in some later year. Nevertheless, it may be of interest to survey briefly the decline from 1937 to 1938, bearing in mind that the results of this survey may have to be revised considerably in the light of developments yet to come.

a] The magnitude of the decline in gross commodity product from 1937 to 1938 was substantial, in both current and 1929 prices. We may compare it with the decline in gross commodity product during the reference contractions since 1919.

Change in Gross Commodity Product from 1937 to 1938 compared with Changes during Reference Contractions

(*millions of dollars*)

	Change from 1937 to 1938	Changes during Reference Contractions: from 1920 to 1921	from 1923 to 1924	from 1926 to 1927	from 1929 to 1932 (per year)
Current Prices	—8,939	—19,614	—2,803	—1,704	—13,107
1929 Prices	—4,489	— 3,499	—1,122	+1,480	— 8,728

The decline from 1937 to 1938 was less substantial than during 1929-32, even when the latter is reduced to a per year basis; but more substantial than the declines in the preceding reference contractions, with the sole exception of 1920-21 in current prices. Were we to express the absolute changes as percentages of the values of gross commodity product at the peaks, the differences referred to above would be somewhat less but would still remain significant. Thus with respect to the absolute and relative magnitudes of the contraction in gross commodity product, the decline from 1937 to 1938 lies between the very severe contraction of 1929-32 and the milder contractions of the first post-War decade.

b] When measured in current prices, most of the components in Table 1 declined from 1937 to 1938. Only public construction and the net change in claims against foreign countries rose, the latter continuing its movement in a direction opposite to the cycle in general business conditions. But not all the components that declined contributed equally to the decline in gross commodity product; nor were their declines of equal relative severity when measured in percentages of their values in 1937. The components contributing most to the decline in gross commodity product were net flow to inventories (41 per cent); flow of consumers' durable commodities (25 per cent); flow of producers' durable commodities (19 per cent); flow of perishable commodities (13 per cent). In respect of severity of relative decline from peak value in 1937, net flow of inventories (109 per cent), flow of consumers' durable (29 per cent), and flow of producers' durable (24 per cent), again lead the list; but are followed by business construction (24 per cent) rather than by the flow of perishable commodities whose relative decline was only 5 per cent.

c] The adjustment for price changes, as in all preceding comparisons, affects most drastically the measures for perishable and semidurable commodities. In both groups the decline from 1937 to 1938 in current prices disappears when converted to 1929 prices. As a result, the components whose contraction accounts largely for the decline in gross commodity product in 1929 prices are net flow to inventories, flow of consumers' durable, and flow of producers' durable. These three components, together with a fourth, business construction, show also the most conspicuous relative declines in 1929 prices, when the values for 1938 are compared with those for 1937.

d] Because the reference contractions since 1919 are marked by a divergent behavior of components, it is difficult to establish for them the percentage distribution of the declines in commodity product among changes in the components. But, generally, the contractions of 1920-21, 1923-24, and 1926-27 are marked by extraordinarily large percentage shares contributed by declines in the net flow to inventories; by consistently significant contributions to the decline in gross commodity product made by changes in the flow of consumers' and of producers' durable commodities; and by an inconsistent behavior of all other components. The contraction of 1929-32, on the other hand, is distinguished by the fact that the decline is shown by all the components; and that the share contributed by the decline in the net flow to inventories, while substantial, is markedly lower than in the preceding contractions. This statement is true not only of the period 1929-32 as a whole, but also of the distribution of the decline in gross commodity product in the first year of the depression, viz., from 1929 to 1930.

The pattern of the decline in gross commodity product from 1937 to 1938 resembles that of the declines during the reference contractions of 1920-21, 1923-24, and 1926-27 in two respects: the failure of the flow of perishable and semidurable commodities, when measured in constant prices, to contract; and the very high share that the decline in the net flow to inventories contributes to the total decline in gross commodity product. Also, the appreciable rise in public construction and in net changes in claims against foreign countries makes the decline from 1937 to 1938 dissimilar to the contraction of 1929-32, when the latter is considered as a whole. On the other hand, the fact that both residential and business construction contributed to the decline in gross

commodity product from 1937 to 1938 makes it similar to that from 1929 to 1932, for none of the preceding three contractions was characterized by a decline in both these branches of construction activity. But in view of the rather small magnitude of the contraction in residential construction from 1937 to 1938, it may be doubted that the similarity in this respect of the recent decline to that of 1929-32 is significant.

7. Summary and Qualifications

The tentative conclusions of our analysis of commodity flow and capital formation during the recent expansion and subsequent decline may now be briefly summarized.

a] The rise in commodity product in 1929 prices during the recent expansion was either equal to or slightly less than during the 1921-29 expansion or, on the average, during the reference expansions since 1919. Differences in the result of the comparison were due to differences in the period over which the rise during the recent expansion and that of 1921-29 was measured.

b] In this rise in commodity product (in 1929 prices) during the recent expansion the share of capital formation was larger than in the rise during the 1921-29 expansion or, on the average, during the average reference expansions since 1919. This was also true of the share of business capital formation including net flow to inventories; while the shares of business capital formation excluding inventories and of total private durable capital formation were at least equal to their shares in the rise in commodity product during earlier expansions. Similarly, the rate of relative intensity of participation of total capital formation, or of the variants of business capital formation, was as high as or higher than during the earlier expansions studied.

c] In 1929 prices the levels of total commodity product, consumers' outlay on commodities, and capital formation were by the end of the recent expansion only slightly below pre-depression levels. But this was not true of capital formation excluding net flow to inventories; of total business capital formation excluding net flow to inventories; or of total private durable capital formation. They show by the end of the recent expansion (i.e., in 1937 or 1936-37) material shortages as compared with the pre-depression levels, largely owing to shortages in two components: residential and business construction.

d] Analysis of differences among components in their decline during the contraction that terminated in 1932 or 1932-33 and in their rise during the subsequent expansion suggests that the greater the absolute or relative decline during the contraction the greater the absolute or relative rise during the subsequent expansion; that differences in the severity of the decline during the contraction are the dominant factors in determining differences in the extent of shortage at the end of the expansion as compared with pre-depression levels; and that differences in the relative rise during the expansion are not important elements in determining differences in the shortage at the end of the recent expansion. These conclusions are true of components, excluding the relatively unimportant net addition to claims against foreign countries and the much more important net flow to inventories. Thus, for the flow of commodities to users and construction it may be said somewhat inaccurately but pointedly that the failure to recover by 1937 or 1936-37 was due much less to the weakness of the preceding rise from 1932 than to the extreme severity of the contraction that terminated in 1932 or 1932-33.

e] The decline in gross commodity product from 1937 to 1938, so far as it can be measured now, is less substantial than that from 1929 to 1932, even when the latter is reduced to a per year basis; but significantly larger than the declines in the reference contractions of 1920-21, 1923-24, and 1926-27 (with the single exception of that of 1920-21 in current prices). The components that contributed most to the recent decline are net flow to inventories, flow of consumers' durable commodities, and flow of producers' durable. Besides these three components, business construction also showed a marked relative decline from 1937 to 1938. Because of the unusually large share contributed to the 1937-38 decline by net flow to inventories and the failure of the flow of perishable and semidurable commodities, in 1929 prices, to contract, the decline from 1937 to 1938 appears more similar to the declines in gross commodity product in the reference contractions of the first post-War decade than to the contraction of 1929-32 (even when the latter changes are observed only for the first year, 1929-30). But these statements concerning the character of the recent decline must await confirmation.

The tentative character of all our conclusions should be kept in mind. We deal here with estimates subject to errors that are likely to be particularly sizable for the preliminary measures for recent years. The broad scope of the components distinguished may conceal divergence in movement or levels among various categories of goods and services included in each component. The annual character of the data precludes a close analysis of short term changes of the type associated with business cycles. We have followed the procedure of studying changes in the various components within fixed periods, without taking cognizance of the possible leads or lags in their movements compared with the movement of commodity product. We thus deal with data that veil a great deal of the underlying movement; and some of the similarities and differences may be illusions attributable to the crudities of the measures or procedures. These limitations affect especially our measures for the average of the reference expansions, since it is for short periods such as are involved in reference expansions that annual estimates are especially deficient.

Another source of difficulties becomes apparent in any attempt to interpret more fully our tentative conclusions. Can we say, in the light of our analysis, that the recent rise, in which the share of net flow to inventories was large and of private construction was small, represents a short reference cycle expansion rather than one of a long cycle similar to that of 1921-29; that the recession begun in 1937 and continuing through at least the early part of 1938 is, therefore, likely to be short lived, with private construction declining relatively less than the other components of business capital formation; that during the subsequent expansion private construction may regain a standing within

capital formation and commodity product similar to its standing before 1929; that the failure of private capital formation to recover fully during 1932-37, so much commented upon, was due partly to the severity of the preceding contraction in construction, partly to a lag in the latter, a lag that did not occur during the 1920's because of the peculiar conditions of housing shortage and shortage of business structures resulting from the War, but one that may be a not unusual feature of most expansions in the longer cycles? These conjectures seem plausible, but they are merely conjectures. No definitive evidence as yet exists for a clear distinction between the shorter reference cycles and longer cycles general to the economy as a whole; no sufficient record exists for years before 1919 to establish any characteristics of the interrelation between private construction and the flow of manufactured commodities in the cyclical processes; and we have not tried to take into account other factors, quantitatively measurable or qualitatively recordable, that would overcome the limitations of the short and peculiar historical period covered by our estimates.

The conclusions are thus tentative and their interpretation difficult because of the paucity of data and lack of thoroughgoing scrutiny of the various factors in the interrelation of commodity flow, capital formation, and the other elements in the total economic activity of the nation. And yet the discussion may be useful in providing tentative leads for further study and adding to the none too bountiful data on the recent changes in our economic system.

APPENDIX

Derivation of Preliminary Estimates for 1934-1938

I. Flow of Commodities to Consumers

Perishable: From the retail sales estimates of the Department of Commerce (*Domestic Commerce*, March 20, 1939) we took sales by stores in the following groups: foods, beer and liquor, eating and drinking, filling stations, and drugs. The totals were used as an index to extrapolate the 1933 figure of the cost to consumers of perishable commodities. By combining the Bureau of Labor Statistics wholesale price indexes for foods, anthracite coal, petroleum products, and drugs and pharmaceuticals, and utilizing the combined index to extrapolate the price adjustment index for 1933 (the latter was secured by dividing the 1933 figure for perishable commodities in current prices by that in 1929 prices; see *Commodity Flow and Capital Formation*, Volume One, Table V-10), we derived an index needed in the adjustment for price changes.

Semidurable: Retail sales of department, dry goods, general merchandise, mail order, variety and apparel stores were obtained from the Department of Commerce estimates and used to extrapolate the 1933 figure. The corresponding price index was secured by using the Bureau of Labor Statistics indexes of prices of shoes, textile products, and automobile tires and tubes to extrapolate the price adjustment index previously obtained by us for 1933 (*Commodity Flow*, Table V-10).

Consumers' Durable: Retail sales of the automotive, furniture and household groups, and jewelry stores, as estimated by the Department of Commerce, were used to extrapolate the 1933 figure. The corresponding price index was secured by using the Bureau of Labor Statistics price indexes of motor vehicles and house-furnishing goods to extrapolate the price adjustment index previously obtained by us for 1933 (*Commodity Flow*, Table V-10).

The reliability of the estimates for the above groups is affected by three factors: (a) the reliability of the Department of Commerce sales data; (b) the validity of using types of stores as indexes of the movement of commodity groups; (c) the validity of using retail sales as an index of cost to consumers. Little can be said about (b) and (c) except that they are not likely to affect significantly the reliability of the estimates. As to (a), experience has shown the Department of Commerce estimates to be quite accurate: its estimate of retail sales for 1935 was very close to the 1935 Census figure. Since 1935 the Department of Commerce has improved its sample of retail stores and there are no apparent reasons to doubt the accuracy of the annual estimates. Moreover, for 1937 the results of the *Retail Census Survey* were available as a check.

II. Producers' Durable Commodities

The 1935 and 1937 estimates of producers' durable commodities (excluding horses, mules, and milk cows) were based on the movement from 1933 to 1935 and from 1935 to 1937 of the aggregate value of production of all pertinent commodities reported in the 1935 and 1937 *Census of Manufactures*. Figures for 1934 and 1936 were estimated from the movement of gross income, as reported in *Statistics of Income*, of corporations manufacturing locomotives and railroad equipment, factory machinery and equipment, electrical machinery and equipment, miscellaneous machinery, office equipment, etc., and hardware, tools, etc.; together with the value of output of motor trucks reported in the 1938 edition of *Automobile Facts and Figures*. The tentative estimate for 1938 was based on sales data in *Dun's Review*, May 1939, for the following industries: electrical apparatus and appliances, machine shop products, agricultural machinery, railroad equipment, aircraft, office and business machinery and heavy machinery; and on the motor truck production estimate of the Automobile Manufacturers' Association.

A price index for 1934-37 was secured by using Solomon Fabricant's index of producers' durable goods to extrapolate the price adjustment index previously obtained for 1933 (*Commodity Flow*, Table V-10). For 1938 the Bureau of Labor Statistics wholesale price index for farm machinery was used as an extrapolater.

Values for horses, mules, and milk cows in both current and 1929 prices were estimated by the method used in *Commodity Flow* (see notes to Table V-9 for details). However, revised data of the Department of Agriculture were utilized and the estimates are thus not strictly comparable with those made for 1933 and earlier years. This lack of comparability is minor.

The question of reliability arises largely in connection with

manufactured products. Our estimates for 1934-37 are good approximations, based as they are on Census data for 1935 and 1937 and *Statistics of Income* data for 1934 and 1936; although, of course, the use of manufacturers' values implies constant mark-ups. The estimate for 1938 depends upon the reliability of the Dun and Bradstreet data. Their sample for the machinery industries covers about 45 per cent of the Census total as of 1937.

III. CONSTRUCTION

Residential: The components of total residential construction were estimated as in the earlier years (*Commodity Flow*, Table VI-7 and notes). David L. Wickens' estimates of nonfarm residential construction were utilized directly; major additions and alterations were approximated from the permit data; and farm dwellings were estimated in the same manner as previously.

For 1936-38, however, the estimate of new residential construction, excluding farm, was extrapolated by the Department of Commerce estimates published in the *Survey of Current Business*, December 1938.

Business: Nonresidential construction, excluding farm, was estimated from Dodge contract data for commercial, factory, religious and memorial, and social and recreational buildings; major additions and alterations were approximated from building permit data; farm construction was obtained directly from Department of Agriculture estimates. For 1937 and 1938 total new nonresidential excluding farm was extrapolated by Department of Commerce estimates of nonresidential construction.

The different types of public utility construction were estimated from sources described in *Commodity Flow*, Note A to Table VI-8, and from the estimates of Peter Stone in *Construction Expenditures and Employment:* 1936-1938, published by the Works Progress Administration.

Public: Extrapolation for 1932-38 was based on Department of Commerce estimates. The use of this series revises slightly the values for 1932 and 1933 in *Commodity Flow*, Table VI-9.

The construction estimates for 1934-37 are of the same degree of accuracy as those for earlier years. The estimates for 1938 are probably less reliable although two independent investigators, Harold Wolkind (Department of Commerce) and Peter Stone (Works Progress Administration), arrived at approximately the same percentage changes from 1937 to 1938 in the different types of construction.

IV. INVENTORIES

1. *Derivation:* Although only the totals of net changes in inventories are presented, the basic estimates, especially those in current values, were made in considerable detail.

a] *Farm:* Inventories in the hands of farmers were estimated by the method used for the earlier years, described in *Commodity Flow*, Table VII-4 and the notes. Since revised data of the Department of Agriculture were utilized, the estimates are not directly comparable with those for 1933 and earlier years; the lack of comparability is minor.

b] *Manufacturing:* The availability of *Statistics of Income* for 1934-36 made it possible to estimate corporate inventories for these years as outlined in *Commodity Flow*, Tables VII-1 and VII-2, and the notes to them. For 1937 data from the 1937 *Census of Manufactures* were used to extrapolate the 1936 estimate derived from *Statistics of Income* data. For 1938 data published in *Dun's Review*, May 1939, were used to extrapolate the 1937 estimate.

c] *Mining:* For 1934-36 data from *Statistics of Income* were used. For 1937 mining, service, and miscellaneous inventories were based on the 1936 relationship of the three groups to a total including manufacturing and transportation inventories. A similar procedure was followed for 1938, inventories for the three groups and for transportation being based on the 1937 relationship to manufacturing inventories alone.

d] *Service:* A procedure corresponding to that used for mining was followed.

e] *Transportation and public utilities:* Estimates for 1934-36 were based on *Statistics of Income* data. For 1937 an index of ratios derived from materials and supplies held by and gross revenues of Class I steam railways, electric railways, pipe lines, carriers by water, telephone companies, and telegraph and cable companies was applied to a 1936 ratio calculated from estimated inventories for all transportation and public utility companies. The resultant ratio was then applied to the gross revenue total for 1937. For 1938 see mining under (c) above.

f] *Finance and nature of business not given:* Estimates for 1934-36 were derived from *Statistics of Income* data. For 1937 and 1938 see mining under (c) above.

Translation into 1929 prices and the calculation of net changes for the groups described in (b) through (f) was made in much less detail than the derivation of inventories in current values. Inventories held in manufacturing, mining, transportation and public utilities, service, finance, and nature of business not given industries, were added. Price indexes for 1933 were derived by comparing the aggregates of these groups in current and 1929 prices, and the total net changes in 1929 and current prices. These 1933 price indexes were then extrapolated by the Bureau of Labor Statistics wholesale price index for all commodities other than farm products. In determining for each year whether cost or market was lower, the annual average was assumed to represent cost and the average of December and the following January market.

g] *Construction:* For 1933-36 inventory-sales ratios for construction corporations were derived from *Statistics of Income* data. They were used to extrapolate a 1933 ratio based on the construction inventory estimate for that year and new construction. Inventories for 1934-36 were then estimated by applying the adjusted ratios to the value of new construction in each year. A similar procedure was followed for 1937 except that inventory-sales ratios for lumber and building material wholesalers reported in the *Census of Business: 1937-38, Wholesale Distribution* were used. For 1938 inventory-sales ratios for lumber, millwork and other building materials, and plumbing and heating supplies wholesalers reported in *Dun's Review*, May 1938, were used to extrapolate the previously derived 1937 figure.

Translation of these construction inventory estimates into 1929 prices and the subsequent calculation of net changes was accomplished by means of the price index used for earlier years (*Commodity Flow*, Note C to Table VI-1), the Bureau of Labor Statistics wholesale price index for building materials. The 1933 adjustment to this index (see Note C) was applied in all succeeding years.

h] *Trade:* Wholesale and retail trade in current values were estimated separately. For wholesale trade sales estimates prepared by the Department of Commerce were taken for 1933-35 (*Domestic Commerce*, February 28, 1937, January 30, 1938). The 1933 and 1935 'estimates' are actual Census data; 1934 alone is an estimate. The Department of Commerce has provided also estimates of the sales of wholesalers proper for 1936-38 (*Domestic Commerce*, April 10, 1939). These were used to extrapolate the estimates of total wholesale sales available for the earlier years.

We computed an inventory-sales ratio for 1933 based on our inventory estimate for that year and on Census sales figures used by the Department of Commerce, as well as inventory-sales ratios based entirely on wholesale Census data for 1933 and 1935. The 1935 ratio was adjusted on the basis of the two ratios for 1933, the adjusted percentage being applied to the 1935 wholesale sales figure.[1] In order to make estimates for the other years indexes of inventory-sales ratios were calculated and applied to the adjusted 1935 ratio. For 1934 the movement between 1934 and 1935 of inventories and sales of corporations engaged in trade (*Statistics of Income*) was used. For 1936 and 1937 an index based on the *Census Survey of Wholesale Distribution* was used and for 1938 an index derived from Dun and Bradstreet data (*Dun's Review*, May 1939).

A similar technique was followed in estimating retail inventories. Of course, retail sales estimates (*Domestic Commerce*, April 10, 1939) and inventory data were used wherever available, i.e., except for the 1934 inventory-sales ratio index, which again was derived from all trade corporations. Moreover, Dun and Bradstreet inventory-sales ratios were used for 1936 and 1937 as well as for 1938.

In the adjustment for price changes the wholesale and retail inventory estimates were combined. Indexes derived by comparisons of the appropriate figures in 1933 (*Commodity Flow*, Tables VII-8, VII-9, and VII-10) were extrapolated by means of the Bureau of Labor Statistics wholesale price index for all commodities other than farm. An average of October and November was used to indicate cost, and the customary average of December and the following January for market.

The accompanying table shows the annual changes in stocks of monetary metals from 1932 to 1938 (for derivation see V below). Its components may be used to render the inventory estimates in Table 1 comparable with those in *Commodity Flow*.

	1932	1933	1934	1935	1936	1937	1938
				CURRENT PRICES			
Total change in stocks of gold and silver	+53	−182	+1,065	+2,173	+1,285	+1,643	+1,932
Change in inventory of gold resulting from net gold movements	+11	−173	+1,217	+1,739	+1,030	+1,386	+1,640
Change in inventory of gold and silver stocks	+42	−9	−152	+434	+255	+257	+292
				1929 PRICES			
Total change in stocks of gold and silver	+54	−178	+704	+1,397	+847	+1,053	+1,255
Change in inventory of gold resulting from net gold movements	+11	−173	+719	+1,027	+608	+819	+969
Change in inventory of gold and silver stocks	+43	−5	−15	+370	+239	+234	+286

2. *Reliability:* The availability of *Statistics of Income* for 1934-36 make the estimates for these years as reliable as those for the earlier years. Likewise the agricultural inventory estimates are equally accurate for 1934-38. (However, agricultural inventories as estimated are not strictly comparable with the estimates for earlier years because of the use of revised figures prepared by the Department of Agriculture.) Wholesale inventories, being based on a partial U. S. Census, are probably accurate also in 1937, as is the estimate of retail inventories based on Dun and Bradstreet data. No adequate checks for mining, service, and miscellaneous inventories in 1937 can be found at present; but transportation and public utility inventories, being based on comprehensive data, are fairly reliable. For 1938 all the estimates are tentative.

These comments concern the basic estimates in current values. The use of approximate price indexes to derive net changes naturally makes the latter less reliable. However, they seem to be the best that can be made on the basis of the available data, barring minor but laborious refinements.

V. OTHER COMPONENTS

Net changes in silver and gold stocks and in claims against foreign countries were estimated from the sources used for earlier years—*Annual Reports* of the Director of the Mint and the *Balance of International Payments in the United States*.

[1] These small corrections were necessary because of minor changes in the structure of the Wholesale Census from Census year to Census year. Since our estimates use the 1929 Census as a base we must make later Censuses as comparable with it as possible.

Commodity Flow and Capital Formation, 1932-1938

The accompanying table shows the net gold movements to and from the United States. If these are added to the figures for net addition to claims against foreign countries in Table 1, the resulting totals will be comparable with those in *Commodity Flow*.

	1932	1933	1934	1935	1936	1937	1938
				CURRENT PRICES			
Net gold movements	—11	+173	—1,217	—1,739	—1,030	—1,386	—1,640
				1929 PRICES			
Net gold movements	—11	+173	—719	—1,027	—608	—819	—969

Capital consumption data for 1934 and 1935 are based on final estimates in *Capital Consumption and Adjustment*.[2] For 1936 and 1937 Solomon Fabricant prepared preliminary estimates based primarily on a sample of a few hundred corporations reporting depreciation in *Moody's Industrials* and on available public utility data. Fire losses and residential and public depreciation and depletion were also estimated roughly.

The measures of capital consumption for 1934 and 1935 are as good as those for preceding years. For 1936 and 1937 they are admittedly rough, but their general stability over time makes tolerable approximations likely.

[2]These estimates are not strictly comparable with those used for earlier years because of minor revisions. Inasmuch as these revisions would but slightly affect our figures for the earlier years, we have not incorporated them.

The Annalist, on October 26, 1938, described the volume which this *Bulletin* brings up to date as representing "part of an exhaustive investigation into what makes the wheels of the so-called economic system revolve.

Whatever the more profound conclusions which this study, when finally completed, may lead to, this volume is an important contribution if only for the way in which it dispels some of the illusions which some popular writers have dangled before the eyes of the public. . . ."

OTHER REVIEWS

Ebb and Flow in Trade Unionism, by Leo Wolman (251 pp., $2.50)

The Society for the Advancement of Management Journal, May 1939 (review by Henry C. Metcalf)

"Dr. Wolman's analyses of the labor movement, as this reviewer can testify from first-hand group participation, always command deep interest and arouse serious reflection and animated criticism and discussion. Written more than three years ago, his book *Ebb and Flow in Trade Unionism* serves as an excellent background for understanding the 'modern period'. . . .

This volume is a realistic contribution to one of the gravest problems now engaging national attention—namely, what constitutes wholesome employer-employe relations? The analysis gives comprehensive figures on trade union membership, revealed in thirty-six tables and five charts, showing trade-union affiliations, stable and unstable memberships, growth in relation to working population, percentage of trade-union organization among employes, etc.

But Dr. Wolman goes beyond complete and authoritative figures on trade-union membership. He carries us over a broad discussion, as well, of the NRA trade-union era; the present split in the ranks of organized labor and many of the vital problems now facing us—problems of measurement as an index of organized labor's strength, highly important from the political angle; union growth and consolidation during 1897-1914; the vicissitudes of organized labor during the 1920's prosperity, and the influences of the 1930-1933 depression forces; the aftermath of war prosperity and the new era; the causes of the recent changes in unionism under the recovery administration. Here is clarified the important fact that the industrial form of labor organization 'has been widely and vigorously debated for the last several years'. The baffling administration problems, evoked by the NIRA Section 7a, that 'employees shall have the right . . . to bargain collectively through representatives of their own choosing', now testing the judicial calibre of the NLRB in deciding upon representation elections, is treated in realistic fashion.

Those who are attempting to predict what channels future labor organization will take will find the statistics of the past significant. Three unions—the craft building trades, non-affiliated railroad brotherhoods, and industrial coal-mining unions—have dominated the organized labor movement in this country. According to Dr. Wolman, 'The Next Years' for the labor movement cannot be predicted without determining the future labor policy of the government, the attitude of employes and employers toward collective bargaining, general business conditions, and internal relations of the labor movement.

This clear, concise, yet exhaustive, report is a distinct contribution to American labor literature. Its conclusion is that the A. F. of L. and labor generally have cast aside the traditional laissez-faire attitude and will in the future be more active in encouraging labor-government-industry harmony. In that triangle lies the formula for genuine industrial peace. Although much has happened in the labor world since 1936, those who are in search of the labor roots in our American economy will do well to ponder this carefully documented volume."

Studies in Income and Wealth, Volume Two, by the Conference on Research in National Income and Wealth (pp. 331, $3; together with Volume One, $5)

American Economic Review, June 1939 (review by Henry H. Villard):

"This volume, the second in a series of studies, contains reports presented at the December, 1937, meetings of the American Economic and the American Statistical Associations and the third meeting of the Conference in April, 1938, as well as subsequent discussion and correspondence. The purpose of the Con-

ference continues to be the stimulation of discussion and analysis of the problem of income and wealth measurement and the establishment of the implications of the various methods that may be used. As a result, no attempt is made to establish a consensus of opinion. Rather, as in the first volume, problems are analyzed by individual students and their results discussed by various members of the Conference, in the belief that proper formulation of the issues will ultimately lead to a more widely held consensus of opinion.

. . . In general, the reviewer cannot close without repeating his praise, contained in his review of the first volume, of the entire undertaking embodied in the Conference and of the scholarly level on which it has been conducted, as well as his hope that agreements on terms in other fields may be achieved in a similar fashion."

Capital Consumption and Adjustment, by Solomon Fabricant (271 pp., $2.75)

Economic History Review, May 1939 (review by B. Tew):

"The book is a scholarly piece of work; the statistics are generally well presented, the method of compiling them stated at length, and all the necessary reservations made in drawing conclusions from them."

Journal of the American Statistical Association, March 1939 (review by Arthur W. Marget):

"This is an admirable piece of work—a credit to its author and to the broader project of which it is a part. For all its compactness of presentation, it gives every evidence of a determination to utilize every bit of material that can be shown to be of significance for the problem in hand; the data are treated critically and yet with imagination; and—most important of all—there is evidence throughout of an awareness of the theoretical issues which both illumine and are illumined by the data that Dr. Fabricant has so patiently assembled."

Commodity Flow and Capital Formation, Volume One, by Simon Kuznets (502 pp., $5)

Economic History Review, May 1939 (review by E. H. Phelps Brown):

"The first purpose of this work was to measure the formation of new capital in the United States in the years since the war; but as this enquiry required the measurement of the value not only of new fixed equipment but also of the additions made to all kinds of stocks, it broadened until it covered the output of commodities of all kinds. When the findings are combined with those of two independent studies, of the depreciation of fixed equipment, and of the whole national income, there results a detailed record of the whole economy [See *Capital Consumption and Adjustment* and *National Income and Capital Formation*, 1919-1935; Ed.]. . . .

It is the purpose of the present volume to record the working up of the estimates stage by stage, and to tabulate data and findings in detail; the greater part of the book therefore consists in tables, and the commentary is directed chiefly to the questions of statistical method. Helped by excellent typography, this exposition is a model of fulness and clarity. Discussion of the significance of the results is largely deferred to a second volume, but some important conclusions suggest themselves even on a first perusal of the tables."

Report of the Committee on Prices in the Bituminous Coal Industry (144 pp., $1.25)

American Economic Review, March 1939 (review by Jules Backman):

"If this worth-while report by Professor Waldo Fisher and his Committee is typical of those to follow, it is a matter of keen regret that the National Bureau has been able to set up committees to survey only four other industries."

This *Report* is the first published product of the Conference on Price Research whose organization is described by Wesley C. Mitchell in *The National Bureau enters its Twentieth Year*, issued last month. There also was announced the creation, by the Conference on Price Research, of two permanent committees, one of which will in some measure fulfill Mr. Backman's hope. The Committee on Cost-Price Relationships, under Edward S. Mason of Harvard University, will cut across industrial lines. The other, on Bituminous Coal Prices, was felt desirable because the act creating the National Bituminous Coal Commission and providing for definite price fixing affords such an excellent laboratory case. Mr. Fisher's Committee is composed of H. N. Eavenson, Consulting Engineer; W. P. Ellis, Bituminous Coal Producers' Board; O. E. Kiessling, United States Bureau of Mines. John Maurice Clark is an advisory member.

One other Committee was formed after Mr. Backman wrote his review: on Distributional Costs and Pricing Policies at Retail, with Arthur Robert Burns as Chairman. Both its report and that of the Committee on Prices in the Steel Industry are in manuscript, under review by the Committees. The other three reports—of the Committees on Prices in the Automobile, Petroleum, and Textile industries—have been submitted to the Directors of the National Bureau. Upon approval they will be published as Volumes 2 and 3 of the Price Series.

The Structure of Manufacturing Production, A Cross-Section View, by Charles A. Bliss (231 pp., $2.50)

This, the 36th volume in its regular publication series, has been sent to contributing subscribers. Mr. Bliss has concentrated attention on "(1) the allocation of economic resources to the manufacture of different classes of goods; (2) the relative use of different productive factors".

National Bureau of Economic Research

A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Bulletin 75 1819 BROADWAY, NEW YORK *September 17, 1939*

Copyright, 1939, National Bureau of Economic Research, Inc.

DIFFERENTIALS IN HOUSING COSTS

DAVID L. WICKENS

HOUSING COSTS[1] in the United States vary widely with the location and character of residential properties. Within a locality variations are a matter of common knowledge, but the broad limits within which average costs vary between large and small cities and among different regions have not been so generally recognized, probably because of the absence of comprehensive and accurate measures of residential values and rents. Only when these differentials are measured and recognized can full advantage be taken of their significance in dealing with many problems in the housing field.

This Bulletin is concerned primarily with the measurement of these differentials, presenting quantitative estimates, many of which have hitherto been unavailable. It is based largely on *Residential Real Estate*[2] to be published by the National Bureau of Economic Research. It seeks to show the dollar costs of existing housing; in which sections of the country and types of cities or suburban areas housing is cheapest, in which most expensive; how costs of urban dwellings compare with rural; the costs of old and new houses and of various types of structures, such as apartments, two-family, and single-family dwellings.

Section 1 of this Bulletin emphasizes differentials according to geographic regions and according to density of population. The interrelationship between these differentials is discussed and their relative significance indicated. Section 2 describes other differentials and considers the influence of the more important factors that aid in their explanation and interpretation. These factors include differences arising from the age distribution of existing houses, differences in land costs, in materials used and facilities offered, and such other factors as differences in cost of living and the income levels of the population. Costs of new construction are also discussed briefly. The limitations of available information are indicated and the need for more thorough study of this entire field is stressed.

The quantitative measures of differentials in this Bulletin are primarily in terms of housing existing in 1930, the year of the most recent census. This raises two questions: (1) Are housing costs adequately described by measuring the costs of existing housing alone? (2) Are the differentials revealed for 1930, the year to which most of the basic data relate, indicative of current differentials?

The first question can be answered affirmatively. Although current discussions of housing run chiefly in terms of the cost of new dwellings, most of the houses purchased each year and most of the houses in which people live are not new.[3] In the continental United States in 1930, 29,900,000 families were living in approximately the same number of dwelling units. Of these families 23,235,000 were living in nonfarm localities, that is, in cities and small towns and in open country, but not on farms. Dwellings in nonfarm areas, including vacant dwellings, are estimated by the National Bureau at 24,400,000. The preponderance of old houses is best illustrated by the fact that only slightly more than 7,000,000 of the 24,400,000 nonfarm dwellings standing in 1930 were built in the ten preceding years, 1920-29, although the greatest building development in the recent history of American cities occurred during this period. Moreover, in the single year 1929 only 500,000 new dwelling units were erected. Farm dwellings are typically even older than urban. The Farm Housing Survey of 1934 conducted by the Bureau of Home Economics, Department of Agriculture, covering about 10 per cent of the farms of the country, showed that only 15 per cent of the farm houses were built during 1925-34; that 55 per cent were built before 1910.

To the second question the answer must be less definitive.

[1] In this Bulletin the term *housing costs* is used principally to mean the cost to users of existing housing. When there is occasion to refer to the cost of new housing the term *construction costs* is used.

[2] The data in it are derived largely from special tabulations of materials from the 1930 *Census of Population*, Vol. VI, and the *Financial Survey of Urban Housing*, 1934. The data presented relate primarily to value, rent, income, financing and construction, and are given in great detail. They provide many of the figures required for a thorough study of differentials. One of the purposes of this Bulletin is to show the possibility of and the need for such studies.

[3] Throughout this Bulletin the terms 'house', 'residence', 'dwelling unit', and 'dwelling' are used interchangeably. In every case the technical meaning is 'dwelling unit', including only housekeeping units, not non-housekeeping rooms in hotels, boarding houses, clubs, or institutions. Likewise the term 'apartment' means a family dwelling unit in a multi-family structure containing 3-or-more dwelling units, though it occasionally refers to the structure itself.

Data as comprehensive as those reported in the 1930 Census cannot again be available until another census reports residential rents or values. Some indication, however, of the stability of differentials between such contrasting years as 1930 and 1934 is afforded by comparing the figures reported for specific cities in the 1934 Financial Survey of Urban Housing with those for identical cities in 1930. Although average housing costs, expressed either as rents or values, dropped about one-third during the period, proportionate differentials among the cities remained fairly constant. It thus seems likely that the differentials prevailing in 1930 still hold, in the main. Values in 1939, though probably not as low as in 1934, are unquestionably lower than those for 1930, by about one-fourth, and this should be kept in mind when interpreting the tables in the light of present costs.

1 Differentials by Regions and by Density of Population

Regional differentials

Residential values and rents vary widely within a community because of differences in age, type of structure, size, materials and conveniences; the contrasts among different parts of the country are also marked. These regional differences reflect the underlying economic, social, and physical differences arising from climate, unequal natural resources, varying degrees of industrial and agricultural development, differences in income, and the extent of urbanization, as well as local customs and traditions. While this Bulletin is concerned primarily with measuring these housing differentials in monetary terms, it is evident that dollar values both conceal and imply differences in quality, age, and conveniences. They cannot fully reflect qualitative differences, which are difficult to isolate when groups of properties are considered. Thus, the regional values discussed here represent only in part comparable housing facilities in various sections of the country. The more important of the qualitative factors are discussed in Section 2.

If all houses the country over, whether owned or rented, are considered, the most expensive residential area is the Middle Atlantic States—New York, New Jersey, and Pennsylvania—where nonfarm residential values averaged $7,200 in 1930, 44 per cent more than the national average of $5,022. Second to the Middle Atlantic States were the industrial states of the East North Central Division—Michigan, Wisconsin, Illinois, Indiana, and Ohio—with an average value of $5,400, followed by New England and the Pacific Coast, where values were about $4,900 (Table 1).

Near the lower range of the scale, at a level of $3,500 and below, were the predominantly agricultural West North Central States, followed by the Mountain and Southern States. The East South Central area had the lowest regional average, $2,700, only slightly more than half as high as that for the country as a whole, and 63 per cent lower than the Middle Atlantic States.

The same general geographical contrasts appear both for houses that are occupied by their owners and those that are rented, although there is a much wider percentage variation in the values of the former. For the United States as a whole,

Table 1

Regional Differences in Values of Nonfarm Dwellings, 1930

	Average value in dollars			Relative value		
	All houses	Owner-occupied	Rented	All houses	Owner-occupied	Rented
United States	5,022	5,833	4,347	100	100	100
New England	4,885	6,748	3,467	97	116	80
Middle Atlantic	7,205	7,824	6,759	143	134	155
East North Central	5,376	5,927	4,803	107	102	110
West North Central	3,549	4,253	2,765	71	73	64
South Atlantic	3,397	4,883	2,406	68	84	55
East South Central	2,712	3,846	1,960	54	66	45
West South Central	2,967	3,712	2,412	59	64	55
Mountain	2,886	3,259	2,547	57	56	59
Pacific	4,918	5,765	4,169	98	99	96

owned houses were valued at an average of $5,833 in 1930, about one-third more than rented, which averaged $4,347. Top values for both types were in the Middle Atlantic States, where owner-occupied properties averaged $7,824 and rented properties $6,759, 34 and 55 per cent above the national figures.

Again, the Southern and Mountain regions were at the lower end of the scale. The lowest regional average for owner-occupied properties was in the Mountain States, $3,300; for rented dwellings, the East South Central States were lowest, with an average of $2,000. The reason why the general average value of all dwellings is higher in the Mountain States lies partly in the greater prevalence of ownership there than in the South.

Individual states present even greater differences (see Table A3). New York, with an average value for all dwellings of over $8,000 in 1930, stands far above other states. New Jersey with $7,700 and Illinois with $6,200 rank next highest, closely followed by Massachusetts, Connecticut, Rhode Island, Pennsylvania, Ohio, Michigan, and California. At the other extreme are several Southern and Mountain States, where all residential values averaged less than $3,000 in 1930.

The range of values for houses usually occupied by their owners, including those for sale, while at a considerably higher level than the average for all dwellings, shows much the same geographical variation. The spread between states is greater for this class of dwellings than for rented properties, ranging from New York's $9,000 to New Mexico's $2,200. The extremes arise because in New York State, and particularly in New York City, the high cost of housing limits ownership largely to families whose incomes are far above the average. In only 13 states were owned residences valued above the national average. In 20 states they averaged less than $4,000.

For rented dwellings values in 33 states were below $3,000. Only in New York and New Jersey did the average exceed $6,000; New York's high average of $7,670 contrasted with South Carolina's low of $1,539. The range of 1930 residential values by states may be summarized.

TABLE A3

Residential Real Estate, Average Value per Dwelling Unit in Dollars by Tenure, Population Group, State, Geographic Division, and on Farms, 1930

	TOTAL — Population Group*								OWNER-OCCUPIED — Population Group*								RENTED — Population Group*							
	All non-farm groups	100,000 or more	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500	Farm†‡	All non-farm groups	100,000 or more	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500	Farm†	All non-farm groups	100,000 or more	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500	Farm†
United States	5,022	6,483	5,698	5,064	4,407	3,822	2,734	1,242	5,833	7,795	7,198	6,196	5,309	4,584	3,382	1,511	4,347	5,751	4,416	3,832	3,347	2,882	1,987	826
New England	4,885	5,114	5,522	5,093	4,223	3,963	3,742	2,356	6,748	8,649	8,041	6,675	5,440	5,150	4,472	2,304	3,467	3,670	3,750	3,404	2,843	2,719	2,655	2,064
Maine	3,340	.....	4,737	4,166	3,242	3,057	2,613	1,542	3,915	.....	6,904	5,533	3,905	3,508	2,911	1,539	2,658	.....	3,431	2,918	2,497	2,414	2,118	1,261
New Hampshire	3,274	.....	3,836	3,703	2,917	3,401	2,569	1,844	4,041	.....	5,752	4,676	3,573	4,162	2,857	1,815	2,527	.....	2,658	2,834	2,325	2,618	2,130	1,476
Vermont	3,606	.....	.....	5,171	4,314	4,059	2,683	1,789	4,609	.....	.....	7,335	6,070	5,618	3,226	1,760	2,611	.....	.....	3,416	2,959	2,927	2,022	1,754
Massachusetts	5,172	5,024	5,880	5,372	4,491	4,732	4,006	3,310	7,237	8,207	8,288	6,829	5,683	6,419	4,736	3,221	3,700	3,711	4,108	3,617	2,893	2,730	2,757	2,798
Rhode Island	4,676	5,018	4,893	4,704	3,704	4,095	3,320	3,208	7,131	8,724	7,435	5,749	4,993	5,212	4,313	3,205	3,070	3,300	3,146	2,540	2,422	3,171	2,199	2,523
Connecticut	5,527	5,488	5,818	5,638	5,167	4,165	5,319	3,947	8,160	10,340	8,828	7,754	7,352	6,047	6,735	3,820	3,640	3,711	3,718	3,646	3,534	2,880	3,443	3,540
Middle Atlantic	7,205	8,312	7,600	6,762	6,482	5,894	4,287	2,375	7,824	9,514	9,052	7,766	7,401	6,673	4,997	2,341	6,759	7,797	6,424	5,545	5,272	4,711	3,219	2,278
New York	8,130	8,921	7,537	6,494	7,474	6,014	5,076	2,429	9,040	11,166	9,114	7,419	8,245	6,665	5,648	2,401	7,670	8,226	6,238	5,309	6,441	4,992	4,007	2,242
New Jersey	7,653	7,371	8,790	8,556	8,020	7,011	5,505	3,496	8,930	9,052	11,395	9,653	9,155	7,891	6,158	3,509	6,521	6,578	7,248	6,929	6,196	5,461	4,210	3,038
Pennsylvania	5,617	6,840	6,625	5,940	5,307	5,410	3,396	2,164	6,183	7,173	7,542	6,791	6,037	6,192	4,062	2,116	5,006	6,523	5,670	5,052	4,443	4,307	2,591	2,202
East North Central	5,376	6,457	6,175	5,401	4,506	4,079	2,877	1,750	5,927	7,656	7,188	6,221	5,130	4,557	3,102	1,784	4,803	5,691	4,996	4,169	3,463	3,225	2,296	1,716
Ohio	5,138	5,708	6,673	5,149	4,685	4,483	3,111	1,740	5,973	7,097	8,141	5,990	5,440	5,081	3,493	1,749	4,251	4,688	5,173	3,908	3,487	3,459	2,436	1,655
Indiana	3,882	5,086	4,652	3,869	3,221	2,978	2,292	1,477	4,254	5,971	5,397	4,338	3,585	3,263	2,478	1,488	3,438	4,313	3,906	3,274	2,726	2,524	1,963	1,428
Illinois	6,165	7,159	6,871	6,423	5,338	4,218	2,897	1,956	6,859	8,754	8,093	7,618	6,183	4,766	3,262	2,024	5,502	6,431	5,452	4,596	3,877	3,222	2,248	1,831
Michigan	5,586	6,978	5,971	5,216	3,945	4,304	2,881	1,694	5,914	7,965	6,547	5,699	4,244	4,688	3,084	1,669	5,190	6,183	5,207	4,445	3,399	3,549	2,451	1,699
Wisconsin	4,911	5,995	5,694	5,816	4,238	3,914	3,067	1,984	5,391	6 905	6,507	6,487	4,620	4,287	3,469	1,977	4,268	5,330	4,553	4,679	3,453	3,212	2,310	1,959
West North Central	3,549	4,502	4,214	3,895	3,608	3,159	2,419	1,677	4,253	6,088	5,102	4,652	4,254	3,675	2,837	1,827	2,765	3,335	3,264	3,021	2,781	2,431	1,781	1,432
Minnesota	3,928	4,696	.....	4,087	3,447	3,538	2,635	1,804	4,697	6,048	.....	4,807	3,944	4,042	3,033	1,855	2,987	3,406	.....	3,186	2,693	2,689	1,951	1,668
Iowa	3,415	4,103	4,164	4,016	3,564	3,358	2,539	2,387	3,998	5,036	4,994	4,747	4,280	3,930	2,980	2,716	2,634	3,138	3,227	3,148	2,641	2,505	1,814	2,013
Missouri	3,859	4,703	4,203	4,310	3,951	2,836	2,292	1,188	4,975	7,175	5,317	5,479	4,790	3,459	2,752	1,303	2,939	3,424	3,170	2,883	2,938	2,087	1,644	940
North Dakota	3,004	.....	5,197	4,389	3,825	2,972	2,158	1,520	3,234	.....	6,498	4,951	4,317	2,946	2,350	1,649	2,729	.....	4,194	3,918	3,335	3,009	1,864	1,259
South Dakota	3,107	.....	4,565	4,098	2,994	3,526	2,456	1,548	3,577	.....	5,538	4,865	3,426	4,026	2,865	1,702	2,585	.....	3,729	3,405	2,553	3,002	1,939	1,346
Nebraska	3,470	4,134	4,669	3,985	3,681	3,134	2,655	1,852	4,082	5,013	5,626	4,783	4,387	3,591	3,144	2,189	2,670	3,212	3,573	3,042	2,774	2,469	1,886	1,465
Kansas	2,843	3,364	3,698	3,227	3,206	2,740	2,170	1,394	3,273	4,017	4,331	3,742	3,701	3,070	2,516	1,595	2,290	2,685	2,894	2,636	2,567	2,293	1,647	1,099
South Atlantic	3,397	5,163	4,093	3,589	3,445	2,960	2,086	876	4,883	7,003	6,496	5,328	4,882	4,283	3,113	1,149	2,406	3,920	2,811	2,435	2,371	1,953	1,373	524
Delaware	4,543	5,547	.....	.....	.....	3,828	3,310	1,929	5,706	7,268	.....	.....	.....	4,939	4,121	1,969	3,366	4,115	.....	.....	.....	2,570	2,259	1,724
Maryland	4,552	5,074	4,796	4,499	4,611	3,925	3,568	2,183	5,646	6,281	6,831	6,049	6,287	5,159	4,478	2,231	3,296	3,816	3,428	3,211	2,792	2,555	2,128	1,818
District of Columbia	7,025	7,025	.....	.....	.....	.....	.....	6,500	9,555	9,555	.....	.....	.....	.....	.....	6,202	5,466	5,466	.....	.....	.....	.....	.....	3,529
Virginia	3,334	4,475	3,686	4,327	3,797	3,458	2,407	1,326	4,529	6,678	5,379	6,032	5,075	4,818	3,293	1,452	2,381	3,393	2,587	2,955	2,565	2,152	1,488	843
West Virginia	3,016	.....	5,158	4,746	4,145	3,711	1,832	1,009	4,549	.....	7,155	6,106	5,321	4,488	2,875	1,063	2,122	.....	3,733	3,405	3,129	2,972	1,350	713
North Carolina	2,813	.....	4,300	3,184	3,194	2,947	1,794	733	4,116	.....	6,898	4,970	4,593	4,341	2,515	900	1,945	.....	2,918	2,082	2,089	1,870	1,265	538
South Carolina	2,271	.....	3,589	3,181	2,686	2,536	1,496	585	4,016	.....	6,853	5,426	4,422	4,091	2,501	920	1,539	.....	2,352	2,021	1,716	1,559	1,115	386
Georgia	2,640	4,181	3,033	2,853	2,529	2,126	1,775	546	4,119	6,569	5,672	4,519	3,753	3,454	2,768	835	1,946	3,209	2,211	2,017	1,778	1,477	1,236	389
Florida	3,156	3,972	4,394	3,565	4,093	2,774	1,870	1,072	4,486	5,767	6,406	4,992	5,557	3,858	2,673	1,235	2,318	3,055	2,965	2,526	3,009	1,915	1,366	450
East South Central	2,712	3,926	3,777	2,897	2,873	2,425	1,674	575	3,846	5,640	5,338	4,281	4,105	3,277	2,392	790	1,960	2,886	2,749	2,018	1,931	1,724	1,196	382
Kentucky	3,025	4,270	4,229	3,562	3,270	2,748	1,839	760	4,108	5,728	5,707	4,994	4,379	3,603	2,591	853	2,183	3,248	3,114	2,288	2,211	1,960	1,266	548
Tennessee	2,899	3,701	3,823	3,200	2,623	2,404	1,762	683	3,954	5,417	5,217	4,511	3,634	3,190	2,399	848	2,152	2,810	2,774	2,232	1,878	1,701	1,237	459
Alabama	2,410	3,829	3,235	2,697	2,585	2,138	1,449	458	3,799	6,118	4,868	4,196	4,355	3,063	2,259	691	1,700	2,659	2,361	1,893	1,615	1,513	1,071	319
Mississippi	2,229	.....	3,469	2,673	2,762	2,407	1,614	441	3,068	.....	4,979	3,815	3,916	3,205	2,151	694	1,674	.....	2,532	1,983	1,922	1,756	1,258	330
West South Central	2,967	4,403	3,787	3,164	2,907	2,520	1,684	670	3,712	6,080	5,073	3,911	3,632	3,082	1,990	965	2,412	3,436	2,892	2,577	2,261	1,995	1,434	474
Arkansas	2,255	.....	3,802	3,050	2,698	2,293	1,438	457	2,872	.....	5,083	3,901	3,494	2,996	1,737	622	1,771	.....	2,815	2,453	2,020	1,711	1,203	348
Louisiana	2,981	4,317	4,038	2,880	2,413	2,224	1,488	517	4,137	7,489	5,732	3,985	3,137	2,930	1,791	819	2,315	3,113	2,995	2,075	1,841	1,640	1,272	346
Oklahoma	3,032	5,202	3,615	3,403	2,965	2,437	1,632	704	3,440	6,584	4,294	3,789	3,444	2,766	1,726	1,001	2,710	4,345	2,976	3,107	2,549	2,112	1,555	503
Texas	3,091	4,186	3,728	3,119	3,026	2,747	1,868	816	3,878	5,512	5,007	3,946	3,852	3,285	2,268	1,155	2,472	3,306	2,867	2,427	2,250	2,208	1,522	575
Mountain	2,886	4,170	3,920	3,771	3,122	2,727	1,859	1,102	3,259	5,156	4,506	4,374	3,476	2,876	1,952	1,152	2,547	3,314	3,425	3,213	2,780	2,576	1,775	891
Montana	2,783	.....	3,856	3,544	3,488	2,752	1,856	969	2,936	.....	4,270	3,998	3,846	2,836	1,886	1,018	2,651	.....	3,591	3,164	3,159	2,656	1,828	777
Idaho	2 502	.....	.....	3,804	3,126	2,790	1,795	1,238	2,728	.....	.....	4,427	3,351	3,015	1,885	1,306	2,278	.....	.....	3,247	2,860	2,550	1,709	1,015
Wyoming	2,931	.....	.....	3,830	3,761	3,406	2,204	1,052	3,567	.....	.....	4,594	4,505	3,878	2,597	1,063	2,517	.....	.....	3,260	3,153	3,064	1,985	871
Colorado	3,225	4,250	3,351	3,489	2,964	2,472	1,950	1,185	3,791	5,317	3,694	4,082	3,296	2,673	2,212	1,267	2,691	3,373	2,948	2,856	2,593	2,233	1,704	992
New Mexico	2,100	.....	4,133	3,445	2,967	2,498	1,310	601	2,171	.....	4,874	3,980	3,369	2,575	1,148	608	2,030	.....	3,422	2,921	2,602	2,419	1,469	513
Arizona	2,823	.....	4,680	.....	2,705	3,014	2,007	1,229	3,182	.....	6,085	.....	2,883	3,447	2,097	1,254	2,581	.....	3,848	.....	2,593	2,781	1,940	925
Utah	3,026	3,985	3,588	3,518	2,931	2,420	1,936	1,472	3,398	4,819	4,159	4,028	3,314	2,427	2,088	1,527	2,568	3,169	2,910	2,650	2,278	2,411	1,718	1,044
Nevada	3,157	.....	.....	5,652	3,795	3,511	1,928	1,748	3,567	.....	.....	6,790	4,892	3,933	1,846	1,766	2,856	.....	.....	4,707	3,249	3,166	1,988	1,350
Pacific	4,918	5,687	5,515	5,037	4,370	3,747	3,141	1,820	5,765	7,062	6,583	5,777	4,909	4,123	3,524	1,919	4,169	4,711	4,421	4,256	3,781	3,309	2,715	1,265
Washington	3,638	4,439	3,558	3,834	3,063	2,996	2,441	1,429	3,859	4,742	3,743	3,997	3,251	3,000	2,702	1,476	3,365	4,087	3,285	3,656	2,835	2,992	2,079	1,159
Oregon	3,653	4,629	4,238	4,254	3,565	3,049	2,370	1,410	4,068	5,273	4,776	4,584	3,709	3,196	2,653	1,462	3,162	3,866	3,469	3,949	3,399	2,870	2,024	1,135
California	5,402	6,096	5,707	5,533	4,626	4,145	3,637	2,215	6,634	8,131	6,915	6,516	5,282	4,715	4,181	2,396	4,439	4,889	4,515	4,492	3,922	3,500	3,100	1,381

SOURCE: *Residential Real Estate.*

* Based on number and aggregate value of all units, including vacant.

† Average value of farm dwelling plus average value of one acre of land.

‡ Average value of all farm dwellings includes value of farm managers' dwellings.

AVERAGE BY STATES[1]	NUMBER OF STATES All Houses	Owned	Rented
Under $2,000	0	0	6[2]
$2,000–3,000	15	4	27[3]
3,000–4,000	20	16	7
4,000–5,000	3	15	4
5,000–6,000	7	5[4]	2
6,000 and over	3	8[5]	2
All groups	48	48	48

[1]The separate state figures are in Table A3.
[2]Principally the 'Old South', Virginia to Arkansas.
[3]The rest of the South and all the Plains and Mountain states.
[4]Maryland, Delaware, Ohio, Michigan, Wisconsin.
[5]Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Illinois, California.

Regional and state differences presented thus far are all in terms of estimated market values. They indicate levels at which, in 1930, dwellings could be purchased for occupancy or investment. Houses are rented, however, by slightly over half of the American people. For this group rents, rather than values, are of immediate significance. That there is a close, though not perfect relationship between values and rents charged is clear. Over a period, values of rented properties tend to approximate the capitalization of their earning power in the form of rents. Thus, as might be expected, the general pattern of geographical differentials in rents is similar to that of property values. However, rents are better indicators of differentials, partly because rents and incomes are both current items and can be ascertained more accurately.

In 1930 rents for all types of dwellings averaged approximately $364 per year for the country as a whole, about 8.4 per cent of the average value of all rented properties. By 1934 rents had declined about one-third. For 1938 they were 75.1 per cent of the April 1930 average in representative cities, according to the index of the United States Bureau of Labor Statistics.[4] The variation between broad regions was wide, ranging from the Middle Atlantic States' high average of $40 a month to the Mountain States' $22 and the East South Central States' $16, the latter about one-half the typical national rent (Table 2). A concentration of high rents is evident in the industrial states of the North and East, the Mid-West, and in California. The highest state average for monthly rents was in New York, $45, while the lowest average rent was in South Carolina, $12 (Table B2).

Differentials in cities of different size and on farms

Among the most striking differences in both residential values and rents are those that appear among cities of different size. Aside from exclusive residential suburbs where special restrictions and requirements make for expensive dwellings, housing becomes progressively less costly the smaller the town, reaching a minimum in rural areas. When the Census was taken at the beginning of 1930, before the industrial depression had proceeded far, the average value of all dwellings in cities of 100,000 or more population was $6,500. In cities of 10,000-25,000 in population values averaged somewhat more than $5,000. In towns less than 2,500 in population, residences were valued at an average of $2,700, or about 60 per cent less than in the largest cities. At the extreme lower end of the scale of residential values are farm dwellings. In 1930 they were valued on the average at $1,240, the country over, including the estimated value of one acre of land.

[4]Index number computed from *Changes in Cost of Living* (Bureau of Labor Statistics, December 15, 1938), p. 6.

TABLE 2

Regional Differences in Rents of Nonfarm Dwellings, 1930

	AVERAGE MONTHLY RENT IN DOLLARS	RELATIVE RENT
United States	30.34	100
New England	29.03	96
Middle Atlantic	39.66	131
East North Central	35.19	116
West North Central	25.60	84
South Atlantic	19.12	63
East South Central	15.69	52
West South Central	19.64	65
Mountain	21.94	72
Pacific	31.64	104

The extent of these differences on a national basis is most clearly evident from the relation of values in each group of cities to the average for all cities. If the average value of dwellings in all cities over 2,500 in population is taken as 100 per cent, the average value in cities of 100,000 or more in population was about 133 per cent, or one-third above the average. In contrast, the relative value of houses in towns of 2,500 or less in population was only 54 per cent of the average, and on farms only 24 per cent.

All parts of the country present the same general picture of lower residential values in small towns and on farms than in cities. In the Middle Atlantic and New England areas the highest average value on farms approximated $2,400, whereas dwellings in towns and cities averaged $4,900-$7,200 in 1930. In the South the regional low averages of $600-$900 contrast with urban averages of $2,700-$3,400.

Rented houses are usually valued at lower figures than those occupied by their owners. The value of owner-occupied dwellings in cities of 100,000 or more in population was $7,795 in 1930 as compared with $5,751 for rented houses. In towns of 2,500 or less in population the two values averaged $3,382 and $1,987. On the average for the United States as a whole, rented houses in small centers were relatively lower in value than those occupied by their owners. The latter dwellings were valued at 54 per cent of the 1930 national average; the tenant-occupied houses at 45 per cent.

The wider variation in values of rented than of owner-occupied dwellings is naturally paralleled by a correspondingly wide range of monthly rents, which averaged $40 in cities of

TABLE B2

Average Monthly Rent in Dollars, Occupied Nonfarm Rented Dwelling Units by Population Group, State, and Geographic Division 1930

	POPULATION GROUP						
	All groups	100,000 or more	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500
United States	30.34	40.07	31.52	26.88	23.45	20.29	14.10
New England	29.03	32.95	31.46	26.49	21.31	19. 0	19.01
Maine	20.53	.....	28.79	22.71	18.72	17.31	15.16
New Hampshire	19.78	.....	22.30	22.06	17.43	18.77	15.25
Vermont	19.39	.....	.....	26.58	22.19	20.98	14.48
Massachusetts	31.52	33.32	34.47	28.15	21.68	19.58	19.74
Rhode Island	26.15	29.62	26.40	19.77	18.16	22.75	15.75
Connecticut	30.20	33.31	31.19	28.38	26.49	20.65	24.65
Middle Atlantic	39.66	46.00	37.76	32.55	30.90	27.55	18.79
New York	45.26	48.73	36.67	31.16	37.75	29.19	23.39
New Jersey	38.20	38.49	42.61	40.68	36.31	31.94	24.58
Pennsylvania	29.26	38.17	33.33	29.66	26.04	25.19	15.12
East North Central	35.19	42.99	35.46	28.95	23.66	22.00	15.47
Ohio	31.03	35.42	36.72	27.14	23.83	23.60	16.41
Indiana	24.78	32.59	27.73	22.74	18.62	17.22	13.22
Illinois	41.30	48.59	38.70	31.92	26.49	21.98	15.15
Michigan	38.06	46.71	36.96	30.87	23.22	24.21	16.51
Wisconsin	30.78	40.27	32.32	32.49	23.59	21.91	15.56
West North Central	25.60	33.50	28.88	26.64	24.32	20.41	14.87
Minnesota	28.40	34.22	.....	28.09	23.55	22.57	16.29
Iowa	23.23	31.52	28.55	27.76	23.10	21.03	15.15
Missouri	28.10	34.39	28.04	25.43	25.69	17.52	13.73
North Dakota	23.52	.....	37.11	34.55	29.16	25.29	15.56
South Dakota	22.18	.....	32.99	30.02	22.33	25.20	16.19
Nebraska	24.26	32.27	31.61	26.83	24.26	20.74	15.75
Kansas	20.52	26.97	25.60	23.24	22.45	19.25	13.75
South Atlantic	19.12	32.41	22.24	18.91	18.49	15.05	10.49
Delaware	27.18	34.02	.....	.....	.....	19.81	17.26
Maryland	26.68	31.55	27.12	24.93	21.77	19.69	16.26
District of Columbia	45.19	45.19	.....	.....	.....	.....	.....
Virginia	18.91	28.05	20.47	22.94	20.00	16.59	11.37
West Virginia	16.46	.....	29.53	26.91	24.40	22.90	10.32
North Carolina	15.14	.....	23.09	16.17	16.29	14.41	9.67
South Carolina	11.94	.....	18.61	15.70	13.38	12.01	8.52
Georgia	15.40	26.53	17.49	15.66	13.87	11.38	9.44
Florida	18.42	25.26	23.46	19.62	23.47	14.76	10.44
East South Centra	15.69	23.46	22.19	1[illegible].00	15.29	13.62	9.43
Kentucky	17.48	26.41	25.13	18.14	17.50	15.49	9.98
Tennessee	17.31	22.84	22.39	17.69	14.86	13.44	9.75
Alabama	13.59	21.62	19.06	15.01	12.79	11.95	8.44
Mississippi	13.28	.....	20.43	15.72	15.22	13.87	9.92
West South Central	19.64	28.18	23.62	20.92	18.28	16.13	11.62
Arkansas	14.37	.....	22.99	19.91	16.34	13.83	9.75
Louisiana	18.88	25.53	24.46	16.84	14.88	13.26	10.31
Oklahoma	22.06	35.63	24.31	25.22	20.61	17.07	12.60
Texas	20.15	27.11	23.42	19.71	18.19	17.86	12.34
Mountain	21.94	30.97	29.91	28.03	23.23	21.46	14.45
Montana	22.47	.....	31.36	27.60	26.39	22.12	14.89
Idaho	19.01	.....	.....	28.33	23.90	21.24	13.91
Wyoming	21.04	.....	.....	28.44	26.35	25.52	16.16
Colorado	23.91	31.52	25.75	24.91	21.67	18.60	13.88
New Mexico	16.99	.....	29.88	25.47	21.75	20.15	11.96
Arizona	21.70	.....	33.61	.....	21.67	23.17	15.80
Utah	22.74	29.61	25.41	23.12	19.03	20.08	13.99
Nevada	23.98	.....	.....	41.07	27.14	26.39	16.19
Pacific	31.64	37.46	32.52	30.67	26.41	23.10	18.44
Washington	25.40	32.50	24.16	26.34	19.80	20.88	14.12
Oregon	23.56	30.74	25.52	28.46	23.74	20.03	13.75
California	33.77	38.87	33.22	32.37	27.39	24.45	21.06

SOURCE: *Residential Real Estate.*

100,000 or more in population in 1930, but only $14 in towns with fewer than 2,500 inhabitants (Table B2). Thus rents in large cities, the country over, were almost three times as high as those in small towns.

In certain parts of the country the contrast is even more marked than in the United States as a whole. In the cities of the South Atlantic States, for example, where the general level of rents is lower than in other parts of the country, the corresponding figures, for large cities and for small towns, were $32 and $10 per month. Expressed as relatives of the average for that particular region, rents in large cities were 170 per cent, and those in small towns, 55 per cent.

The extreme contrast in both rents and values is between large cities of the North and small towns in the Southern and Mountain States. Highest rents are paid in the Middle Atlantic States in cities of 100,000 or more in population, including New York City, where monthly rents averaged $46 in 1930. The lowest typical rents for any region are $9 in towns under 2,500 in population in the East South Central States, or approximately one-fifth of the rents paid in the large cities of New York, New Jersey, and Pennsylvania. The values and rents in small towns do not indicate the full extent of the difference, because the group of small towns includes many suburbs of large cities which are a part of the metropolitan areas having relatively high living costs. A careful segregation of small towns and villages that are not integral parts of large neighboring cities would show still lower residential values and rents (see Table 14 and footnote 5).

2 Other Differentials and Factors relating to Differentials

In Section 1 it is shown that large differentials in housing costs exist both among regions and among areas of varying population density. Other differentials and a limited group of the important factors related to them are now discussed. The precise importance of each factor and its relationships cannot be developed without further detailed study and explanation beyond the scope of this Bulletin.

Site value

A very important factor in differentials in the value of residential properties is the value of the land on which they stand. For new nonfarm properties, site values constitute more than 15 per cent of the total property value. For older properties, site value constitutes fully 20 per cent of total value, after allowance is made for depreciation of the structures. Of the mortgaged residential properties accepted for insurance by the Federal Housing Administration in 1937, the average value was $6,097, of which the land valuation after the site was improved was $921 or 15 per cent. The value of the site was highest both absolutely and relatively in the Middle Atlantic region, where site values averaged $1,154 or 17 per cent of property values. Land value was lowest in the Mountain States at an average of $539 or slightly over 10 per cent of average property value (Table 5).

Variations in the ratios of site value to total property value also exist in cities of different sizes and types. Although these variations are mild and somewhat irregular, data for new single-family dwellings securing mortgages for insurance by the Federal Housing Administration in 1937 show that land was a greater factor in the total cost of new houses in large cities than in small places, averaging from 13 to 18 per cent in cities above 50,000 in population and from 12 to 15 per cent in smaller towns (Table 6). Likewise land constitutes a smaller part of the property value in

Table 5

Average Value of Property and of Land Site, and Ratio of Site Value to Value of Property, New Single-family Houses securing Mortgages accepted for Insurance by the F.H.A., by Geographic Division, 1937[1]

	AVERAGE PROPERTY VALUE	AVERAGE LAND VALUE	LAND VALUE AS PERCENTAGE OF PROPERTY VALUE
United States	$6,097	$ 921	15.1
New England	6,409	833	13.0
Middle Atlantic	6,826	1,154	16.9
East North Central	7,038	1,021	14.5
West North Central	5,354	680	12.7
South Atlantic	5,652	842	14.9
East South Central	4,886	728	14.9
West South Central	4,834	744	15.4
Mountain	5,183	539	10.4
Pacific	5,637	896	15.9

[1]Computed by the National Bureau of Economic Research from data in the *Annual Report* of the Federal Housing Administration, year ending December 31, 1937, Table 33, p. 72.

Table 6

Average Value of Land as a Percentage of Average Value of Property, New Single-family Houses securing Mortgages accepted for Insurance by the F.H.A., by Population Group, within and outside Metropolitan Districts, 1937[1]

POPULATION GROUP	ALL NONFARM	WITHIN METROPOLITAN DISTRICTS	OUTSIDE METROPOLITAN DISTRICTS
Total	15.3	15.9	13.8
1,000,000 or more	16.9	16.9	....
500,000–999,999	17.8	17.8	....
250,000–499,999	15.6	15.6	....
100,000–249,999	13.9	13.9	....
50,000– 99,999	13.1	15.8	14.5
25,000– 49,999	12.2	16.6	13.5
10,000– 24,999	14.9	16.3	12.7
5,000– 9,999	15.4	16.8	13.2
2,500– 4,999	12.1	15.6	12.8
Less than 2,500	14.8	15.0	14.7

[1]Computed by the National Bureau from data in the *Annual Report* of the Federal Housing Administration, year ending December 31, 1937, Table 32, p. 71.

TABLE 7

Average Value of Farm Dwellings, including One Acre of Land, Value of One Acre of Land, and Ratio of Value of Land to Value of Property, by Geographic Division, 1930[1]

	Average Value of Property[2] (dollars)	Average Value of One Acre of Land (dollars)	Value of Acre of Land as Percentage of Value of Farm Dwelling, including Acre of Land (per cent)
United States	1,242	35	2.8
New England	2,356	31	1.3
Middle Atlantic	2,375	37	1.5
East North Central	1,750	26	1.5
West North Central	1,677	44	2.6
South Atlantic	876	30	3.4
East South Central	575	26	4.5
West South Central	670	26	3.9
Mountain	1,102	13	1.2
Pacific	1,820	68	3.7

[1] Derived from *Census*, 1930, IV, 60.
[2] Includes value of farm operator's dwelling and one acre of land.

TABLE 8

Average Value in Dollars of Owner-occupied and Rented[1] One-family Dwellings, by Materials of Construction and Geographic Division, January 1, 1934

	OWNER-OCCUPIED				RENTED			
	All Materials	Wood	Brick	Other	All Materials	Wood	Brick	Other
United States	4,283	3,693	9,298	6,360	3,142	2,798	5,880	3,508
New England	6,186	5,777	18,023	7,552	4,832	4,770	6,835	4,281
Middle Atlantic	5,409	5,074	10,254	6,557	4,459	4,204	5,506	4,681
East North Central	5,592	4,784	12,418	9,502	4,305	3,946	8,982	4,362
West North Central	3,663	3,129	7,690	4,674	2,713	2,461	4,930	3,144
South Atlantic	4,310	3,321	7,310	6,936	3,128	2,497	5,498	3,701
East South Central	3,240	2,760	7,257	6,959	2,567	2,284	6,282	3,298
West South Central	3,632	2,946	6,974	5,458	2,488	2,167	5,102	2,818
Mountain	2,946	2,056	3,619	3,484	2,466	1,731	2,842	2,560
Pacific	3,220	2,953	7,465	4,601	2,726	2,513	4,475	3,273

SOURCE: Weighted totals computed by the National Bureau of Economic Research from the *Financial Survey of Urban Housing*, 1934, for *Residential Real Estate*.
[1] Owner-occupied, 52 cities; rented, 44 cities.

cities outside metropolitan areas (14 per cent) than in cities within metropolitan areas (16 per cent).

In comparison with urban site values those for farm dwellings are relatively inexpensive, although the values can only be approximated. Ordinarily no specific measured area is assigned as the site and grounds for farm dwellings, and no valuation is given the site apart from the farm as a whole. Probably the building site of most farm dwellings would be valued above the average for an equal area of farm land. In Table 7, however, the dwelling site is assumed to be an acre in size, and its value is assumed to be the average value per acre for farm land in the region or state. When so estimated the value averages $35 for all

TABLE 9

Average Monthly Rent in Dollars per Dwelling Unit, by Type of Dwelling, Population Group, and Geographic Division, 1930

	POPULATION GROUP						
	All groups	100,000 or more	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500
	ONE-FAMILY DWELLINGS						
United States	24.15	34.01	29.91	26.17	22.93	19.92	14.04
New England	27.94	35.75	33.75	28.02	22.27	20.07	19.52
Middle Atlantic	31.43	40.55	37.80	32.94	31.20	27.75	18.94
East North Central	29.01	40.03	34.57	28.57	23.43	21.80	15.40
West North Central	22.56	30.82	27.49	25.52	23.44	19.97	14.72
South Atlantic	16.68	28.97	21.13	18.38	17.80	14.71	10.35
East South Central	14.62	21.77	21.08	15.53	14.86	13.27	9.26
West South Central	18.38	26.18	22.41	20.13	17.73	15.71	11.38
Mountain	20.41	28.40	28.56	26.79	22.65	20.99	14.30
Pacific	28.44	34.05	31.06	29.53	25.83	22.61	18.33
	TWO-FAMILY DWELLINGS						
United States	27.84	33.73	29.26	25.16	22.21	19.50	13.51
New England	27.20	30.38	29.35	24.66	19.82	18.26	17.96
Middle Atlantic	32.37	35.63	32.89	29.01	27.77	25.24	17.42
East North Central	33.77	37.62	32.84	27.44	22.96	21.59	15.40
West North Central	24.60	28.98	26.14	24.51	22.98	19.78	14.72
South Atlantic	19.20	28.13	20.70	18.19	17.80	14.84	10.56
East South Central	14.58	21.12	20.66	15.37	14.86	13.38	9.45
West South Central	17.89	25.39	21.96	19.92	17.73	15.86	11.61
Mountain	18.81	25.00	25.42	24.10	20.84	19.53	13.45
Pacific	26.56	29.96	27.65	26.59	23.76	21.04	17.22
	THREE-OR-MORE-FAMILY DWELLINGS						
United States	44.38	47.34	37.95	33.19	29.72	26.56	18.66
New England	31.71	33.58	31.77	26.40	20.95	18.78	18.42
Middle Atlantic	49.21	50.85	42.34	36.92	34.98	31.15	21.50
East North Central	46.71	48.40	41.81	34.48	28.36	26.28	18.70
West North Central	38.96	41.92	37.50	34.73	31.92	27.06	20.23
South Atlantic	36.81	43.54	31.62	27.54	26.96	21.75	15.49
East South Central	28.13	32.67	31.53	23.36	22.36	19.84	13.86
West South Central	33.41	39.14	33.59	30.05	26.65	23.63	17.22
Mountain	33.21	37.82	37.98	35.76	30.00	28.06	19.14
Pacific	43.68	45.34	41.31	39.32	34.63	30.30	24.44

SOURCE: *Residential Real Estate.*

farms in 1930, less than 3 per cent of the average total property value. The Pacific region was highest, with an indicated value of $68 for the dwelling site, or 3.7 per cent of the average total property value, and the Mountain States were lowest, with $13 or 1.2 per cent.

Materials used in construction

One of the chief differences in value of dwellings is that associated with the basic material of which they are built. The most obvious difference is that between wood and brick. A comparison of the values of one-family dwellings in 52 cities reported by the Financial Survey of Urban Housing showed an average for owner-occupied dwellings of $9,300 for brick and $3,700 for wooden structures (Table 8). Rented dwellings in 44 cities averaged $5,900 for brick and $2,800 for wood. The regional pattern for costs by kind of material is generally similar to the variations in cost for all dwellings, being highest in the North East and lowest in the West and South. An indeterminate part of these differences in values is due to such causes as differences in finish and size. For example, brick dwellings are usually larger than wood, and also have a higher value per room. In the sample the average values per room in brick and wooden buildings were respectively $1,230 and $600 for owned, and $900 and $500 for rented dwellings.

Type of structure

Although differentials between regions and between large and small cities characterize all types of dwellings, the type of the structure introduces an additional variation. In general, apartments rent for more than single-family houses, while two-family houses have the smallest rent of all in many regions but not in the country as a whole. In 1930 dwelling units in apartment structures rented at a monthly average of $44 for the country as a whole, two-family houses at about $28, and single-family properties at $24. There are several reasons for this relative scale of rents: (1) apartment buildings large enough to provide accommodations for many families are concentrated to a considerable degree in large cities in the northern and eastern states, where all properties are higher priced, with higher land values and higher construction costs; (2) a larger proportion of apartments than of single-family houses is of recent construction; (3) apartment buildings are more frequently made of brick or steel and concrete than of wood, usually a cheaper form of construction, and they have more elaborate central heating, plumbing, and other equipment.

The rents of apartments in multi-family dwellings that house three or more families in cities of 100,000 or more in population averaged $47 in 1930, in comparison with $19 in small towns of less than 2,500 in population. Rents of one-family houses ranged within narrower limits, from $34 in large cities to $14 in small towns (Table 9). This suggests a fair degree of similarity between the construction of one- and two-family houses. Similar differentials appear in the values of dwelling units of different type, values in large cities being generally higher than in small towns (Table 10).

TABLE 10

Average Value of Rented Nonfarm Dwelling Units by Type and Population Group, April 1, 1930

	POPULATION GROUP						
	All groups	100,000 and over	25,000–100,000	10,000–25,000	5,000–10,000	2,500–5,000	Under 2,500
All Types	4,347	5,751	4,416	3,832	3,347	2,882	1,987
1-family	3,596	5,101	4,475	3,940	3,409	2,924	2,048
2-family	3,693	4,539	3,849	3,316	2,913	2,537	1,663
3-or-more family	6,212	6,744	4,891	4,146	3,686	3,210	2,115

SOURCE: *Residential Real Estate.*

Facilities

Cost differences among dwelling types are accentuated by differences in the frequencies with which the types include facilities and conveniences as a part of the property. The Real Property Inventory showed a wide range in the percentage of dwellings possessing certain conveniences and facilities in different cities and in different parts of the country. For example, baths were provided in 88 per cent of four Pacific Coast cities and in 85 per cent of five Middle Atlantic cities, but in only 49 per cent of four East South Central cities. Since these accommodations are a part of the dwelling unit, they enter into the cost of construction and hence are reflected in the value of the property and in rents, especially in apartments.

Urban residences are notably better provided with facilities than those on farms. A survey of farm dwellings in 303 counties by the Bureau of Home Economics, in 1934 reported baths in 11 per cent, as compared with 76 per cent of urban residences in 64 cities as shown by the Federal Real Property Inventory (Table 11). The outlays for these additional accommodations often make substantial differences in the total values of the dwellings.

Closely allied to cost differences occasioned by additional construction expense for facilities are the apparent differences in rents arising from the cost of one or more facilities or services that may be either included or excluded in fixing the nominal charge. Where these differences in quotation practice are not taken into account, apparent differentials may appear to exist because of failure to recognize the actual cost of providing housing space as distinct from conveniences that may accompany the space. A summary of 51 cities covered by the Financial Survey showed that the charges most commonly included in rent were for water and garage. The percentages of dwellings having seven designated facilities are: Furnishings, 10.3; Electricity, 7.9; Gas, 6.2; Water, 57.9; Heat, 15.4; Mechanical Refrigeration, 7.2; Garage, 32.3.

The substantial nature of these charges for facilities is illustrated by data for 11 cities in the Financial Survey in which com-

	GROSS ANNUAL RENT (IN DOLLARS)	NET ANNUAL RENT FOR SPACE (IN DOLLARS)	COST OF FACILITIES AS PERCENTAGE OF: GROSS RENT	COST OF FACILITIES AS PERCENTAGE OF: NET RENT FOR SPACE
One-family dwellings	257	234	8.9	9.9
Two-family dwellings	238	210	11.4	12.9
Apartments	330	249	24.7	33.9

parisons are made among the principal dwelling types. About 9 per cent of the gross rent of one-family dwellings was a charge for facilities, and about 25 per cent of the gross rent of apartments.

Community services and improvements

Streets, paved walks, drainage systems, and other public improvements are provided in varying degrees in large and small centers. Their costs also vary. Large cities have paved streets and

TABLE II

Percentage of City and Farm Dwellings having various Facilities, 64 Real Property Inventory Cities and Farm Dwellings in 303 Counties, by Geographic Division, 1934

	BATHS[3]	INDOOR WATER CLOSETS	MECHANICAL REFRIGERATION	LIGHTING: Gas	LIGHTING: Electricity	COOKING: Gas	COOKING: Electricity	CENTRAL HEATING SYSTEM	RUNNING WATER[4]: Total	RUNNING WATER[4]: Hot and Cold
Total										
64 Real Property Inventory Cities	76.5	82.7	17.0	0.2	90.6	69.4	3.9	50.5	91.9	66.9
303 Counties Farm Housing Survey	11.2	8.5	2.4	1.1	17.8	2.3	1.9	8.6	24.1	7.7
New England										
6 Real Property Inventory Cities	79.8	91.3	12.2	0.3	96.7	72.8	1.1	49.3	97.3	53.5
13 Counties Farm Housing Survey	29.9	29.4	10.6	0.3	57.5	1.9	3.6	29.9	81.5	26.3
Middle Atlantic										
5 Real Property Inventory Cities	85.5	91.5	14.7	0.3	96.3	87.2	0.4	76.8	97.2	81.3
2 Counties Farm Housing Survey[1]	41.9	37.5	15.6	1.3	68.9	11.0	5.1	52.2	92.7	38.7
East North Central										
8 Real Property Inventory Cities	81.0	88.0	17.1	0.2	96.0	86.6	0.5	71.7	93.4	77.3
42 Counties Farm Housing Survey	13.5	10.3	2.3	2.6	26.7	4.5	2.6	23.4	26.9	8.8
West North Central										
10 Real Property Inventory Cities	78.0	82.7	19.8	0.2	95.6	82.0	1.3	69.2	90.9	69.6
60 Counties Farm Housing Survey	12.8	8.8	2.3	0.7	18.1	1.9	1.0	17.0	23.8	8.0
South Atlantic										
11 Real Property Inventory Cities	63.3	70.0	17.7	0.4	75.4	49.9	3.2	31.6	85.5	46.1
56 Counties Farm Housing Survey	5.5	4.9	1.8	1.0	10.4	1.4	0.8	1.5	12.9	4.0
East South Central										
4 Real Property Inventory Cities	48.8	63.2	10.7	0 1	66.8	32.6	1.1	17.5	83.4	32.5
34 Counties Farm Housing Survey	3.0	2.5	1.1	0.3	5.0	0.4	0.3	1.0	6.3	2.2
West South Central										
7 Real Property Inventory Cities	71.6	73.9	17.2	0.3	81.4	78.7	0.3	3.8	85.1	61.6
44 Counties Farm Housing Survey	7.3	3.6	1.6	0.8	6.6	1.7	0.6	0.3	14.8	1.7
Mountain										
9 Real Property Inventory Cities	76.6	79.3	19.0	....[2]	94.5	40.7	13.8	37.8	92.5	76.3
33 Counties Farm Housing Survey	15.3	11.9	3.9	0.3	27.9	1.8	5.1	4.8	40.0	13.2
Pacific										
4 Real Property Inventory Cities	88.1	89.8	20.1	0.1	97.7	54.5	17.4	48.1	97.2	87.0
19 Counties Farm Housing Survey	51.0	41.5	8.5	2.0	73.0	9.6	15.0	5.7	115.6	45.7

SOURCE: *Federal Real Property Inventory*, 1934, U. S. Department of Commerce; *Farm Housing Survey*, 1934, Bureau of Home Economics, U. S. Department of Agriculture, 1939.

[1]Middle Atlantic represented by 2 counties only in New Jersey.

[2]Less than one-tenth of one per cent.

[3]Installed bathtubs and separate showers not built over bathtubs.

[4]Running water inside a residential unit; the percentage of units having cold water alone may be obtained by subtracting the percentage having both hot and cold from the total.

walks, while small towns frequently have gravel streets or no surfacing and less expensive sidewalks. These services and improvements provided through public taxation or special property assessments usually enhance the value of properties in larger and richer communities more than in smaller towns. Although it is evident that public improvements vary with the size of the city, little or no quantitative information with which to measure the effects of these improvements on housing costs is available.

Age of structures

One of the most important factors responsible for the differences in cost at which housing may be purchased or rented is the age of the structure. Houses similar in size but of different ages represent different levels of current value. Though a structure 20, 30, or more years old is still useful as a dwelling, its value because of style, location, or need for repairs is materially less than when first built. In 22 of the cities covered in the Financial Survey of Urban Housing in early 1934, new dwellings of all types built in the four years 1930-33 were currently valued at 40 per cent more than those built in 1890-99, and nearly 20 per cent more than those built in the 1920's, when construction costs were much higher than in the depression years of the early 1930's (Table 12). The contrast would be even greater if costs of buildings constructed in 1939 were compared with average values of all houses now standing.

TABLE 12

Ages and Values of Houses, 22 Cities, January, 1934

DATE OF CONSTRUCTION	AVERAGE VALUE (IN DOLLARS)	INDEX OF VALUES (1930–33 = 100)
1930–1933 (4 years)	5,656	100
1920–1929	4,781	85
1910–1919	4,152	73
1900–1909	3,559	63
1890–1899	3,288	58

SOURCE: *Financial Survey of Urban Housing*, 1934.
Average values are unweighted and include 75,831 houses, both owner-occupied and rented, in 22 cities.

The age distribution of houses varies from city to city and is in itself a major factor in city and regional differentials. The Financial Survey in Syracuse, N. Y., for example, found that about 70 per cent of the structures existing in 1934 were built before 1920, while in San Diego, California, only 39 per cent were built before 1920.

Availability of financing

A part of the difference in the values of houses in various localities is due to the relative availability of credit. In general, financing facilities are best in cities and poorest in small towns and for dwellings on farms. Cities commonly have specialized institutions for making loans on residential property. The existence of more properties in a homogeneous area and within easy access of the lender is conducive to the development of financing facilities designed to provide maximum convenience to the prospective builder or purchaser. The financing machinery so established may be used to make loans which are larger in amount, and are offered at lower rates, for longer terms, and with more favorable amortization than is possible where these conditions do not exist. The borrower who has ready access to credit can buy or construct a given dwelling by the payment of a smaller amount for interest and principal, or command a better property with the same amount of funds. In such circumstances there is usually a tendency on the part of the prospective home-owner or landlord to build or buy houses costing the maximum value that may be carried with the means available. Thus lower interest rates and more favorable terms are conducive to more expensive houses.

Houses on farms are the least favorably situated with respect to the securing of financing. The dwelling is usually part of the farm property and is occupied by a family connected with the farm's operation. Usually the value of the dwelling is less than the value of the farming land. The entire property, rather than the dwelling alone, constitutes the unit to be exchanged and financed, and in most such transactions the dwelling is a minor item in the value of the whole enterprise. This fact makes the farm dwelling less desirable, if not totally unacceptable, as security for a loan.

Construction costs

Most of the factors responsible for differentials in housing costs enter also into the cost of new construction; and the data on the cost of new dwellings show differentials similar to those existing for old houses. For example, the average cost per dwelling unit for 33 Public Works Administration projects completed between 1934 and 1938 in 26 cities is shown in Table 13 to have been $4,472 for 16 northern projects and $3,568 for 17 southern projects. This difference of about one-third reflects the more solid construction and the higher average standard of housing common in the colder parts of the country.

More detailed evidence of differentials is found in reports on building permits made to the Bureau of Labor Statistics. A special tabulation for 1937 by regions and size of city indicates that the Middle Atlantic states usually have the highest average for building permits and the East and West South Central the lowest (Table 14).[5] Also the average tends to vary directly with the size of the city.

[5]Data in Table 14 are presented separately for satellite cities, that is, those adjacent to and essentially dominated by a large metropolitan district, and non-metropolitan district cities in order to show that for cities of the same size, the type of community must be taken into consideration. Satellite cities (for discussion of such cities see *Bulletin* 65, Nonfarm Residential Construction, 1920-1936, David L. Wickens and Ray R. Foster) definitely tend toward higher average values, marked differences appearing in every region and in almost every group of cities.

TABLE 13

Average Cost per Dwelling Unit in Dollars, 33 Completed Public Works Administration Projects in 26 Cities, 1934-1938, by City, Geographic Division, Northern and Southern Groups, and by Race or Color of Occupants[1]

	DWELLING UNITS							
	White		Negro		White and Negro		Total	
	Number[2]	Average cost[3]	Number[2]	Average cost[3]	Number[2]	Average cost[3]	Number[2]	Average cost[3]
2 *New England Cities*	442	$4,488					442	$4,488
Cambridge, Mass.	294	4,452					294	4,452
Stamford, Conn.	148	4,559					148	4,559
5 *Middle Atlantic Cities*	2,592	5,291	912	$4,431			3,504	5,067
Buffalo, N. Y.	660	5,640					660	5,640
New York City, N. Y.	1,674	5,014	583	4,665			2,257	4,924
Atlantic City, N. J.			277	3,900			277	3,900
Philadelphia, Pa.	258	6,195					258	6,195
Wayne, Pa.			52	4,632			52	4,632
5 *East North Central Cities*	3,185	4,267	1,593	3,561			4,778	4,032
Cleveland, O.	654	3,380						
	620	4,210	579	3,811			1,853	3,792
Toledo, O.			266	4,732			266	4,732
Indianapolis, Ind.			748	2,951			748	2,951
Chicago, Ill.	925	4,758						
	468	5,195					1,393	4,905
Milwaukee, Wis.	518	3,739					518	3,739
16 *Northern Projects*	6,219	4,709	2,505	3,878			8,724	4,472
5 *South Atlantic Cities*	604	2,688	1,135	2,690	336	$4,598	2,075	2,998
Charleston, S. C.					214	4,922	214	4,922
Columbia, S. C.					122	4,031	122	4,031
Atlanta, Ga.	604	2,688	675	2,487			1,279	2,582
Jacksonville, Fla.			217	3,000			217	3,000
Miami, Fla.			243	2,977			243	2,977
6 *East South Central Cities*	1,076	4,456	1,338	3,224	287	4,530	2,701	3,854
Lexington, Ky.					287	4,530	287	4,530
Louisville, Ky.	213	4,498					213	4,498
Memphis, Tenn.	449	4,847	636	3,734			1,085	4,195
Nashville, Tenn.	314	4,354					314	4,354
Birmingham, Ala.			544	2,913			544	2,913
Montgomery, Ala.	100	2,934	158	2,245			258	2,512
3 *West South Central Cities*	622	4,226					622	4,226
Enid, Okla.	82	4,677					82	4,677
Oklahoma City, Okla.	358	4,221					358	4,221
Dallas, Tex.	182	4,032					182	4,032
17 *Southern Projects*	2,302	3,930	2,473	2,979	623	4,567	5,398	3,568
33 *Projects*	8,521	4,499	4,978	3,431	623	4,567	14,122	4,126

[1] SOURCE: Primary Data for Individual Projects, Bureau of Labor Statistics, Division of Construction and Public Employment (mimeographed release) 'Pertinent Facts Concerning Construction of 33 Federal Low-Cost Housing Projects Financed from P. W. A. Funds' (subject to revision), May 2, 1938. City and divisional averages computed by the National Bureau of Economic Research and weighted by number of dwelling units.

[2] Social and recreational units contained in space that might have been utilized for dwelling units have been considered as dwelling units.

[3] Based on cost of dwelling units without facilities rather than construction contract price.

TABLE 14

Average Value of Building Permits for Housekeeping Dwelling Units, Satellite Cities and Non-Metropolitan Districts, by Population Group and Geographic Division, 1937

	POPULATION GROUP					
	100,000 and over	50,000–100,000	25,000–50,000	10,000–25,000	5,000–10,000	2,500–5,000
	SATELLITE					
United States	3,868	5,469	4,940	5,458	5,248	5,204
New England	3,454	7,065	5,349	5,590	4,772	5,109
Middle Atlantic	5,813	5,496	7,524	5,908	5,905	5,099
East North Central	4,372	5,763	4,363	7,438	6,923	7,213
West North Central			4,827	3,756	4,098	3,960
South Atlantic			3,057	4,703	6,115	3,655
East South Central			2,408	5,899	3,058	
West South Central				1,680	5,401	4,255
Mountain					1,644	
Pacific	2,966	4,407	3,442	3,948	3,437	4,383
	NON-METROPOLITAN DISTRICT					
United States		3,123	3,478	2,702	2,515	2,504
New England		3,658	7,192	3,389	3,901	3,350
Middle Atlantic		4,789	4,927	4,277	3,568	5,448
East North Central		3,734	3,793	3,100	3,498	3,983
West North Central		3,220	2,821	3,063	2,872	3,156
South Atlantic		3,082	3,110	2,409	2,814	2,382
East South Central		2,848	2,064	1,737	1,869	2,145
West South Central		2,616	3,091	2,072	1,920	1,677
Mountain		2,288	3,152	3,171	2,056	1,766
Pacific		4,453	3,216	2,621	2,514	2,005

SOURCE: Computed from unpublished Number of Dwelling Units Provided and Permit Valuation data from the U. S. Bureau of Labor Statistics.

In addition to being influenced by the same factors that affect housing costs, new construction costs reflect differences in costs of materials and labor. Proximity to the source of materials probably accounts for part of the lower building costs in small centers and on farms, as well as in the Pacific Northwest and parts of the South where the source of lumber is nearby. Rural areas are also less likely to have or to use the most expensive materials. Moreover, in areas where brick or stone construction predominates material costs are usually higher than in areas where simple frame dwellings suffice.

Variations in labor costs are of considerable importance in accounting for differentials in new construction costs. In large cities labor costs of nearly all building trades are commonly much higher than in small centers or on farms. Comparisons of wage rates in Cleveland and in the adjoining counties extending outward for 100 miles indicate that they vary with the degree of organization of labor (Table 15).[6] If the lower rates in the smaller towns imply less specialization and less technical skill they would probably affect the quality of structures and consequently their value.

[6]These comparisons may be affected by differences in details of building in large and small localities.

Another set of reports indicating the effects of differences in labor and material costs, particularly regional differences, is provided by the Federal Home Loan Bank Board's estimates of the cost of building the same standard house in representative cities. These reports indicate the same general differences among cities in various parts of the country as those shown in this Bulletin with the exception of some of the cities in the Mountain states, where values and rents of existing dwellings are relatively low but new construction is relatively costly because of special local conditions. Cities in the Middle Atlantic states report high costs, averaging $5,829 for 10 cities, and nearly $6,100 for 22 North Central cities. Southern cities show the lowest cost with an average of $5,400 for 15 South Atlantic cities and $5,600 for 5 East South Central cities. As is to be expected, the differentials are less marked for a new house of standard specifications than for existing dwellings, which reflect wide local variations in standards of living.[7]

TABLE 15

Hourly Wage Rates for Carpenters, Bricklayers, and for All Occupations in the Construction Industry, in Cleveland, Ohio, and in Four Counties South of Cleveland, 1936[1]

		COUNTY			
	CLEVELAND	MEDINA	WAYNE	HOLMES	COSHOCTON
DISTANCE FROM CLEVELAND (MILES)	0	15–35	35–55	55–70	70–90
		(DOLLARS PER HOUR)			
Carpenters					
Union	1.25	1.00	0.80		0.85
Non-Union	0.75	0.63	0.59	0.48	0.60
Bricklayers					
Union	1.37	1.25	1.25	1.25	1.25
Non-Union		0.93	0.80		0.82
All occupations					
Union	1.13	0.97	1.12	....[2]	0.83
Non-Union	0.66	0.64	0.59	0.50	0.61

[1]From unpublished data collected by the U. S. Bureau of Labor Statistics.

[2]Data given for bricklayers alone.

[7]Data for the 79 cities for which costs are estimated by the Federal Home Loan Bank Board are published in the Federal Home Loan Bank Review. The house on which costs are reported is a detached 6-room home of 24,000 cubic feet volume, principally of frame construction, with garage, unfinished cellar and attic, fireplace, heating, plumbing, and electric wiring. Reported costs include compensation insurance, contractor's overhead, transportation of materials, and 10 per cent builder's profit. Costs do not include land, planting, walks, driveways, architects' fees, building permit, financing charges, or sales costs.

Income levels

The amount spent on housing is usually related to income, although within income groups there are wide variations. Farm dwellings on the average are valued below urban partly because the money income available to farm families for living averages less than that for urban. Similarly differentials in housing costs between North and South are closely connected with income and wage differences in the two areas.

A striking example of the effect of income levels on housing costs is the use of less costly housing by certain population groups whose income levels are notoriously low. For example, a large part of the southern differential in housing costs is a reflection of the greater number of negro families in the South. Further evidence of the influence of different sizes of income is shown in the wide difference between costs of newly constructed dwellings provided for white and negro families (Table 13). In every city for which data are available, the average cost of negro dwelling units constructed by the Works Progress Administration is lower than that of dwelling units for white families. The average cost of 8,500 units built for white families was $4,500; that of 5,000 units built for colored families, $3,400. Although a part of this difference was due to the greater number of colored families in the South where all construction costs less, the tendency for new construction to be influenced by the standard customary in the area or for the group is evident when costs within the same areas are compared. White dwelling units on the northern project cost $4,700 and negro units $3,900. A similar difference appeared on the southern projects where white units averaged $3,900 in cost and negro units about $3,000.

Cost of living

Since housing constitutes a substantial item in family budgets—at the lower income levels 15 to 25 per cent of total expenditures—housing differentials are pertinent in cost of living studies. These differentials may also be treated as a function of variations in the cost of living. The consistency of the relationship between housing cost and total expenditures for living is indicated by the study of intercity differences in the cost of living by the Works Progress Administration, 1933.[8] In 59 cities, with the total cost of living varying from $1,130 in Mobile, Alabama, to $1,415 in Washington, D. C., housing cost, including water, ranged from $158 in Portland, Oregon, to $342 in Washington, D. C. The average percentages of housing cost to total cost of living in the same group of cities ranged from 13 in Portland, Oregon, to 24 in Washington, D. C.

Examination of the data shows that some cities rank high in total cost of living but low in housing cost, and vice versa. For example, New Orleans ranks first in cost of living among 6 West South Central cities but fourth in housing cost; while Peoria, Illinois, ranks sixth and first respectively among 8 East North Central cities. If housing cost is correlated with cost of living excluding housing cost for all 59 cities, the coefficient of rank correlation is only .46. Further analysis, and perhaps better cost of living studies, are of course required before the full significance of such measures can be determined. Here it is possible to do little more than suggest that housing differentials are less closely associated with differences in other living costs than might be expected.

The existence of differentials is a pertinent fact in the planning of measures designed to provide adequate housing. If government subsidies are to be provided, satisfactory regional allocation of federal funds cannot be made without knowledge of regional differentials. Nor can long range housing programs, private or public, be set up without more complete analysis of such factors as the economic resources available to meet and sustain the costs of housing and more complete knowledge of where housing improvements are most needed.

[8] *Intercity Differences in Costs of Living* (Works Progress Administration, March 1935), Appendix Table 2.

3 Sources of Data and Methods

The principal source of the material presented in this Bulletin is the forthcoming book, *Residential Real Estate*. In fact, since Tables A3 and B2 are taken from it the numbering is retained; and since the methods used will be there set forth in detail they are summarized only briefly here.

The 1930 Census of Population provided data on the number of families by rent and value groups. These data were supplemented by estimates of vacant dwelling units and units unreported. A special tabulation of the data for 139 representative towns and cities gave information concerning average values and rents, by groups. The estimate of aggregate rents, by type of dwelling, was converted into estimated total value of rented property by use of Financial Survey of Urban Housing data showing the relation between rents and values, as reported by tenants and landlords for the same classes of properties. From total values and rents were derived average values and rents for each population group, by geographic divisions and states. The primary data on costs of new construction were obtained by the Bureau of Labor Statistics. Appreciation is expressed to Herman Byer of that Bureau for use of special tabulations. Values of farm dwellings and farm land were derived from the 1930 Census of Agriculture through computations by the National Bureau of Economic Research. Grateful acknowledgment is made to Ray R. Foster who assisted in preparing the basic material, to Melvin F. Miller who made most of the computations, and to W. H. Shaw for assistance to the staff advisory committee.

As did *Bulletin 65*, this Bulletin presents some results of the major study, Real Estate Financing and Economic Stability, which was initiated at the request of the Social Science Research Council (Committee on Credit and Banking, Division of Industry and Trade) and has been carried on, with its support, by the National Bureau. The manuscript on *Residential Real Estate* is being circulated among the Directors of the National Bureau and will be sent to the printer upon their approval. The publication date and price will be announced later.

Differentials in Housing Costs

THE BULLETIN

The next issue of the Bulletin, now in press, will be a statistical study of the Pattern of Consumer Instalment Debt, by Ralph A. Young and Blanche Bernstein. With 22 tables and 9 charts it is so large that it will be given two numbers, 76-77. Presenting findings developed from a study of the use of instalment credit for the purchases of commodities it is the first of a series of Bulletins and books giving results of the first project, initiated in 1938, under the program of research in finance supported by special grants from the Association of Reserve City Bankers and the Rockefeller Foundation. Two books, *Personal Finance Companies and their Credit Standards*, and *Sales Finance Companies and their Credit Standards*, are well along toward the publication stage. The first has been approved by the Directors of the National Bureau and will soon be sent to press; the second is being read by the staff advisory committee. A third, *Government Agencies of Consumer Instalment Credit:* the Federal Housing Administration and the Electric Home and Farm Authority, is about to be submitted to the staff advisory committee. Titles of other studies including one on commercial banking and consumer financing and one on consumer financing and economic fluctuations, will be announced later.

Bulletin 76-77 is based on data obtained from the Study of Consumer Purchases, a Works Progress Administration project conducted by the United States Bureau of Home Economics and the United States Bureau of Labor Statistics in cooperation with the National Resources Committee and the Central Statistical Board.

RESEARCH ASSOCIATES, 1939-1940

Funds appropriated by the Carnegie Corporation for grants-in-aid have made possible the appointment of three new research associates: George H. Evans, Jr., of Johns Hopkins University; Geoffrey H. Moore of Rutgers University, and Allen W. Wallis of Stanford University. The term of Moses Abramovitz of Harvard University has been prolonged one year. Joel Dean of Indiana University, who has been Executive Secretary of the Conference on Price Research and is writing a Bulletin on Cost Behavior in a Manufacturing Enterprise (a Statistical Analysis), will join the faculty of the University of Chicago this autumn.

OFFICERS

GEORGE SOULE, *Chairman*
DAVID FRIDAY, *President*
W. L. CRUM, *Vice-President*
SHEPARD MORGAN, *Treasurer*
W. J. CARSON, *Executive Director*
MARTHA ANDERSON, *Editor*

DIRECTORS AT LARGE

C. I. BARNARD, *President, New Jersey Bell Telephone Company*
H. S. DENNISON, *Dennison Manufacturing Company*
G. M. HARRISON, *Pres., Brotherhood of Railway and Steamship Clerks*
O. W. KNAUTH, *President, Associated Dry Goods Corporation*
H. W. LAIDLER, *Executive Director, League for Industrial Democracy*
L. C. MARSHALL, *The American University*
GEORGE O. MAY, *Price, Waterhouse and Company*
SHEPARD MORGAN, *Vice-President, Chase National Bank*
G. E. ROBERTS, *Economic Adviser, National City Bank*
BEARDSLEY RUML, *Treasurer, R. H. Macy and Company*
GEORGE SOULE, *Director, The Labor Bureau, Inc.*
N. I. STONE, *Consulting Economist*

DIRECTORS BY UNIVERSITY APPOINTMENT

W. L. CRUM, *Harvard*
E. E. DAY, *Cornell*
GUY STANTON FORD, *Minnesota*
F. P. GRAHAM, *North Carolina*
H. M. GROVES, *Wisconsin*
W. H. HAMILTON, *Yale*
H. A. MILLIS, *Chicago*
WESLEY C. MITCHELL, *Columbia*
A. H. WILLIAMS, *Pennsylvania*

DIRECTORS APPOINTED BY OTHER ORGANIZATIONS

F. M. FEIKER, *American Engineering Council*
DAVID FRIDAY, *American Economic Association*
LEE GALLOWAY, *American Management Association*
MALCOLM MUIR, *National Publishers Association*
W. W. RIEFLER, *American Statistical Association*
MATTHEW WOLL, *American Federation of Labor*

RESEARCH STAFF

WESLEY C. MITCHELL, *Director*

A. F. BURNS
SOLOMON FABRICANT
MILTON FRIEDMAN
SIMON KUZNETS
F. R. MACAULAY
F. C. MILLS
D. L. WICKENS
LEO WOLMAN
R. A. YOUNG
EUGEN ALTSCHUL, *Associate*

NATIONAL BUREAU OF ECONOMIC RESEARCH BULLETINS

Annual Subscription (5 issues), $1; single copies, 25 cents

CHECKED
BCC