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STUDIES IN

Income and Wealth

VOLUME THREE

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(Resolution of October 25, 1926, revised February 6, 1933)

STUDIES IN

Income and Wealth

VOLUME THREE

BY THE CONFERENCE ON RESEARCH
IN NATIONAL INCOME AND WEALTH

NATIONAL BUREAU OF ECONOMIC RESEARCH

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PREFACE

THIS third volume of the series, *Studies in Income and Wealth*, is in significant contrast to the preceding two. Every paper in this volume is concerned with problems centering about the division of a national total—of either wealth or income—into meaningful constituents. The first three papers—by C. L. Merwin, Jr., Charles Stewart, and Enid Baird and Selma Fine—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, by R. W. Goldsmith, is an attempt to estimate the portion of total income that is saved rather than used to purchase goods currently consumed. Clark Warburton's paper 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. R. R. Nathan considers the problems involved in allocating the total income of the nation among political units, the states, and P. H. Wueller, the usefulness of such an allocation for the purpose of measuring relative capacities of the states as a guide in distributing federal grants.

The papers in *Volumes One* and *Two*, on the other hand, were devoted primarily to problems centering about the meaning and measurement of total national wealth and income. None took as its specific and main problem the allocation of a total among its constituent elements, although all the papers reiterate the need for breakdowns of the totals and clearly recognize that the possibility of evaluating the components is largely responsible for the usefulness of the estimates of the totals. But even those papers and comments that deal almost exclusively with segments of the totals—for example, the series of papers on income de-

rived from government or the discussion of measuring inventory gains or losses—were concerned with these segments not primarily because they were important in their own right but rather because they presented baffling problems of estimation that needed to be solved to improve the adequacy of the totals.

This shift in emphasis is both understandable and desirable. The preceding volumes have by no means reconciled the divergent opinions concerning the constitution of national income, or of that as yet little quantified total, national wealth, and the probability that further discussion of these points in later volumes will be needed is fully recognized. But they have served the function of laying bare the nature of and reasons for the divergencies, of setting forth the border areas where disagreement is sharp, and of making explicit the assumptions concerning them. We can now formulate, as we could not so clearly before, three major questions about the constitution and measurement of national income on which there is a fundamental division of opinion: first, whether capital gains and losses should be included in the income total; second, whether the net value product of illegal enterprises should be included in the income total; third, how the services rendered by government should be valued.

Capital gains and losses reflect changes in the value of assets on hand at the beginning of the year that arise from unanticipated changes in their quantity or quality. Such alterations in the valuation of assets may result from price changes alone, or from actual physical changes in durable goods (for example, through fire losses) or from changes in our knowledge of them (for example, through discovery of mineral resources). Quantitatively, capital gains and losses due purely to price changes are much the most important aspect of the problem; consequently, this summary is restricted to gains and losses of this type. Divergent views as to whether they should be included in national income have probably been responsible for wider discrepancies between estimates of year-to-year variation in national income than have divergent views on any other class of items. Three positions as to the proper treatment of such capital gains and losses have been held. One position is that they should be excluded from income in both 'current' and 'constant' prices; a

second, that they should be included in income in current prices but should be eliminated when income is adjusted for price changes; and the third, that income in both current and constant prices should include capital gains and losses, in whole or in part.

The disagreement with respect to income in current prices hinges on a difference of opinion as to which concept is most useful. Those who favor the exclusion of capital gains and losses think that national income in current prices will be most useful if it is a measure of the value of a flow of commodities and services rather than a measure of the flow of monetary values. They would define national income in current prices as the current value of the goods and services consumed plus the current *value of the change* in the community's stock of capital and thus would exclude both realized and unrealized capital gains and losses arising from price changes. Some of those who hold the opposing view argue, on the other hand, that national income in current prices has primarily a monetary significance—that logically it should be defined as equal to the 'values' consumed by or accrued to the credit of the individuals constituting the community. This would mean that national income would be defined as equal to the value of the goods and services consumed plus the *change in the value* of the community's stock of capital and thus would include both realized and unrealized capital gains and losses. Others support the same position for somewhat different reasons. Although granting that capital gains and losses do not add to the total value of the flow of commodities and services during a period, they maintain that such gains and losses do affect the share of the total to which component groups in the community can lay claim, and hence should be included at least when problems dealing with the distribution of national income are considered.

The practical aspect of the question, namely, whether capital gains and losses can be objectively measured, though outstandingly important, does not contribute unambiguously to a solution. Some types of capital gains and losses, such as those arising in connection with real estate and investments, are to a considerable extent separable in the accounting data used for income estimates; their inclusion in national income means adding

items, the measurements of which may be inaccurate. However, other types of capital gains and losses, such as those arising in connection with inventories, are included in the raw data on which income estimates rest and can be eliminated only by subtracting estimates of them from a presumably more nearly accurate total.

The disagreement with respect to income in constant prices arises from divergent views as to the price changes for which correction should be made. One view is that 'income in constant prices' should be defined as equivalent to an index of the physical volume of commodities and services produced. This would require correction for changes in specific prices that would of necessity eliminate all capital gains and losses, at least in a closed economy. Deflation by a general price index is then merely an indirect method of approximating an index of physical volume, and any failure thereby to eliminate capital gains and losses is to be counted an error. The other view is that it is desirable to correct solely for changes in the 'general level of prices' or in 'purchasing power', but not for changes in specific prices. According to this view, deflation by a general price index yields, conceptually, the desired figure and not an approximation; failure thereby to eliminate all capital gains and losses is considered a correct and proper result. All parties to the controversy agree on the importance of measuring capital gains and losses; the division of opinion is on the advisability of including the resultant estimate in the national income total.

A second major issue in connection with the definition of total national income is whether to include the net value product of illegal enterprises. Those who would include activities such as bootlegging during the prohibition era urge as a principal reason for so doing that inclusion only of legal items would invalidate comparisons of income estimates for periods during which the legal status of any important type of activity has changed. They note also that illegal enterprises employ tangible national wealth and human labor as legal enterprises do and that the net-value-product formula is equally applicable to their accounts. Those who advocate the exclusion of the products of illegal enterprises have urged that the line between legal and illegal enterprises represents the judgment of the community as to which enter-

prises are economically productive and that if national income is to be defined in terms of an objective distinction between economically 'productive' enterprises and others, the legality basis is the most satisfactory one for making such a distinction. A second point made against the inclusion of illicit activity is the unreliability of the accounting data that pertain to it.

The valuation of the share of national income derived from government is a third issue on which there is fundamental disagreement. This issue can be conveniently considered in terms of the two main constituent items of the gross-value-product of government: (1) the value of services to ultimate consumers and to other enterprises and (2) the value of additions to the tangible assets of government. The treatment of the latter item is not in dispute; it is agreed that it should be valued in the same way as additions to the assets of non-government enterprises, namely, on the basis of cost, or outlays. Disagreement on the valuation of current services arises because these services are, in the main, not 'sold' on the market for a 'price' but are made available without specific payment. Yet they clearly contribute to national income.

It has been urged, on the one hand, that total tax receipts are the closest analogue to the revenue from sales of a business enterprise and that tax receipts should, therefore, be taken as representing the value of such services. On the other hand, those who object to this view would substitute an imputed value for government services. Whether tax receipts or an imputed valuation of government services is used to determine the gross-value-product of government, there is general agreement that to obtain the corresponding net value product it is necessary to subtract payments to non-government enterprises for products used in producing the current services.

Proponents of the 'tax receipts' basis argue that net income originating in the private sector of the economy is typically measured by receipts minus payments to other industries for goods currently consumed and that consistency requires that current government services be measured in similar fashion. They grant that even in dealing with the private sector of the economy there are items, other than additions to the assets of enterprises, that cannot be valued on the basis of actual receipts,

notably farm products consumed on farms and net rental value of houses occupied by their owners. These, however, may be valued at prices at which comparable items are actually sold; but this method is not considered practicable for most government services because closely comparable services are rarely sold on the market.

Proponents of an imputed valuation for government services frequently rely upon an estimate of the cost of or outlays upon such services to obtain an imputed value. They urge in favor of such a procedure as a substitute for tax receipts that tax receipts are a mere money flow, the year-to-year changes which have no necessary relation to year-to-year changes in the value of government services. They further urge that if year-to-year (or month-to-month) comparisons of government net-value-product are to be made, an imputed valuation is necessary if misleading results are to be avoided.

Whichever view is accepted, there remain five important questions regarding income derived from government that have caused a good deal of discussion. The first three have to do with the distributive shares into which the net-value-product of government can be divided. (1) Are such payments as those to relief-work employees properly distributive shares or are they really to be classed with direct-relief payments as redistributions of income? (2) What part, if any, of government-interest payments belongs to the primary distribution of income, and what part represents a redistribution of income? (3) What distributive share for government, if any, corresponds to additions to or withdrawals from surplus for corporations? (4) Is it feasible and necessary definitely to apportion the value of government services as between services to other enterprises and services to ultimate consumers? One view is that such a segregation of government services is not feasible without making violent assumptions that render the resulting estimates worthless; that in most government activities, services to individuals and to business are inextricably interwoven. Against this view stands an actual statistical attempt at such a segregation and the contention that any estimate of national income necessarily implies segregation. (5) Can the net-value-product of government be determined without knowledge of the incidence of taxes? Some have contended

that it is necessary to distinguish between those taxes which fall upon ultimate consumers and those taxes which come out of business profits or some other distributive share in order to estimate the net value product of government.

This summary of divergent opinions is obviously not intended to be exhaustive with respect to the considerations advanced on the three items discussed, the items on which there is disagreement, or the contents of the preceding volumes. Problems of measuring income in kind from owned consumer goods and property income derived from financial enterprises, two items of considerable quantitative importance, and the usefulness of the end products of statistical estimation have been discussed at some length by the contributors to the volumes. Similarly, the treatment and definition of such items as gifts, occupational expense, income from abroad, entrepreneurial withdrawals and 'business savings'—especially with respect to unincorporated enterprises; and the meaning and techniques of deflation have been the subject of discussion, controversy, and disagreement. Finally, there has been a divergence of opinion on the value of giving wealth inquiries a prominence more nearly equal to that given income inquiries. The most extended discussion of wealth measurement was incidentally an argument that income measurement is more worth while than wealth measurement. While on many of these points the degree of clarification achieved has been greater, on others it has been far less than on the three items just considered. The purpose here is not to present this discussion in detail but rather to delineate in broad strokes the major boundary disputes with which the preceding volumes have been largely, though by no means entirely, preoccupied.

These boundary disputes clarified, at least to the extent that the alternative boundaries are fairly clearly marked, the natural next step is a more detailed survey and study of the character of the area staked out. This study is clearly important in its own right; in addition, it is an essential step before further agreement on the exact boundaries can be expected. Differences of opinion largely center on the usefulness and feasibility of the several concepts, and such differences can be removed only by putting the concepts to a pragmatic test. Conversely, the clarification of the

nature of the boundary disputes is an exceedingly helpful preliminary for a careful exploration of the territory.

The seven papers in this volume proceed to a more detailed examination of the area staked out. They deal with three types of allocation of the national total: among groups classified by size of income or wealth, among the various components of saving and expenditures, and among states. Each type of allocation is considered separately. But their ultimate usefulness will depend very largely on the extent to which they can be interrelated. Thus it is clear from Dr. Wueller's paper and the discussion to which it gave rise that income estimates by states need to be supplemented by distributions of income by size. In the National Resources Committee estimates, one aspect of which is discussed by Miss Baird and Miss Fine, a first step has been made in this direction by the preparation of income distributions for broad geographic regions. The savings estimates presented by Dr. Goldsmith are admittedly exceedingly rough, but it is evident that as more refined estimates become possible it will be desirable to break down those components that admit of it not only by geographic units but also by income class. The allocation of income among various types of consumer's goods and capital formation, discussed by Dr. Warburton, relates partly to consumers' expenditures, and to that extent can and should be cross-classified with distribution of income by size among families in different areas; and partly to investment, and to that extent should be combined with a territorial breakdown.

The discussions in this volume of the three major types of allocation of income and wealth totals carry forward the work on what has been called the second phase in the investigation of national income. However, a wide field for this type of inquiry still remains. We need additional types of breakdowns, some of which we can now list, others of a kind that problems not yet in the forefront of discussion will doubtless require. Thus for many problems, state breakdowns of national income are insufficient, as suggested in the discussion of Dr. Wueller's paper, estimates by size of community within states seem clearly called for. Dr. Warburton's paper and Dr. Copeland's comment on it emphasize the need for estimates by types of commodities and services

more detailed and more adequate than any now available. Many other types of breakdowns could be noted, but those enumerated will perhaps suggest the range of the problem.

The exploration of the problems indicated raises many conceptual questions only briefly if at all touched on in the preceding volumes. The papers by Messrs. Merwin, Goldsmith, Nathan, and Wueller discuss some of these. Still others are suggested by the attempts to obtain distributions of income by size. It is not clear, for example, that definitions appropriate for estimates of national income are equally appropriate for individual income. The desirability of excluding transfers, such as gifts, from national income does not necessarily imply the desirability of excluding them from individual income in constructing distributions of income by size. The situation is similar with such items as capital gains and receipts from illegal activities.

It is thus to be expected that future papers will return to conceptual problems of the sort to which the earlier volumes were so largely devoted, but with the important difference that the treatment of the constituent parts will receive far greater consideration. To many, those especially who hold an unequivocal and dogmatic view of the essential economic concepts and relations, the conceptual phases of our discussion, with the manifest divergence of opinions, may appear superfluous and confusing. To others, the empirical phases of our studies may seem additions of uncertain importance to the conceptual discussion that can formulate the issues so much more sharply and clearly than they can be measured in quantitative terms. To us, both phases seem indispensable in the development of the study of national income and wealth to a level where it will yield efficient tools for economic analysis and social planning.

With one exception, the papers in this volume were submitted to and discussed at the fourth meeting of the Conference on Research in National Income and Wealth held in April 1939 at New York City. The report by Miss Baird and Miss Fine was submitted later but was circulated for comment among the participants in the Conference prior to publication. The editing of

the volume, by Milton Friedman, was reviewed by the other two members of the editorial committee, W. W. Hewett and O. C. Stine.

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Part One

AMERICAN STUDIES
OF THE DISTRIBUTION OF
WEALTH AND INCOME
BY SIZE

C. L. MERWIN, JR.
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
UNITED STATES DEPARTMENT OF COMMERCE

Discussion

SIMON KUZNETS
NATIONAL BUREAU OF ECONOMIC RESEARCH

AMERICAN STUDIES
OF THE DISTRIBUTION OF
WEALTH AND INCOME
BY SIZE

C. L. MERWIN, JR.

THE genetic development of the analysis of wealth and income distribution by size in the United States is not without a cause. This one is tempted to seek in the strands of economic history. The immediate impulse was a Census study by G. K. Holmes and J. S. Lord, entitled *Farms and Homes: Proprietorship and Indebtedness in the United States at the Eleventh Census*. This special study, provided for by an Act of Congress dated February 22, 1892, was the culmination of discussions then raging in legislative halls concerning the concentration of wealth.

The ultimate causes are farther to seek. The rise of industrial trusts provides one clue. Although evidences of industrial integration in the United States appeared as early as 1861 with the cordage industry agreements, the movement did not gain momentum until the last quarter of the century when the Standard Oil trust was formed. By the conclusion of the initiating trust-proper phase of the movement in the 1890's, statisticians had already inaugurated analysis of the distribution of wealth, by size of wealth holding.

Another clue is provided by the trend of wholesale prices. Over the nineteenth century there was a secular decline in wholesale prices which the Civil War inflation merely interrupted. From the currency restabilization in 1871 to the close of the century, prices fell more than a third. The year 1896 represented the all-time low point. Persons enjoying fixed incomes (e.g., recipi-

ents of property income) stood to profit from falling prices; while persons burdened with fixed charges (e.g., farmers with mortgages) felt the pinch of the price decline.

The mere existence of these positive correlations does not imply a cause-and-effect relationship between the rise of trusts and the decline in prices on the one hand, and analyses of distributions of wealth and income on the other. Yet such concomitance does suggest a relationship between economic history and academic interests, and warrants the presumption that wealth and income distribution analysis was launched to fill a pressing social need, not merely to provide academic jousts for statisticians.

Although the trust movement and price trends have been carefully described and analyzed by scores of investigators, little has been written on the statistical attempt to analyze the problems raised by this economic and social transition. The object of this paper is to delineate, in Sections I and II, the historical strands of wealth and income distribution analysis. These sections are concluded by recapitulations in outline form, which serve to emphasize the salient characteristics of these earlier studies. In a concluding section speculation is ventured concerning possible reasons why distributions of wealth and of income thus far constructed have been relatively inadequate.

I American Studies of the Distribution of Wealth

1 HISTORICAL AND METHODOLOGICAL REVIEW

The stub of a tabular distribution of wealth, by size, would show a series of wealth classes ranging from, say, '0-\$500' to '\$1,000,000 and over'. The frequencies would give the number of individuals, families, or some other wealth-holding unit in each class; for example, the number of persons possessing wealth valued at '0-\$500' and at '\$1,000,000 and over'.

The two substantive elements in the distribution of wealth by size are the nature and dollar amount of the wealth that is distributed, and the nature and number of the wealth-holding units. The first is commonly referred to as national wealth, the estimation of which is a problem all its own.¹ The second hinges

¹ See Simon Kuznets, *Studies, Volume Two* (1938), Part One

on a decision as to among whom (or what) the wealth is distributed. We could, for example, tabulate the distribution of wealth, by size, among individuals, families, estates, corporations, and other more or less homogeneous entities. In addition, the distribution could be by subdivisions of each of these units. In this paper the distribution of wealth is considered with respect to the individual, family, and estate units.

No complete census of wealth holdings by any of these units has ever been taken in the United States. Therefore, attempts to construct a distribution of wealth must rely on samples of the universe, or on wealth's possible functional relationship with some other variable such as income, tax payments, house ownership. When samples are used, there is the problem of extending the partial picture to give a complete description. Frequently the other aids mentioned above are employed in this task, but sometimes the extension of the sample is a matter of sheer guesswork. To enhance its applicability and augment its coverage, the sample may be treated beforehand, by means of supplementary data and arbitrary assumptions. In any case the problems confronting the investigator are numerous and difficult, as the descriptions of these studies on the following pages illustrate.

a) *Holmes' attempt*

At least two publicized attempts were made in the last decade of the nineteenth century to estimate the distribution of wealth in the United States.

The first, by G. K. Holmes in 1893,² was a modest statistical inquiry, based on census data, into the number of families of different economic characteristics in the United States and the wealth possessed by each class of family. Of the 12,690,152 families enumerated in the 1890 Census, 11,593,887 were classified into six categories which included farm-hiring families, families owning encumbered farms, families owning free farms, home-hiring families, families owning encumbered homes, and families owning free homes. The allocation of families to these categories was accomplished by a complicated procedure involving farm and home proprietorship data, averages of the farm and home possessions and indebtedness of the various types of fami-

² 'The Concentration of Wealth', *Political Science Quarterly*, VIII (1893), 589-600.

lies, assumptions as to the number of farms and of families occupying non-farm houses, and arbitrary allowances for 'other' possessions and debts of each class of family. Together these families were estimated to possess \$17,356,837,343. Since the national wealth was set by Holmes at "about sixty billions of dollars",³ 91 per cent of the families, therefore, owned 29 per cent of the wealth, and, by subtraction, 9 per cent of the families owned 71 per cent of the wealth. Having estimated the wealth of the poorer class, Holmes directed attention to that of the very rich. According to a *New York Tribune* estimate of 1892,⁴ there were 4,047 millionaires in the United States. Holmes assumed that their average wealth was \$3,000,000; which meant that they held 20 per cent of the total wealth. His final distribution of wealth, in Lorenz curve form, was:

03 per cent of families (i.e., the millionaires) own 20 per cent
 9 per cent of families (excluding millionaires) own 51 per cent
 91 per cent of families own 29 per cent⁵

From added comments of Holmes concerning the wealth distribution among the poorer classes, it is possible to split up this distribution of wealth in 1890 into five classes, from rich to poor:

PERCENTAGE OF FAMILIES		PERCENTAGE OF WEALTH	
SIMPLE	CUMULATED	SIMPLE	CUMULATED
.03	03	20	20
8.97	9.00	51	71
27.00	36.00	20	91
12.00	48.00	4	95
52.00	100.00	5	100

b) Spahr's distribution

The second pre-twentieth century estimate of the distribution of wealth, statistically more pretentious than the first, was published

³ *Ibid.*, p. 590. The Census estimate of the total value of tangible property in the United States was \$65,000,000,000, see *Compendium of the Eleventh Census: 1890* (Washington, 1898), Part III, p. 94. Holmes' figure seems designed to approximate this estimate, and perhaps the fact that it was made five years earlier explains why it fell five billion dollars short.

⁴ Thus, and a similar *New York World* list of millionaires, are described in G. P. Watkins' 'The Growth of Large Fortunes', *Publications of the American Economic Association*, 3d ser., VIII (1907), 141-7.

⁵ Holmes, *op. cit.*, p. 593.

by C. B. Spahr in 1896.⁶ He based his analysis on figures for probated estates obtained from the Surrogate records of New York State. Data were collected for 36 counties, including the area comprised by New York City and Brooklyn, and having a population of 4,625,000 persons, for October, November, and December of 1892. Because they were not deemed representative, the figures for New York City and Brooklyn were excluded, leaving the accompanying distribution of probated estates, which was used as the basis for the subsequent distribution of wealth in the United States.⁷ Once these basic data were acquired, generalized

WEALTH CLASS	PERCENT- AGE OF		REALTY	PERSONALTY	TOTAL WEALTH	PERCENT- AGE OF WEALTH
	ESTATES	ESTATES				
\$50,000 and over	36	2	\$2,188,540	\$6,606,123	\$8,794,663	55
50,000-5,000	409	22	2,950,325	2,233,871	5,184,196	32
Under \$5,000	1,427	76	989,668	1,095,430	2,085,098	13

assumptions and personal observation ("common observation shows") were relied upon to effect the transmutation of this distribution for certain New York counties into one for the entire country. Spahr reasoned that the figure in this category should be increased about one-half to allow for the many small real estate holdings not recorded in rural counties. Similarly, large personalties were underestimated to avoid the tax, and small ones were eaten up to pay debts; so the latter should be cut one-half. Effecting these transformations,⁸ he arrived at a 'corrected' distribution of these New York estates.⁹ Thus far it has been pos-

WEALTH CLASS	PERCENT- AGE OF		REALTY	PERSONALTY (millions of dollars)	TOTAL WEALTH	PERCENT- AGE OF WEALTH
	ESTATES	ESTATES				
\$50,000 and over	36	2	2 25	6 75	9	56
50,000-5,000	409	22	3 00	2.00	5	31
Under \$5,000	1,427	76	1.50	50	2	13

sible to follow Spahr's statistical juggling even though one may disagree with certain of his assumptions; but in the transforma-

⁶ *The Present Distribution of Wealth in the United States* (New York, 1896).

⁷ *Ibid.*, p. 64. Spahr did not compute the percentages for his distributions, but since they are utilized in the argument, they are inserted in the tables.

⁸ And rounding off the resulting figures to the nearest quarter million, Spahr could well have added.

⁹ *Ibid.*, p. 65.

tion of this last distribution into one for the entire country, even the statistical manipulations are hard to perceive. He had announced his intention of "applying these proportions [of the above table] to the nation at large",¹⁰ but he modified this resolve by saying "with much precision" that one-eighth of the "families"¹¹ of the country hold property worth more than \$5,000. This decision was based on the distribution of estates in New York City, the Census investigation of farm mortgages, the distribution for New York State outside the two large cities and the assumption of "a normal death-rate".¹² The further division of this one-eighth between '\$50,000 and over' and '\$50,000-5,000' was apparently harmonized with the proportion (2 to 22) exhibited in the distribution above, so that the table "for the nation at large" becomes:¹³

WEALTH CLASS	FAMILIES (thousands)	PERCENT- AGE OF FAMILIES	AGGREGATE WEALTH (billions of dollars)	PERCENT AGE OF WEALTH
\$50,000 and over	125	1	33	51
50,000-5,000	1,375	11	23	35
Under \$5,000	11,000	88	9	14

Even if we accept as sufficiently justified Spahr's division of family holdings into 12 per cent over and 88 per cent under \$5,000, there is still the question how he distributed aggregate wealth. If these proportions were meant to follow those in either of the preceding tables, then his arithmetic was 'rough' in the direction of decreasing the inequality of wealth distribution.¹⁴

¹⁰ *Ibid*, p. 64

¹¹ Spahr changed his terminology from 'estates' to 'families' without warning or explanation. In the rest of his analysis he seems to use 'families' and 'estates' almost indiscriminately. Yet by a family he tells us (p. 66n) that he means "a family of five"

¹² *Ibid*, p. 66.

¹³ *Ibid* Spahr states (p. 66n) that "nearly one billion dollars [has been] added [to the aggregate wealth of the 'under \$5,000' category] for small estates containing only household goods and the like" It will be observed that the total aggregate wealth, \$65,000,000,000, is that given by the Eleventh Census for the true valuation of the tangible property in the United States (see footnote 3 above) and the total number of families is approximately that given by the same Census (*Compendium*, Part I, p. 856)

¹⁴ On the other hand, the changes he made in the percentage of families in each class served to increase the inequality of wealth distribution relative to that in the preceding tables.

Spahr did not elucidate this transition, but went on to subdivide the 'under \$5,000' class into '\$5,000-500' and 'under \$500' categories. The Census returns indicated that in the cities the number of families owning over \$500 worth of property was 'perhaps' one-third greater than the number owning their homes, while in the small towns and rural districts it was 'perhaps' one-sixth greater. As few holdings of real estate were valued at less than \$500, "in the nation at large" the families worth more than \$500 numbered 'perhaps' 1,000,000 more than those that owned their homes or farms. That is, about 7,000,000 were property-owning and about 5,500,000 could "justly be spoken of as propertyless". Under an assumption that the latter, as a rule, had household property worth \$150, Spahr's final distribution of wealth for 1890 stood as follows:¹⁵

WEALTH CLASS <i>(thousands)</i>	PERCENTAGE OF FAMILIES			AGGREGATE WEALTH <i>(billions)</i>	PERCENTAGE OF WEALTH		FAMILY AVERAGE
	FAMILIES	CUMU- SIMPLE	LATIVE		CUMU- SIMPLE	LATIVE	
\$50,000 and over	125	1	1	\$33 0	51	51	\$264,000
50,000-5,000	1,375	11	12	23 0	35	86	16,000
5,000- 500	5,500	44	56	8 2	13	99	1,500
Under \$500	5,500	44	100	8	1	100	150

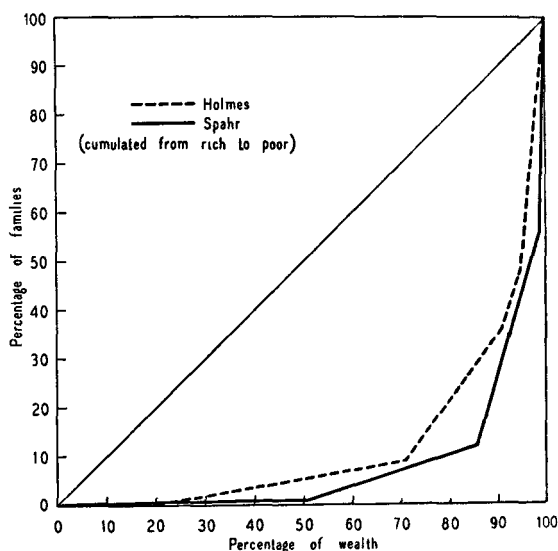
Before continuing the historical summary, it is interesting to compare the wealth distributions for 1890 constructed by Holmes and Spahr. Chart 1 shows these two independent estimates in the form of Lorenz curves. The percentages of wealth are plotted along the X-axis and the percentages of families along the Y-axis. Both sets of percentages are cumulated, from rich to poor. The reference points are meagre, and the straight lines connecting them are merely aids to the eye, not indicators of where the intermediate points would fall. The difference in the inequality indicated by the two curves is significant, but not so striking as one might have expected considering the dissimilar methods and the many arbitrary assumptions of the two investigators. The greater inequality shown by Spahr's curve is probably largely attributable to the nominal value he placed upon unreported estates, and to certain other statistical juggling in which he indulged. It is hard to say which distribution is closer to the actual distribution of wealth.

¹⁵ *Ibid*, pp. 68, 69.

c) *Contributions of W. I. King*

A decade elapsed before another inquirer seriously attempted a distribution of wealth even for selected sections of the country, and another twenty years before a third attempt was made to distribute, by size of holding, the nation's material wealth.

Chart 1
LORENZ CURVES OF HOLMES' AND SPAHR'S
DISTRIBUTIONS OF WEALTH,
UNITED STATES, 1890



The pioneer work in the field of the distribution of wealth and income by size in the United States was done by W. I. King in 1915.¹⁶ Although he did not venture to derive a complete distribution of wealth, his familiarity with statistical tools makes his analysis of the Massachusetts probated estates data sufficiently important to warrant mention in this survey. The original data, themselves a landmark, are contained in the *Twenty-Fifth Annual Report* (1894) of the Massachusetts Bureau of Statistics of

¹⁶ *Wealth and Income of the People of the United States* (New York, first published 1915, printing cited here is that of 1923), especially pp 66-76

Labor, and comprised the values of estates probated in Massachusetts during the four triennial periods 1829-31, 1859-61, 1879-81, and 1889-91.¹⁷ The estates were classified as to ownership by males or females. For 40 per cent of the estates no inventory was filed. King excluded the estates of females and assumed that the non-inventoried estates were of the same size and distribution as those filed with inventories. He found from Census reports that the number of deaths of males 25 years or over in Massachusetts for the three periods considered (1859-61, 1879-81 and 1889-91) exceeded the number of estates filed. He assumed that these non-probated estates were insignificant in value, with an upper limit of \$500 and an average value in the first period of \$375 and in the other two periods of \$400. The resulting distribution contains twelve categories ranging from \$0 to \$500,000. A similar analysis was made of estates probated during 1900 in six Wisconsin counties, the original data for which appeared in an unpublished manuscript by M. O. Lorenz. No attempt was made to derive from these Massachusetts and Wisconsin data a distribution of wealth for the entire country.

When King returned, some twenty years later, to the task of constructing a distribution of wealth,¹⁸ his insight into the prob-

¹⁷ C. D. Wright left the Massachusetts Bureau to head the new National Labor Commission in 1888, but he was nonetheless instrumental in launching this survey begun "some years" before publication of the preliminary results in 1894 (Massachusetts Bureau of Statistics of Labor, *Twenty-fifth Annual Report*, 1894, p. 55) G. K. Holmes also assisted the Bureau in this work.

¹⁸ W. I. King, 'Wealth Distribution in the Continental United States at the Close of 1921', *Journal of the American Statistical Association*, XXII (1927), 135-53. This article represents the product of a much more extensive investigation than its length would indicate. King became associated with the National Bureau of Economic Research soon after its establishment in 1920, and continued the study of wealth and income distributions initiated in his first book, *Wealth and Income*. With a corps of assistants he constructed distributions of both wealth and income for the United States in 1921. As a result of his labors, two book-length manuscripts now on file at the National Bureau of Economic Research were prepared. One, entitled 'The Distribution of Earnings, Income and Wealth in 1921', never progressed beyond the typewritten stage, although it was completed and signed by King on October 1, 1925. The other, entitled 'Gradations of Earnings and Income in 1921', apparently came nearer publication, for it was mimeographed and given a table of contents and a title page with a 1926 dateline. The latter manuscript was a recasting of the first half of the former manuscript.

Curiously enough, the article here cited was essentially an abstract of the second

lem had broadened considerably. He not only realized that the distribution of wealth among decedents was far from being the distribution of wealth among the living, but he even conceded the criticism of Judge R. S. Galer and W. R. Ingalls that the distribution of wealth among decedents also did not measure the distribution of wealth among persons near the end of their careers. The latter relation, previously claimed by King, was challenged on the grounds that (a) many estates are not probated at all, (b) some property is held by joint title so that no court record is necessary on the death of one of the title-holders, (c) some property is transferred at death without any record of its value (i.e., it is not inventoried), (d) gifts often anticipate death. As a consequence, King concluded that the distribution of wealth may be approached through three channels: distribution of (a) estates, (b) wealth among persons shortly before death, (c) wealth among all the inhabitants of an area.¹⁹ Since no data were available on the second type of distribution, King was limited to estimating the distribution of wealth by the first and third approaches.

The Federal Trade Commission in its study of *National Wealth and Income*, published in 1926, presented data on estates probated during 1912-23 in twenty-four counties in twelve widely scattered states and the District of Columbia. By estimating from Census reports the number of wealth-owners (defined to be 'gainfully employed') who died in these counties during these years, and by assigning to unreported estates an arbitrary value of \$100, King constructed an estimate of the distribution of wealth among decedents.²⁰

portion of the former typewritten manuscript which, as just noted, apparently did not come as near publication as the first portion on income

The present investigator was given permission by the National Bureau of Economic Research to read both these manuscripts. This makes it possible, in this section, to amplify the description of King's methods; and in the next section, to describe a hitherto unpublicized distribution of income. In the discussion of King's 1921 distribution of wealth, reference will be made to the published article rather than to the unpublished manuscript, wherever possible

¹⁹ King, 'Wealth Distribution . . .', pp. 141, 143, 144. King refers specifically to Ch. X of W. R. Ingalls, *Current Economic Affairs* (York, Pa., 1924). On p. 144 of Ingalls' opus appears a recantation, by King, of the probated estates method

²⁰ King, pp. 141, 144, 145. The data King used are contained in Ch. II (especially Table 10 on p. 58) of the Federal Trade Commission report entitled *National Wealth and Income*, Sen. Doc. 126, 69th Cong., 1st Sess. (Washington, 1926). The

In the manuscript the attainment of this objective was more fully explained. Nine-tenths of the \$260 billion of wealth in the United States,²¹ i.e., \$230 billion, were assigned to adults, both male and female. Of these, 4,580,000 died during 1916-21, and to these decedents were allotted \$30 billion of the \$230 billion of wealth. By extrapolating relevant Massachusetts data, King estimated that two-thirds, i.e., \$20 billion, belonged to the 2,420,000 adult males dying during this period. With this as a background, he proceeded along two routes toward the distribution goal. In the first, he plotted on double logarithmic paper the Massachusetts and the federal estates data. Observing that the two curves were parallel in the upper wealth class brackets, he extrapolated the federal data to the lower wealth classes in the manner indicated by the Massachusetts data. The insufficiency of this method became apparent when the total wealth thus distributed was summated: it turned out to be only a third of the previously ascertained total of \$20 billion. So this approach was discarded in favor of another.

The second route to the distribution goal was rather more devious. The federal data were first reduced from a gross to a net estate basis, and the class limits correspondingly scaled. Then King proceeded to distribute, by several estate classes over \$50,000 and one class under \$50,000, the number of estates of adult male decedents, and their values. The federal data distributed the adult decedents that were in the classes over \$50,000. The rest of the 4,580,000 who died were put in the 'under \$50,000' category. To this distribution were applied the 1890 Massachusetts figures for the percentage of estates belonging to males, the 'under \$50,000' class again being the residual. The resulting distribution was reduced to percentages, cumulated, and converted to logarithms. The values of estates were distributed by a similar procedure: those of males alone were made to total \$20 billion, and 1890 Massachusetts percentages were used to derive the value of estates of males from the value of estates of both

Federal Trade Commission in its tabulation allotted \$258 (the average value of the poorest class of estates probated) to the non-probated estates, while King, as we have seen, allotted only \$100 to such estates.

²¹ An estimate offered by King on p. 322 of an article entitled 'The Net Volume of Saving in the United States', *Journal of the American Statistical Association*, XVIII (1922), 305-23. This figure is apparently an average value for 1916-19.

males and females. As before, the distribution above the \$50,000 mark followed the federal data, while the 'under \$50,000' class absorbed what remained.

With both these distributions reduced to logarithms, the next step was to plot them, after which readings were taken from the curve to show the distribution of estates among the various percentages of the holders. This made possible construction of a Lorenz curve and comparison with the Massachusetts data for 1889-91. On the basis of this comparison wealth seemed to have become distributed much more evenly between 1889-91 and 1916-21; so much more, in fact, that doubt was cast upon the reliability of one or both sets of data. After consideration of possible sources of bias in the two sets, King concluded that the true curve probably lay between the line representing the Massachusetts data and that representing the federal estates data.²²

Developing W. R. Ingalls' method of analyzing inventories and capitalizing income, King constructed the third type of distribution of wealth: among all the inhabitants of the United States.²³ His method was very complicated and the published explanation is meagre. Examination of the manuscript, however, makes possible the following more detailed description.

King's general approach was (1) to distribute the farm wealth among farm owners and tenants, (2) to distribute the non-farm wealth among non-farmers, (3) to combine these distributions into a distribution of wealth among all property-owners.

Net wealth of farm owners was estimated from census records by a complicated system involving sundry assumptions concerning the proportion of agricultural debt borne by farm owners, the proportion of tenants' equipment they possessed, and the

²² W. L. Crum has subjected these federal estate tax data to rigorous statistical analysis in 'The Distribution of Wealth', *Harvard Business Report*, No. 13 (October 1935). He does not venture a complete distribution of wealth; instead, he ignores the lower wealth classes and analyzes the tail of the distribution, along the lines laid down by Pareto.

²³ King, 'Wealth Distribution', pp. 146-53. See especially Ingalls, *op. cit.*, Ch. X, cited by King. This chapter is a reprint of an article appearing in *Iron Age*, October 4, 1923, which was written to disprove the popular belief that 2 per cent of the people own 65 per cent of the wealth in the United States. This belief, incidentally, is traceable to King's *Wealth and Income*. Although he made no attempt to construct a distribution of wealth, Ingalls concludes that the richest 2 per cent own about one-third of the wealth.

like. The final figure, for the end of 1921, was set at \$46.5 billion, which was then parceled out among the 3,928,000 farm owners. This total wealth of farm owners was first distributed by size of farm, on the basis of Census data on the value of farm property in farms having various acreages. Since the Census gave also the number of farms in each size class, the assumption that the proportion of tenant-owned farms in each size class was the same reduced this raw Census distribution to a farm owner basis. The wealth in each size class was then split between owners and tenants in the same proportion as total acreage in each size class was split between these two groups. The final step was to cumulate the wealth (size) classes and farm owner frequencies, and read off at the desired wealth class intervals the corresponding frequencies. Decumulation gave the distribution of wealth among farm owners. The resulting curve was smoothed, and the total wealth made to equal \$46.5 billion. By similar statistical procedures and arbitrary assumptions the net wealth of farm tenants was estimated and distributed.

King next turned the spotlight on the distribution of wealth among non-farmers, including agricultural laborers. The first step was to calculate the distribution of holdings in the stocks of corporations. The next was to estimate the corporate bond holdings of each wealth class. The funded debt held by individuals was distributed among income groups in the same proportions as interest payments. The third step was to distribute the holdings of government bonds among non-farmers, which was also done on the basis of interest payments.

The sum of the wealth thus far accounted for—wealth of farm owners, wealth of farm tenants, and securities held by non-farmers—totaled only one-half of the Census estimate of \$298.4 billion of privately owned wealth in the United States at the end of 1922. This Census estimate, when adjusted to December 31, 1921 conditions, became \$281.2 billion, which agreed fairly well with an independent National Bureau of Economic Research estimate of \$291.1 billion. Diverse methods were employed to distribute the other half of the total wealth. Real estate was distributed along the lines indicated by *Statistics of Income* data on “profits from sales of real estate, stocks, bonds, etc.”, “rents and royalties”, and “interest and investment income”; urban

owner-occupied houses and other consumption goods were distributed according to the current money income received by the corresponding sections of the population; and the value of residual, miscellaneous wealth items was distributed on the basis of the *Statistics of Income* data on "profits from sales of real estate, stocks, bonds, etc.", from "business" and from "partnerships, fiduciaries, etc."

As a result of this manipulation, King succeeded in distributing wealth among non-farmers by income classes. The next step was to pass to wealth classes. The technique, called Method H, was frequently employed by King and merits quotation:

*"Method of Constructing a Frequency Table from a Table
Giving the Total Wealth and Number of Persons in Each
of a Number of Irregular Classes*

1 Cumulate the number of persons. Cumulate the amounts of wealth. Plot the cumulated quantities against each other. Run a smooth curve through the points.

2. Take frequent readings from the curve showing the cumulative numbers of persons and their cumulative wealth at each point.

3. Decumulate the record showing the numbers of persons to find the numbers of persons in the new classes. Decumulate the wealth readings to find the total wealth in each of the new classes. Divide the wealth in each class by the number of persons in the class to find the average wealth of the class.

4. Take the mid-points between the cumulative frequencies found in (2), and plot against the average wealth in each class.

5. Take readings on this cumulative curve at the desired class limits for wealth. Decumulate to find the numbers of persons in each class.

6. Get an approximate verification of the results by multiplying the mid-point of each class²⁴ by the average wealth of the class and summing the products. The total should correspond with the known aggregate of wealth.

7 If it does not approximately correspond, the number of classes in (2) is not large enough. By summing the wealth in separate sections of the distribution and comparing with the decumulated

²⁴ This appears to be a typographical error in the original manuscript. Presumably 'number of persons in each class' should be substituted for 'mid-point of each class'

figures in the early part of the curve, it may be possible to locate the region in which the major errors occur. In these regions, more readings should be taken in (2) and the later steps should be repeated. This process should be continued until the results are satisfactory."

The final step in King's construction was to combine the three distributions of wealth among farm owners, farm tenants, and non-farmers. The resulting distribution gave the number of wealth owners, i.e., income recipients, in each of 48 wealth classes ranging from "\$0 up to \$200" to "\$40,000,000 and over". In this manner \$281 billion in wealth was distributed among 41 million wealth holders (i.e., income recipients).

Salient features of the inequality in the distribution of wealth were pointed out at various places in the manuscript, by means of simple percentages and Lorenz curves. The latter showed, incidentally, the distribution of Massachusetts estates to be the most unequal of the three distributions, while the distribution of the estates reporting under the United States inheritance tax was the least unequal, and the distribution among the living occupied a middle ground. No conclusions respecting the social desirability of the existing distribution were essayed.

King is credited also with a distribution of wealth for 1928, constructed for the Hanover Bank and Trust Company. W. Tresckow, vice president of the bank, published it in 1931²⁵ under the title, 'Estimated Cumulative Distribution of Private Property of Individuals among the Entire Population'. The cumulation is from rich to poor. The distribution applies to the continental United States, as of the end of 1928, and contains forty wealth classes. By means of Lorenz curves it is compared with King's distribution for 1921. No comments concerning the methods or data used in constructing the 1928 distribution are offered by Mr. Tresckow. His sole concern is with the significance of these data for trust departments of banks. Moreover, there seems to be no publication by King describing this distribution.²⁶

²⁵ 'Trust Business Possibilities; The Distribution of the Wealth of the United States and Potential Trustors', *Burrough's Clearing House*, September 1931, pp. 13-15, 43, 44.

²⁶ In a letter to the writer dated April 4, 1938, King stated that the method was fundamentally the same as that used in calculating the 1921 distribution of wealth.

d) *Doane's 'greater diffusion'*

Since King's endeavors, only one attempt to distribute by size the wealth of the people of the United States seems to have been published: that by R. R. Doane in 1935. In a series of articles in the *Annalist*,²⁷ Mr. Doane patently set out to justify the present distribution of wealth, using as his basic data probated estates figures previously analyzed by other students of the problem and tax payments information appearing in official publications. The latter procedure holds special interest for us, since by means of total tax payments and certain other information in the Treasury Department's *Statistics of Income* and the Census publication, *Financial Statistics of State and Local Governments, 1932*, Doane constructed a distribution of gross private wealth holdings by income classes in the United States for 1932.²⁸ He launched his

²⁷ 'Summary of the Evidence on the National Wealth and Its Increasing Diffusion' July 26, 1935, pp. 115-8,

'An Accurate National Wealth Census Statistical and Other Limitations', Aug 2, 1935, p. 158,

'Tax Payments as an Aid to More Exact Measurement of Wealth Distributions', Aug 9, 1935, pp. 189, 214,

'Changes in the Distribution of Wealth Since 1880, Greater Diffusion Shown', Aug 16, 1935, pp. 222-4,

'The Geographic Distribution of the Physical Wealth in the United States', Nov 15, 1935, pp. 676-9,

'Property Ownership by States, Security Holdings, Insurance Equities, etc', Dec 20, 1935, pp. 844-6,

'The Division of the National Wealth between Farm and Non-Farm Property', Jan. 31, 1936, pp. 196, 197,

'Distribution of Corporate, Individual and Public Debts and Equities, 1932' May 15, 1936, pp. 718, 719, 725

Several other *Annalist* articles, not originally intended to be a part of this series nevertheless belong there

R. H. Jackson, 'Full Text of Memorandum on the National Wealth and Its Distribution', Aug 30, 1935, p. 292 (a criticism of the methods and figures used by Doane in his third article);

R. R. Doane, 'Rejoinder', Aug 30, 1935, pp. 292, 293, 312,

S. N. Whitney, 'Weakness of Data Supporting Conclusion of Increase in Diffusion of Wealth', March 6, 1936, pp. 368, 369, 392,

R. R. Doane, 'Statistical Bases for National Wealth Estimates', March 27 1936 p. 478 (a reply to Whitney's criticism),

S. N. Whitney, 'Statistical Bases for National Wealth Estimates', April 10, 1936 pp. 542, 562 (a further rebuttal to Doane, in letter form)

²⁸ See p. 189 of his third article listed above. Incidentally, Doane in several instances cites p. 68 of the Census report on *Financial Statistics of State and Local*

construction by distributing total tax payments (other than federal income taxes) by income classes above \$5,000, adding corporate taxes to this total and allotting the rest of the tax bill (ascertained in an unexplained manner) to all income classes under \$5,000. Although some of the arithmetic is not clear, Doane seems to have distributed the Census total for annual valuation of property among (1) income classes over \$5,000, (2) corporations, (3) a 'non-reporting' group later assumed equal to income classes under \$5,000. This allocation was carried out roughly according to a Census estimate that the average tax rate per \$100 of assessed valuation was \$3.08 in 1932. The tax payments were distributed among the income classes over \$5,000 apparently in proportions derivable from *Statistics of Income* data for 1932. His references to this source are too general to allow checking these percentages. Once the general property was distributed, the corporate holdings were dropped out, the group 'non-reporting' was labeled 'under \$5,000', and the addition to this distribution of intangible property was undertaken. Relying primarily on *Statistics of Income* data he allocated to the various income classes tax exempt securities, other bonds, notes and mortgages, capital stock, savings and other deposits, and life insurance equities.²⁹ His resulting distribution presented total gross holdings by income classes, with incomes above \$5,000 divided into nine categories, and those under \$5,000 included in one category. No figures were given for the number of wealth holders (or of income recipients). During the week a significant transformation of this distribution took place, for in the next (the fourth) article it was summarized in such a fashion that the incomes under \$5,000 fell into four classes, and the percentages of total number and value were given not only for each of these four classes but also for each of eight classes over \$5,000. Neither the method of ascertaining and distributing the number of wealth holders nor the manner in which the wealth holdings of the 'under \$5,000' class were divided into four sub-categories is indicated. No absolute figures are given in the final distribution, only the percentages. *Governments*, 1932, when he must mean p. 66; a table of contents appears on p. 68.

²⁹ It was with this phase of his analysis that R. H. Jackson, then Counsel for the Bureau of Internal Revenue, raised his most serious objections. Jackson characterized Doane's figures as "very misleading"; see *Annalist*, Aug. 30, 1935, p. 292.

ages of an unknown total. Apparently it is to be taken on faith, and in any case it is in terms of wealth per income class, not per class of wealth holders.

The rest of Doane's analysis, in which he tries to demonstrate an increasing diffusion or lessening inequality in wealth distribution since 1880, is not of particular interest to us because he uses (sometimes in misleading form)³⁰ data, prepared by other investigators, with which we are already familiar: Massachusetts estates data for 1879-81, Lorenz's data for six Wisconsin counties in 1900, King's computation of a complete distribution of wealth for the continental United States in 1921, and, finally, his own figures for the distribution of wealth in 1932.

e) *Lehmann's novel method*

In recent years an ingenious method for estimating the amount of wealth held by the richer classes has been employed by Fritz Lehmann. In his contribution to *Political and Economic Democracy* a general outline of the method is presented. In a later publication, it is explained further.³¹

Briefly, the method runs as follows: From the estate tax tabulation in *Statistics of Income* ascertain the average value of estates in each estate class by subtracting 90 per cent of the 'Debts, unpaid mortgages, etc.' from the 'Total gross estate' and dividing the remainder by the number of returns in the given estate class. Determine by correlation the function relating this average value of estate to the item 'Capital stock in corporations',

³⁰ For example, estates of females were not excluded from the Massachusetts data, although King was careful to subtract them because it could not be expected that their estates would be comparable to those filed by males. By including the estates of females, Doane increased the inequality of his earliest distribution, which had the effect of indicating an increasing diffusion of wealth through time when it was compared with the later figures.

³¹ Fritz Lehmann, 'The Distribution of Wealth', *Political and Economic Democracy*, ed. by Max Ascoli and Fritz Lehmann (New York, 1937), pp. 159-75. Gerhard Colm and Fritz Lehmann, *Economic Consequences of Recent American Tax Policy*, supplement 1, (1938) to *Social Research*. See especially pp. 43-53, and Appendix A, prepared by Charles Stewart, entitled 'Method of Estimating the Influence of the Personal Income, Gift and Estate Taxes upon Savings and the Distribution of Wealth', pp. 91-8. For a detailed statement of the technique and evaluation of its advantages and limitations see Charles Stewart, Part Two, discussion by W. L. Crum, Milton Friedman, and Fritz Lehmann, and Mr. Stewart's reply.

found in the same estate tax table. By means of (a) this function, (b) the personal income tax tabulation of 'Dividends on stock of domestic corporation', and (c) an assumed average dividend rate for common stock, compute the average size of estate corresponding to the various income classes. That is to say, from the regression line associating stock holdings with average size of estate 'read' the average size of estate corresponding to the capitalized value of common stock dividends.

There are several statistical defects and arbitrary assumptions implicit in this method, as Lehmann is careful to emphasize. Moreover, it gives only the tail of the wealth distribution, and fails to tell anything about the bulk of the wealth holdings. Finally, it shows the wealth holdings by the constituents of income classes, not of wealth classes; so there remains the problem of passing from income to wealth classes. Nevertheless, the results have a fair share of utility, and Lehmann's analysis is an excellent example of those problems the study of which is facilitated by a knowledge of the size distribution of wealth and income.

2 PURPOSE OF THE STUDIES

It was no mere coincidence that the Sherman Anti-Trust Act and the genesis of a more or less intensive study of the distribution of American wealth both occurred in the last decade of the nineteenth century. The first phase of the so-called trust movement—characterized by trusts-proper, such as the original Standard Oil combine of 1879—was drawing to a close, and the growth of monopolies was about to enter upon its second phase, that of holding companies and giant consolidations. Moreover, the secular fall in prices had reached its trough.

a) *Early students ethically motivated*

Both Holmes and Spahr seemed to be gravely concerned about the inequality in the distribution of wealth indicated by their estimates. They were apparently more interested in the social implications of the figures they compiled than in the accuracy and representativeness, from a statistical standpoint, of their resulting distributions. Holmes did not make a specific study of the tax problem in his article, yet he did suggest "progressive taxes on income, gifts and inheritances" to keep the concentra-

tion of wealth from going too far.³² Spahr, although his book was labeled *The Present Distribution of Wealth in the United States*, nevertheless felt that the inequality in this distribution warranted devoting the concluding portion of his text to the problem of taxation, especially the inequity of the tax burden in relation to the distribution of wealth and income. Singularly enough, although he was writing before the days of our income tax, he concluded that the tax burden with respect to income was relatively just, but with respect to wealth, relatively unjust. He even forecast a progressive property tax, so alarmed was he by the widening gulf between classes. Finally, Spahr pondered taxation as a solution to the wealth distribution problem long enough to perceive that "the future laws which shall make better or worse the distribution of property are likely to accomplish their end, not by the bodily transfer of property from one class to another, but by making more equal or more unequal the distribution of the future incomes of the people".³³ This quotation confirms a suspicion held as early as Spahr's day that the real key to the problem of the concentration of wealth resided ultimately in the distribution of income.

b) *King's purpose statistical*

By the time King made his analysis of the *Wealth and Income of the People of the United States* in 1915, he was able to say without serious danger of being controverted that the distribution of income was more important than the distribution of wealth, and that the latter would not need to be analyzed, were it not that the possession of wealth gives power. Before launching his statistical inquiry, King discussed in general terms the problem of wealth concentration, and concluded that only a moderate (not the existing) inequality in distribution of wealth was justified by social and economic considerations. Not until the end of the book did he revert to the ethical problem involved in wealth and income distribution, when he cited population as a controlling factor, and emphasized the slogan "Poverty must go".³⁴ No program of taxation was proposed, and a transfer of

³² Holmes, *op. cit.*, p. 600

³³ Spahr, *op. cit.*, p. 73

³⁴ King, *op. cit.*, pp. 238-55.

wealth was frowned upon. The problem foremost in his mind seemed to be statistical. He was concerned with constructing an accurate and representative distribution of wealth for 1910. It has already been pointed out that this analysis was only for selected sections, not for the country as a whole. Therefore, our chief interest centers on a later work by him, in which a complete distribution of wealth for the continental United States was essayed.

In this second study, King seems to have changed his mind somewhat as to the usefulness of wealth distribution analysis, for he states that "from the social standpoint, nothing can be of greater significance" than the distribution of wealth per person or per family.³⁵ As before, he asserted that "the outstanding characteristic of wealth is that to its owner it gives power", and that "the possession of wealth is a great convenience".³⁶ He now emphasized, perhaps more than before, the political significance of wealth, a wide diffusion of wealth being taken to imply political stability. Aside from these brief comments, King in his second study was concerned solely with the statistical problem of constructing a distribution of wealth among the inhabitants of the United States. Even the slight ethical tinge of his preceding study is absent, by design.³⁷

c) *Doane an apologist*

The purpose of the most recent complete distribution of wealth is not far to seek. Doane is an apologist for the present concentration of wealth in the United States, and his purpose was not only to show that wealth concentration is decreasing but that the current inequality in the distribution of wealth is justified on the basis of age differences in the population. The problem of statistical analysis seemed to be secondary, though the study

³⁵ 'Wealth Distribution in the Continental United States at the Close of 1921', p. 139.

³⁶ *Ibid.*, p. 140.

³⁷ *Ibid.*, p. 153. No elaboration of this teleological design is offered in the manuscript. King dismissed the question by referring in the Introduction to two groups particularly interested in the distribution of wealth and income: reformers and sales managers. The former need to know the facts about inequality of wealth holdings and income receipts in order the better to carry out their social programs. The latter are anxious to know how wealth is distributed and income divided in order to gauge correctly the demand for their products

is replete with figures. It is to be expected that Doane would steer clear of such problems as redistribution by taxation, political stability, and social security, which engaged earlier students of the wealth question.

3 STATISTICAL ADEQUACY OF THE STUDIES

So far as statistical adequacy is concerned, all our inquiries have been impeded by a dearth of pertinent data. In addition each study has individual defects.

Holmes, relying on Census data of farm and home proprietorship, did not construct a frequency distribution of wealth holdings; he was content with noting, after the fashion of Lorenz curve analysis, the proportions of wealth held by given proportions of the population, and no rigorous accuracy for these figures was claimed. In general, Holmes' study presents only rough estimates of the general concentration of wealth holdings in the United States, and is not quite in the same class with the later studies.

a) *Spahr's weaknesses*

Spahr, by utilizing a method long popular in Europe, attempted to construct an actual frequency distribution of the wealth holdings for the entire United States. We have seen that he relied on probated estate records for New York State outside New York City and Brooklyn, and on certain Census farm mortgage data respecting the value of farms. In addition to his too free use of 'common observation' when statistics were either few or biased,³⁸ Spahr's analysis is open to the following objections:

1. It seems improbable that New York State outside of the metropolitan area was representative of the entire country, especially in 1890, with respect to the distribution of wealth. Not

³⁸ An oft-quoted statement from the Preface (p. v) of Spahr's book, follows: "The conclusions reached respecting the present distribution of property and incomes are in the main those which common observation has forced upon thoughtful men and women in the ordinary walks of life. The writer has learned, and hopes to teach, that, upon matters coming within its field, the common observation of common people is more trustworthy than the statistical investigations of the most unprejudiced experts. Indeed, he has come to believe that social statistics are only trustworthy when they show to the world at large what common observation shows to those personally familiar with the conditions described."

only was New York State one of the first to be colonized and settled, but it was also industrial while the states in the South and growing West were predominantly agricultural. The one link made to farm mortgage data³⁹ seems insufficient to compensate for this basic dissimilarity.

2. Even if the data for New York State were representative of the entire country, there is still the question of how closely a distribution of wealth among decedents represents the more realistic concept of the distribution of wealth among the 12,500,000 families in the United States. As mentioned above, this defect has long been recognized, for not only are many estates never filed for probate, but some of those which are filed have no inventories attached, considerable property is held jointly (e.g., by husband and wife), and gifts in anticipation of death are common. In addition there is a tendency to underestimate large estates for tax reasons and exaggerate small ones by failing to specify the debts. By adjusting the original data Spahr tried to overcome some of these defects, but not until King's first study was a systematic attempt made to correct for these errors.

3. As already pointed out, 'it is estimated' is the weak point in Spahr's entire analysis, and his resulting distribution of wealth was little more than a guess, bearing only general similarity to the probated estates data originally intended to be basic.

4. An identity was assumed between estates and families that is neither explained nor readily apparent.

5. Finally, no careful definition of wealth was attempted. The concept employed seems to involve both realty and personalty, while the chance that there might be overlapping between the two in his complete distribution was not mentioned. The total aggregate wealth actually allocated to the 12,500,000 families was apparently a Census estimate of the tangible property in the United States.⁴⁰

³⁹ I.e., his estimate that about one-eighth of the farms seemed to be worth more than \$5,000 each.

⁴⁰ According to the *Compendium of the Eleventh Census, 1890*, Part III, p. 94. "The true valuation of all tangible property in the United States, exclusive of Alaska, at the close of the Census period, 1890, amounted to \$65,037,091.197." No account is taken of "credit money, or of promissory notes, mortgages, or securities, although such items are frequently subject to ad valorem taxation" "True valuation" is construed to mean 'fair selling price'. Real estate constitutes two-thirds of

b) *King relatively satisfactory*

King, in both his studies, gave evidence of being a relatively thorough and careful statistician. Yet defects are present. In his book, *Wealth and Income*, he attempted partial coverage in his distribution, using probated estates data for Massachusetts and Wisconsin. Such records are open to the objections pointed out in connection with Spahr's study, while King's attempts to overcome some of the more obvious defects in these original data are questionable. He offers no justification for his maximum limit of \$500 assigned to non-probated estates of Massachusetts males who died when 25 years or older, and one wonders why he should have assigned an average value of \$375 to such estates in the first period studied and \$400 in each of the other two. A. A. Young has suggested as a further criticism of King's method that he should have allowed for the much greater inequality of possessions among men at the close of life than among men with a normal age distribution.⁴¹ Finally, even for Massachusetts, the distribution constitutes only a sample, since the 40 per cent of the estates filed without inventories were assumed to be distributed in the same proportions as the other 60 per cent. A similar criticism is applicable to all the distributions based on probated estates records.

King's second, more ambitious attempt to construct a distribution of wealth for the entire country was so inadequately explained in the published article that evaluation of it must have reference to the manuscript description. The use of probated estates data—the method King employed in his first 1921 distribution—has already been criticized. It need only be added that this \$65 billion total, with railroads ranking second. Other items listed are plant machinery and raw materials plus finished goods on hand, farm inventories including livestock, mines and quarries, gold and silver, and communications, shipping and canals. According to Part I of the *Compendium*, p. 856, the number of families is put at 12,690,152.

⁴¹ A. A. Young's review of King's *Wealth and Income*, *Quarterly Journal of Economics*, XXX (1916), 583. This criticism, while not obvious *a priori*, may be borne out by King's 1927 article in which the distribution of wealth among all the people of the United States in 1921 was shown to be less unequal than the distribution of wealth among decedents in twenty-four scattered counties during 1912-23 (p. 151). On the other hand, the method of constructing the 1921 distribution (on the basis of income classes) may have been such as to attenuate the inequality in the distribution.

the divergence among the distributions obtained by the different applications of this method—i.e., Massachusetts data of 1889-91 and King's two wealth distributions based on probated estates and described in the manuscript—does nothing to dispel the doubt cast over the results. The process of capitalizing income—King's second 1921 method—is likewise dangerous because the returns from different but monetarily equal units of capital vary greatly. Since two persons with the same income from capital may have widely different amounts of capital, it would seem that a distribution of wealth constructed by capitalizing income is essentially a distribution of income. Wealth holders are classified by income classes and the aggregate wealth is distributed among these wealth holders roughly in proportion to their incomes. Such results may give a general idea of the distribution of wealth; but as frequency distributions amenable to measurement and interpretation, they are obviously inadequate. In addition, this method required the assumption that the class of wealth holders is identical with the class of income recipients. Unless the wealth tally was sufficiently refined to register relatively minute holdings, it would seem that the latter class was larger than the former. Also, if capital losses were taken into account, it might well be that certain persons with wealth would still have no income. Finally, the assumptions required in utilizing the farm and income tax data were not only numerous but also arbitrary.

c) *Doane confusing*

Compared with Doane's construction of a distribution of wealth for 1932, King's statistical method is a model. Doane's analysis is more heavily documented, but not much more effectively, since certain page references are so general as to be virtually useless. Because Doane follows the principle that the real property of an individual is some multiple of his tax payments, he is open to a criticism similar to that inveighed against King: an average tax bill per unit of assessed valuation is bound to conceal variations that would alter radically the wealth holdings of individuals. Further, his method of passing from assessed valuation to real value is based on another general average derived from National Industrial Conference Board figures, and is open

to the same criticism of concealing significant variations among properties. Since not only assessed valuations but also tax rates may vary markedly from section to section, and among kinds of property within a section, such estimates of the distribution of real property are questionable. Doane's distribution of such personalty as securities, life insurance, and savings deposits has not only been found factually wanting by R. H. Jackson,⁴² but also involves the previously criticized principle of estimating wealth by capitalizing income. In general, it seems that Doane greatly exaggerated the number of holders of such personalty by failing to consider duplications arising from the fact that one person may hold stock in several companies, that many life insurance policies are industrial and others weekly (among wage earners, especially), and that a person may have life insurance policies and savings deposits in more than one institution. Moreover, Doane's resulting distribution of percentages explains neither how the number of wealth holders was estimated and distributed nor how the class interval of 'under \$5,000' was subdivided into four categories. Finally, Doane does not convert his 'wealth holdings by income classes' into the more consistent 'wealth holdings by wealth classes'. Doane's distribution resolves itself into a distribution of wealth arranged in the proportions in which income is distributed,⁴³ which is in turn made to follow the distribution of tax payments. Precisely what meaning such a distribution has is hazardous to predict.

In general, the statistical picture presented by these attempts to construct distributions of wealth holdings by size in the United States is as gloomy as the picture of our concentration of wealth itself is to some people. Not only is there a paucity of pertinent data, but (a) no decision has been made as to what constitutes wealth—what, that is, should be distributed among the individuals or families, (b) there is no agreement whether wealth distributions should be on the basis of individuals or families (or

⁴² *Annalist*, August 30, 1935, p. 292.

⁴³ This would deceptively show a greater diffusion through time (when compared with earlier distributions based on estates), for income is distributed more evenly than wealth because human skills and capacities are not included in wealth estimates.

estates),⁴⁴ and (c) there is some question as to the intrinsic usefulness of a distribution of wealth, when a distribution of income is contemporaneously available. King suggested as the chief merit of the former that it revealed the distribution of power and of security against emergencies. But it may also be argued that the distribution of income is equally revealing as to the distribution of economic power, and more important in certain tax problems, in analyses of savings and the velocity of money, in the problem of welfare from the subsistence and standard of living viewpoint, and in economic theory. The problem is complex, but it has yet to be proved that a distribution of wealth is of as great intrinsic value in the study of social problems as a distribution of income.

4 RECAPITULATION OF WEALTH DISTRIBUTION STUDIES

The salient characteristics of these earlier studies of the distribution of wealth can perhaps best be contrasted by an outline that emphasizes in summary form major points of similarity and difference.

NAME	DATE OF		BASIS OF ESTIMATE	UNIT	PURPOSE, REMARKS
	OPUS	DISTRI- BUTION			
G K Holmes	1893	1890	Tangible wealth, Census estimate	Census family	Social—suggested restrictive taxes, only outline of frequency distri- bution given.
C B. Spahr	1896	1890	Estates pro- bated in N Y. State	Estate Family	Social — taxation problem analyzed; perceived income distribution as vital.
W I King	1915	1860 1880 1890 1900	Estates pro- bated in Mass., and Lorenz estates data for six Wis. counties	Estate	Statistical. Com- plete coverage of U. S not attempt- ed. Income distri- bution more re- vealing.

⁴⁴ In addition, in those distributions among families, no attempt is made to refine the Census concept of what constitutes a family.

NAME	DATE OF OPUS	DISTRIBUTION	BASIS OF ESTIMATE	UNIT	PURPOSE, REMARKS
W I King	1927	1912- 1923	Federal Trade Commission (1926 Report) data on estates probated in 24 counties	Estate	Statistical, but links wealth dif- fusion with politi- cal stability. Not complete cover- age
		1921	Capitalize income	Property owners	Converted income classes into wealth classes, complete coverage claimed
		1928	The same	Entire population	For New York bank
R R Doane	1935	1932	Capitalize income and tax payments	Income receipts	Apologist for present wealth distribution Analysis decep- tive, confusing

* Published by W Tresckow in 1931

II American Studies of the Distribution of Income

1 HISTORY AND METHODS

Analysis of the distribution of income seems to have been secondary to, and certainly came later than, study of the distribution of wealth. Yet in discussion of social problems the former soon gained a significance not accorded the latter, and recent attempts to construct adequate distributions of income have been not only more numerous but also on the whole more successful than similar endeavors in the field of wealth distribution.

The problems encountered in constructing a distribution of income are similar to those faced in building a distribution of wealth. As before, there are two substantive elements: income and the receiving unit. The former has no single simple meaning. The money value of the total flow of economic goods emanating from wealth (both artificial and human) during a period such as a year is commonly referred to as national income, concerning which there is already a considerable body of academic literature, an imposing array of estimates, and an extensive

amount of government as well as public press discussion. But the total that is employed in constructing a distribution of income by size need not be, and for many problems should not be, the same as the total that is relevant as a comprehensive measure of the end-product of the economic system. The second element— income recipient—admits of as many definitions as the wealth-holding unit previously described.

As with wealth holdings, there has been no complete census of individual or family incomes in the United States. Therefore the problem is again one of raising a sample to universal coverage. It is chiefly in the nature of the samples, in the assumptions used in inflating them, and in the choice of income recipient that the various distributions of income differ.

a) *Spahr first to try*

As a sequel to his construction of the distribution of wealth, Spahr in 1896 essayed a distribution of income among families in the United States. There were four steps in his analysis.

Total national income was computed on the basis of Census returns and labor bureau reports of state and federal governments. Agricultural income was assumed equal to the 1889 value of farm product plus an estimate of the rental value of farm houses. Manufacturing income was derived from Massachusetts data on wages and profits, and from railroads and mines data in the Census reports. Service income was based on wages and profits in stores, while professional income was estimated from that of ministers and doctors. In estimating manufacturing and service income from wage rates (not earnings), average unemployment was allowed for in the following proportions: a dollar a day implied \$260 per year, while \$8 per week meant \$360 per year. Income from urban real estate was estimated at $6\frac{2}{3}$ per cent of its value. The total income, prior to taxation, of the 22,735,000 persons gainfully employed in 1890 was finally set at \$10,800,000,000.⁴⁵ This total was distributed among the 12,500,000 families in the United States.

⁴⁵ Spahr, *op. cit.*, Ch. V and VI, especially pp. 104, 105. This is more than a billion less than King's 1915 estimate of the national income in 1890 (see *Wealth and Income*, p. 132).

After enunciating the generalization that capital received two-fifths of the national income, and labor of all kinds the other three-fifths, Spahr declared that the 'safest guides' in the distribution of income by classes were the previously ascertained distribution of property, 'common observation' respecting the professional and business incomes of the wealthy and well-to-do, and Boston data on the distribution of rents.⁴⁶ On the basis of these guides, Spahr decided that the '\$50,000 and over' class of wealth holders corresponded to the '\$5,000 and over' class of income recipients, with the modification that 75,000 of the well-to-do families with possessions less than \$50,000 were also in the '\$5,000 and over' income category, thereby swelling the families in this group to 200,000. Similarly, the '\$50,000-\$5,000' class of wealth holders was assumed commensurate with the '\$5,000-\$1,200' class of income recipients. The above adjustment whereby 75,000 of the families in this well-to-do class were promoted to the '\$5,000 and over' category left 1,300,000 families in the well-to-do group. Thus far the wealth class intervals have been converted to income class intervals, and the number of families in each class redistributed.

The transfer of 75,000 families to the wealthy class was accompanied by an increase of \$2.5 billion in the wealth holdings of that group, while \$1 billion (representing household goods) were subtracted from this figure, leaving a total of \$34.5 billion. The wealth holdings of the well-to-do were reduced \$4 billion because of this family shift and on account of household goods, while the wealth of the poorer class was cut \$1.5 billion by the deduction of household goods. These classes therefore had left \$19 billion and \$7.5 billion, respectively. The return on this capital was estimated at 7 per cent for the wealthy and well-to-do classes, and 8 per cent for the poorer classes.⁴⁷

The final step was to estimate the average labor income of the families in each class. That for the wealthy classes was set at

⁴⁶ Spahr, *op cit*, pp 119-21. The reader is referred to Spahr's distribution of wealth presented in Sec. I, 1, b above, which is used as the starting point for the construction of his income distribution.

⁴⁷ *Ibid*, pp 125-8. No reason is given for the choice of these interest rates, and one wonders why the poor should enjoy a higher percentage return than the rich. Surely the poor are not better able to make wise and lucrative investments

\$3,500, for the well-to-do \$1,200, and for the poorer \$380, the last-named figure being a weighted average of an urban income of \$500 and a rural income of \$300. Although no precise method for estimating these averages is given, they are probably based on common observation, and made to jibe with the aforementioned dictum that labor of all kinds received three-fifths of the national income.

C. B. Spahr

DISTRIBUTION OF INCOME IN THE UNITED STATES, 1890 ⁴⁸

(PRIOR TO TAXATION)

FAMILY INCOME	FAMILIES (thousands)	AVERAGE INCOME,		PERCENTAGE RETURN ON CAPITAL	TOTAL INCOME (millions)
		LABOR	CAPITAL (millions)		
\$5,000 and over	200	\$3,500	\$34,500	7	\$3,110
5,000-1,200	1,300	1,200	19,000	7	2,890
Under \$1,200	11,000	380	7,500	8	4,800

It is possible to expand the resulting distribution, summarized in the accompanying table, by an added comment of Spahr's: "More than five-sixths of the income of the wealthiest class is received by the 125,000 richest families, while less than one-half of the income of the working-classes is received by the poorest 6,500,000 families." This statement has been introduced by the present writer into the foregoing table, and average family incomes computed, with the accompanying approximate results.

C. B. Spahr

EXPANDED DISTRIBUTION OF INCOME IN THE UNITED STATES, 1890

INCOME CLASS	FAMILIES (thousands)	AVERAGE INCOME	TOTAL INCOME
			(millions)
\$5,000 and over	{ 125	\$20,733	\$2,592
	{ 75		518
5,000 to 1,200	1,300	2,223	2,890
Under \$1,200	{ 4,500	354	2,500
	{ 6,500		2,300 ⁴⁹

A. J. Ferris, a Philadelphia writer with pronounced preconceptions, cast Spahr's income distribution, by a series of unexplained adjustments and assumptions, into a different form.

⁴⁸ *Ibid.*, p. 128.

⁴⁹ This allocation of "less than one-half" is arbitrary.

A. J. Ferris

APPROXIMATE DISTRIBUTION OF INCOME IN THE UNITED STATES⁵⁰
(PRESENT STATUS)

(INDIVIDUAL YEARLY INCOMES)

INCOME CLASS	PERSONS (thousands)	INCOME (millions)	AVERAGE INCOME
Under \$60	15,000	\$ 525	\$ 35
60— 125	35,000	2,975	85
125— 250	10,000	1,750	175
250— 750	3,500	1,625	450
750— 2,500	1,200	1,500	1,250
2,500—10,000	250	1,250	5,000
\$10,000 and over	50	775	15,500
All Income Classes	65,000	\$10,400	\$ 160

Ferris, in a note to this table, states: "The present classification into several divisions is an amplification of Dr. Spahr's, following the data given in his book when they cast any light on the subject, and for the rest simply based on probability and the analogy of the main classification. The results here given have been submitted to Dr. Spahr, and in their general features were approved by him." Because of the transition from a family to a person basis, it is hard to draw conclusions concerning differences in the shapes of Spahr's and Ferris' distributions. And since this transition—ordinarily a difficult and treacherous statistical job—is not explained, no judgment concerning its validity is possible. Confidence in Ferris' adjustments, however, is not encouraged by the nature of his proposal for alleviating the existing inequality in the distribution of incomes. Ferris would increase everyone's income by \$160, the approximate amount of the average income in 1890. Such a step, he reasons, would double prices, make each man's real income equal one-half of his former monetary income plus one-half of the \$160 average income, and thereby reduce those incomes above the average and increase those below the average. Such a naïve suggestion is typical of Ferris' book.

b) *Streightoff shied away*

A fine sense of caution, statistically, characterized the next student of the problem, F. H. Streightoff. In his 1912 study of the

⁵⁰ A. J. Ferris, *Pauperizing the Rich* (Philadelphia, 1899), tabulation facing p. 192 'Present Status' presumably refers to 1890, or shortly thereafter

Distribution of Incomes in the United States,⁵¹ he was concerned primarily with pointing out the utility of income statistics, the available American data on incomes, and their insufficiency for the construction of a complete distribution of income. He tried to derive the distribution of income from property, but finally concluded: (a) the number of persons receiving income from capital is large but unknown, (b) the total national income from capital cannot be accurately determined, (c) the distribution of income from property is a futile quest. Although he realized that value of farm product was not equal to net farm income, and that wage rates were not distributed in the same fashion as earnings, Streightoff did employ such figures to construct a "distribution of incomes primarily from labor". His principal sources were the *Eighteenth Annual Report* of the Commissioner of Labor (1903), the *Censuses of Mines and Quarries* (1902), of *Manufactures* (1905), and of *Agriculture* (1900), *Kansas Bureau of Labor Reports* (1903-07), and the *Annual Minutes* of ten typical Methodist Episcopal Church conferences (1910). His resulting table distributed among three income classes the 19,658,000 males 16 years and older gainfully occupied in the United States in 1904, including industrial workers, ministers, agricultural laborers, and heads of farm families. Since neither the income received by each class nor by the total group was estimated, a frequency distribution in Lorenz curve form of Streightoff's results is not practicable.

c) *King again the pioneer*

As in the field of wealth distribution, so in that of income distribution, W. I. King did the pioneer work as far as statistical adequacy is concerned. In his 1915 study he agreed with Streightoff "that it is, at present, impossible to give any accurate picture of the distribution of incomes among the population as a whole."⁵² However, he had some Wisconsin income tax data not available to Streightoff, so he attempted "to classify roughly the twenty-eight millions of families living in the Continental United States according to the income which each, respectively,

⁵¹ *Columbia University Studies*, Vol. III, No. 2 (New York, 1912), especially pp. 46-56, 137, 150.

⁵² *Wealth and Income*, p. 219.

receives.”⁵³ King took as granted that “any classification of income must, necessarily, be based upon receipt of families rather than individuals for it is by families that incomes are received and disbursed”.⁵⁴ Although the methods followed by King in constructing his distribution of income among families in 1910 “were mainly graphic and were too varied to describe here”,⁵⁵ they may be grouped into three divisions.

Wisconsin income tax data compiled by H. M. Trumbower were used to solve the question of how middle class incomes were distributed. Wisconsin was considered a “peculiarly good sample state” with a per capita wealth “about equal to the average for the United States as a whole”. Therefore, the central part of the curve for Wisconsin was considered “fairly representative for the middle class throughout the entire nation”.⁵⁶

The incomes of the wealthy were inferred from United States Treasury Department and Congressional estimates of the incomes of the very rich in certain metropolitan centers in the East, and from preliminary reports on the federal income tax.

Lower class incomes were estimated on the basis of Census data, reports of the United States Commissioner of Labor, and investigations by the bureaus of labor of the various states. These were supplemented by private studies of workingmen's budgets.

The results of these three methods were combined in an unexplained fashion to give “The Estimated Distribution of Income among the Families of the Continental United States in 1910”.⁵⁷ The fifty class intervals included family incomes between \$0 and \$50,000,000. For incomes under \$1,400 the recipients were classified as ‘single men’, ‘single women’, and ‘men or widows with families’; for incomes over \$1,400 the only unit of income recipient was the family.

No explanation of how King estimated the \$30,529,000,000 of national income distributed in the foregoing fashion among the 28,000,000 families is attempted here, primarily because, with King and his successors, the problem of estimating the total na-

⁵³ *Ibid*, p. 217

⁵⁴ *Ibid*, p. 222.

⁵⁵ *Ibid*, p. 221

⁵⁶ *Ibid*, p. 220

⁵⁷ *Ibid.*, pp 224-6.

tional product was of prime, not secondary importance.⁵⁸ Spahr and Streightoff considered the derivation of the national income as a means to an end, the goal being the family or individual distribution of this product. Since Streightoff, an accurate formulation of the value of our national output of economic goods has been emphasized as an end in itself. The development of the latter technique is outside the scope of this paper, so in discussing King and subsequent writers, the national income total to be divided among the individual claimants will be considered given data.

d) *Macaulay's distribution for 1918*

The first publication of the National Bureau of Economic Research was a two volume study, *Income in the United States*.⁵⁹ As a collaborator in this work F. R. Macaulay made a thorough analysis of the frequency distribution of annual income among personal income recipients in the United States in 1918.⁶⁰ Income was defined to be money income plus those items of commodity income on which a money value is placed, such as rental value of owned houses and value of farm produce consumed by farmers' families.⁶¹ Income recipient was taken to be the individual and not the family because (a) it is the individual who comes into direct economic relationship with the machinery of distribution, and (b) use of families still leaves unsolved the question whether to employ theoretical families, biological families, or families expressed in a need-unit such as the 'ammain'.⁶²

⁵⁸ King does not state specifically whether his concept of income includes capital gains and losses. From his methods and sources, however, one gathers that it does not.

⁵⁹ W. C. Mitchell, W. I. King, F. R. Macaulay, and O. W. Knauth, Vol. I (1921), summary, and Vol. II (1922), details.

⁶⁰ *Ibid.*, II, 341-425.

⁶¹ Income is defined to include also statutory capital gains and losses, since these were apparently not extracted from the income tax data before building up the tail of the distribution.

⁶² *Ibid.*, II, 341, 342. Macaulay does not deny that the family is the chief unit of economic need. He apparently takes the term 'ammain' from an article by Edgar Sydenstricker and W. I. King, 'The Measurement of the Relative Economic Status of Families', *Journal of the American Statistical Association*, XVII (1921), 842-57.

The total income estimated by the National Bureau was distributed, before deduction for taxes, among all who had money income as follows: ⁶³

1. Income tax data, unusually complete for 1918, were adjusted to include (a) farmers and small business men who filed no returns, (b) evasion by reporting persons, (c) non-monetary income referred to above, (d) income from tax-exempt securities.

2. O. W. Knauth's distribution of incomes above and below \$2,000, another part of this National Bureau study, was used as a check on Macaulay's distribution.

3. Incomes under \$2,000, inadequately covered by income tax statistics, were estimated in an unexplained fashion on the basis of wage distributions, small samples of farmers' incomes, and other studies such as A. T. Emery's unpublished sample of Chicago incomes.

4. Since some business men incur net losses, Macaulay estimated the number and amount of these negative incomes, and spread them in some manner throughout the distribution.

5. The final frequency curve was smoothed on the assumption that, even though the distribution of income followed no mathematical law, ⁶⁴ nevertheless it would not be bimodal and 'bumpy'.

The final distribution was presented with small class intervals ranging from 'under zero' to '\$4,000,000 and over'. The 2,500,000 soldiers, sailors, and marines in 1918 were excluded from the number of income recipients on the assumption that in peacetime their incomes would be distributed similarly to those of the others.

e) *King a prolific contributor*

Before the publication of the next major work in this field by the Brookings Institution in 1934, a dozen years passed marked by

⁶³ Mitchell, King, Macaulay, and Knauth, *op. cit.*, I, 124-6 "Personal income recipient" here corresponds "closely to the Census expression person gainfully employed . . . Perhaps the most important difference is that we do not, and the Census does include as separate income recipients, farm laborers working on the home farm" (*Ibid.*, II, 342n) But what about those persons who, although not 'gainfully employed', are nevertheless in receipt of income (e.g., from property)?

⁶⁴ His examination of Pareto's famous law led him to this conclusion, *ibid.*, II, 393, 394.

increasing interest in the interpretation of income distributions, especially by consumption economists and marketing students.⁶⁵ Meanwhile King worked out two complete distributions of income among individuals, one for 1921 and another for 1928, and attempted to trace annual changes in the distribution of income for 1914-26.

A distribution of personal incomes in 1921, comprising 32 class intervals from \$0 to \$1,000,000, was made at the National Bureau of Economic Research by King, left unpublished, and in 1934 utilized in percentage form by Maurice Leven in *America's Capacity to Consume*.⁶⁶ No details whatsoever were given by Leven as to how this distribution had been constructed, but the circumstances surrounding the 1921 distribution have already been set forth (above, footnote 18), and examination of the unpublished manuscript describing its construction reveals that the work fell into four stages. First King derived the distribution of earnings among employees; then he distributed the income of farmers; the third step was to find the income distribution of non-farm entrepreneurs and income recipients not gainfully employed; and the final stage was to combine these distributions into one of income among all classes. Each step will be described in turn.

Employees were construed to be not only wage earners but also salaried workers, including highly paid executives. Of the \$34.3 billion 1921 wage and salary bill, \$22.7 billion went to the former (23,602,469 persons) and \$11.6 billion to the latter (7,137,531 persons). This was allocated by means of sample wage distributions for earnings under \$2,000 and *Statistics of Income* data for earnings over \$2,000. The final earnings distribution was a composite of 132 sample distributions (weighted according to importance and adjusted to 1921 conditions) for the lower classes

⁶⁵ E.g., Hazel Kyrk, *A Theory of Consumption* (Boston, 1923), E. E. Hoyt, *The Consumption of Wealth* (New York, 1928), W. C. Waite, *Economics of Consumption* (New York, 1928) and P. H. Nystrom, *Economic Principles of Consumption* (New York, 1929).

⁶⁶ Maurice Leven, H. G. Moulton, and Clark Warburton (Brookings Institution, 1934), pp. 177, 182-4. Leven derived 1929 equivalents from the 1921 figures in order to provide a check on his own computation of a distribution of income for 1929. It could constitute such a check, it should be noted, only to the extent that the inequality in the income distribution had not changed from 1921 to 1929.

and of *Statistics of Income* frequencies for the higher ranges. After constructing this distribution, King proceeded to break it down by sex and industry. He also ventured an *obiter dictum*: inequality is not due solely to income from property; earnings themselves are decidedly unequal, not only at the extremes but all along the earnings scale.

The Bureau of Agricultural Economics constructed a distribution of income among a sample of farm crop reporters in 1922 which formed the basis of King's distribution of income among farmers in 1921. This sample curve was adjusted so that an income total computed on the basis of its shape would correspond with the farm income totals derived by the National Bureau of Economic Research. Current money income was first distributed according to the crop reporter sample. Current money income was then supplemented by imputed interest on consumption goods owned, to give entire or total current income. Current money income was also supplemented by the value of commodities produced and consumed on the farm, to give current money and commodity income. Finally, this was corrected for changes in the value of property owned (i.e., unrealized capital gains and losses), to give total money and commodity income. This last adjustment was of no mean proportions: an entire current money and commodity income of \$4.4 billion was slashed to a total money and commodity income of \$2.4 billion. This \$2 billion decline represents the diminution in the command over consumption goods of the sum of money representing the value of farm property. King argued that this was a real not a nominal loss. This total money and commodity income was distributed in two distinct fashions, and the resulting distributions combined by simple averaging. In the first, the 1922 crop reporter curve was adjusted to fit the revised income total. In the second, the distribution of current money income, itself based on the crop reporter sample, was used as a datum from which was subtracted (or added) the total losses (or gains) of farmers arising from changes in the value of their farms, livestock, machinery, etc., as given by the Census. This process assumed that those farmers possessing the most property suffered the heaviest property losses when farm prices fell. The average of these two distributions of total money and commodity income was supplemented by im-

puted interest on consumption goods owned to form the final distribution of total income of farmers (including commodity income and imputed interest).

Having estimated the earnings of employees and of farmers, King proceeded to distribute the remaining income among those persons who were neither employees nor farmers, i.e., the non-farm entrepreneurial group. The incomes of those in this group receiving less than \$2,000 were assumed to be distributed similarly to the earnings of employees. The incomes of those above the \$2,000 scale were distributed by *Statistics of Income* tables. Once the current money income was distributed, King next corrected for changes (measured by consumption goods prices) in the value of property held by persons in each income class, in order to get total income.⁶⁷ The distribution of dividends, interest, and rents, as revealed by *Statistics of Income*, was used as a basis for apportioning gains in the value of property. The final adjustment of this distribution among non-farmers was for negative incomes. This was done by "the device of drawing a smooth histogram through the records of persons having positive incomes and extending the same free-hand into the negative side of the field". The statistical manipulations involved in this third stage of the income distribution analysis were exceedingly complicated and oftentimes quite arbitrary.

The synthesis of King's analysis appears in the last chapter of the section dealing with income. Here he combined the three distributions arrived at in the preceding steps, and got a series of distributions for all the income recipients in the United States, based successively on (a) current money income, (b) current money and commodity income, (c) total current income (including imputed income from consumption goods owned), (d) total income (including gains or losses in the value of property owned, i.e., unrealized capital gains and losses). These distributions, in the order named, acquired an increasingly comprehensive concept of income. The final one, i.e., of total income (d), is preferred, said King, if one views the subject of income distribution from a "technical financial standpoint". The monograph con-

⁶⁷ Thus total income includes not only realized capital gains and losses (already comprehended by current money income), but also unrealized capital gains and losses.

cluded with a Lorenz curve comparison of King's total income and current income distributions with Macaulay's 1918 distribution. The inequality thus indicated decreased in passing from one to the next of these distributions in the order listed.

The second of these distributions of King's, among individuals in 1928, has had a curious history. Never published by King, it was taken over by Leven, converted to a family basis, and incorporated in *The Ability to Pay for Medical Care*.⁶⁸ It was then seized upon by Louis Bader who condensed it from twelve to five class intervals, computed the percentages of families and incomes in each category, applied these percentages to the total number of families and amount of income in 1932, and then analyzed what happened to family expenditures from prosperity to depression.⁶⁹ This work posited that the 1932 national income was distributed in dollars in the same way as in 1928, which Bader claimed to be "a fair assumption since all income groups have suffered, due to decreases in all forms of income".⁷⁰ Although this assumption may be legitimate for Bader's purposes, it begs the question generally asked—Does inequality of income distribution change from prosperity to depression?—so this survey will ignore the 1932 distribution, and consider only the source from which it was derived.

King's estimate of the distribution of individual income recipients according to amount of annual income in 1928 was originally constructed for the Central Hanover Bank and Trust Company of New York. No details concerning the statistical devices utilized in its synthesis have been published, although King, in a personal letter to the present writer, states it was made along lines similar to his 1921 estimate except that "the figures for the lower income classes are . . . merely rough approximations" since his sponsor "was not interested in the distribution in the lower brackets".⁷¹ Leven, then on the staff of the Committee on the Costs of Medical Care, used it to derive an estimated distribution of families according to annual income in 1928. The work

⁶⁸ L. S. Reed, *The Ability to Pay for Medical Care* (Committee on the Costs of Medical Care, University of Chicago Press, 1933), pp. 10, 11.

⁶⁹ 'The American Family Income and Prosperity', *Journal of the American Statistical Association*, XXVIII (1933), 303-11.

⁷⁰ *Ibid.*, p. 305.

⁷¹ Letter dated April 4, 1938.

done by Leven in making this conversion seems to have been a testing ground for the procedure he later employed in the Brookings study. On the basis of the then incomplete 1930 Census returns, Leven estimated ⁷² the number of families with one gainful worker, with two, three, and four gainful workers. These gainful workers were broadly classified into main breadwinners and supplementary earners, the latter group composed largely of gainful workers under the age of twenty. The problem then became one of breaking up King's distribution of individual income recipients and recombining the component parts into family units. The first step in this process was to divide the individual income recipients into supplementary earners and chief breadwinners. This was done by assuming that (a) all persons under twenty were additional earners in families headed by others, (b) their incomes were all under \$1,200, (c) most of the female workers were supplementary income recipients, and (d) their incomes were distributed according to certain data collected by Leven in a New York City survey.⁷³ The residual distribution resulting from subtracting minors and females from King's distribution was taken to represent chief breadwinners and persons living independently outside family units. The incomes of this second group were assumed to be distributed in the same manner as those of main breadwinners. Leven's second step was to allocate the supplementary earners to the families having such members. The procedure was expressed thus: "the income of each head of family in a given income class was combined with the income of a supplementary earner picked in accordance with the probability represented by the supplementary earner's income curve". This required the assumption "that the probability of a main breadwinner being associated with a supplementary earner of a given income was the same for all incomes of the main breadwinners, and that this probability is represented by the income distribution of the supplementary earners".

Although the use of the word 'probability' here is a little confusing if one tries to attach a technical mathematical meaning to

⁷² 'Note on the Distribution of Income', Appendix A of Reed, *op. cit.*, pp. 99-101.

⁷³ Maurice Leven, *The Incomes of Physicians* (Committee on the Costs of Medical Care, University of Chicago Press, 1932), p. 127.

it, a conceivable interpretation of Leven's description would imply the following procedure. Assume income distributions:

OF BREADWINNERS IN FAMILIES HAVING ONE SUPPLEMENTARY EARNER		OF SUPPLEMENTARY EARNERS		
INCOME CLASS	NUMBER	INCOME CLASS	NUMBER	PERCENTAGE
0-\$500	100	0-\$500	300	50
500-1,000	150	500-1,000	180	30
1,000-1,500	200	1,000-1,500	120	20
1,500-2,000	150			

Under this interpretation, Leven allotted (a) supplementary earners in the 0-\$500 class to 50 per cent of the breadwinners in each income class, (b) supplementary earners in the \$500-\$1,000 class to 30 per cent of the breadwinners in each income class, and (c) supplementary earners in the \$1,000-\$1,500 class to the remaining 20 per cent of the breadwinners in each income class.⁷⁴

The final distribution obtained in this manner is the sum of the income frequencies of the several groups of families. It also includes families without gainful workers, allocated a \$1,200 income.

Abandoning for the moment his elaborate statistical devices for deriving a complete distribution of income, King in 1930 used *Statistics of Income* data and the Census figures for gainfully employed to derive truncated distributions of income for 1914-26.⁷⁵ The distribution of income recipients above \$5,000 was taken directly from *Statistics of Income* for each year, while the rest of the gainfully employed were put in the 'under \$5,000' category. All distributions were reduced to 1913 dollars by means of indices of the average prices of consumption goods used by different income classes of the population. Such an analysis of

⁷⁴ This illustration requires explanation in at least two points. First, supplementary earners are 'allotted' to the main breadwinners by shifting the income curve of the main breadwinners to the right by an amount equal to the average income of the supplementary earners in each income class. Second, the present illustration relates to merely one set of supplementary earners, e.g., those in families with only one supplementary earner. A similar process would have to be gone through again in the case of families with two supplementary earners, three, etc. This explains why the number of supplementary earners was taken equal to the number of breadwinners in the illustration.

⁷⁵ *The National Income and Its Purchasing Power* (National Bureau of Economic Research, New York, 1930), Ch. VII.

Statistics of Income data is really not a construction of a complete distribution of income by size, as we have been using the term, for the 'under \$5,000' class comprising an overwhelming majority (about 97 per cent) of the income recipients was not subdivided. Furthermore, no account seems to have been taken of those without gainful employment who were nevertheless in receipt of income. Other students have made similar partial analyses. For example, W. L. Crum applied Pareto's graphic method to *Statistics of Income* data without any attempt to construct the distribution of income below the income tax exemption point.⁷⁶ The Pareto slopes he computed, therefore, applied only to the tail of the distributions. N. O. Johnson, in a defense of Pareto's thesis, made a similar study of inequality in the upper brackets.⁷⁷ And M. A. Copeland analyzed, on the basis of federal income tax data, the problem of inequality from a different angle, namely, per capita income, and per cent of total income received by the wealthiest 10 per cent of income recipients.⁷⁸

f) *Leven's distribution*

A widely publicized attempt to construct a distribution of income by size for the United States was made by the Brookings Institution in 1934 as an integral part of the second volume in its study of the distribution of wealth and income in relation to economic progress. Leven, in charge of this part of the study, constructed a comprehensive distribution of income among families for 1929, which comprised twenty-seven class intervals from "under \$0" to '\$500,000 and over'. The method followed was long and involved, and only its outline can be sketched here.⁷⁹ Leven first converted Macaulay's estimate for 1918 and King's unpublished figures for 1921 into 1929 equivalents, and then used these two distributions as checks upon his own independent construction of the distribution of income among individuals in

⁷⁶ 'Individual Shares in the National Income', *Review of Economic Statistics*, XVII (1935), 116-30.

⁷⁷ 'The Pareto Law', *Review of Economic Statistics*, XIX (1937), 20-6.

⁷⁸ 'The National Income and Its Distribution', *Recent Economic Changes* (National Bureau of Economic Research, 1929), II, 757-839; see especially pp 833-7.

⁷⁹ The final distribution is presented in Leven, Moulton, and Warburton, *op. cit.*, p. 54. The calculations are presented and methods explained in Ap. A, 'Income and Its Distribution', pp. 137-238.

1929.⁸⁰ Leven's independent estimate was arrived at roughly as follows:

Earnings were distributed among gainfully employed non-farmers on the basis of federal income tax statistics and various sample distributions weighted by their importance and adapted to 1929 conditions. This distribution was adjusted so that aggregate earned income equaled the Department of Commerce estimate of total occupational income for 1929. It was then converted into one of total income by the use of previously ascertained ratios of total income to occupational income. Finally, to this distribution was added the estimated distribution of income recipients without a gainful occupation. In making this union it was assumed that "the distribution of those without gainful occupations was like that of the individuals with gainful occupations".⁸¹

For farmers, the first task was to estimate total income, and then distribute this total. Net farm income was derived from Department of Agriculture figures, and the distribution was made on the basis of (a) Census figures of 'Value of Farm Products' for individual farms, and (b) samples that showed the relation between gross and net income of individual farmers.

The distributions for non-farmers and farmers were apparently added to give the final distribution of personal incomes in 1929. The next step was the conversion of this distribution among persons into one among families. In an unexplained fashion the personal distributions of farm and non-farm incomes (treated separately) were each broken down into a threefold frequency distribution of personal incomes (a) for all heads of families of two or more persons, (b) for supplementary income recipients, (c) for unattached individuals. Parts (a) and (b) were then combined to make a distribution of family incomes. The distribution of families with only one income recipient followed readily from the assumption that its form was the same as that of heads of families having any specified number of supplementary earners (i.e., each frequency in part (a) was multiplied by the ratio of the total number of families with one income recipient

⁸⁰ *Ibid.*, pp. 177-84. It has already been noted that the utility of such a check varies directly with the stability of income inequality between those years.

⁸¹ *Ibid.*, pp. 185, 186.

to the total number of all families). "The residual frequencies, obtained by subtracting the distribution of one income families, constituted the distribution of principal incomes in families of two or more income recipients."⁸² To this Leven added an equal number of supplementary incomes (part (b) above) to obtain the combined distribution of the first two income recipients. This was divided in an unexplained way into families having two income recipients and families having more than two. The latter distribution was adjusted to include a third income recipient for each family, and the process was repeated until distributions for all five groups were set up.

All this may seem complex, but the complications are not yet at an end. Families with more than one income recipient were distributed over the income classes in the same proportions in which the supplementary incomes were distributed; then the distribution curve of principal incomes was shifted to the right along the income scale by amounts equal, for each class interval, to the corresponding class average of the supplementary incomes. The several distributions thus obtained were plotted as cumulative curves and then added to give a composite distribution incorporating families with one and two income recipients. A similar process was employed in combining the third, fourth, and fifth income recipients with the basic distribution. All this mathematical juggling was used only for incomes under \$15,000; families with incomes over \$15,000 were assumed to be distributed proportionately to principal incomes.⁸³

In the end we have a distribution of income by theoretical families of two or more persons, with capital gains and losses included in the concept of income, and with the twenty-seven class intervals ranging from 'under \$0' to '\$500,000 and over'.

g) *Tucker on inequality*

Two major contributions have been made very recently to the study of the distribution of income by size—one by R. S. Tucker, another by the National Resources Committee. The first ap-

⁸² *Ibid.*, p. 224.

⁸³ *Ibid.*, p. 226. The assumptions implicit in Leven's analysis are effectively singled out by A. F. Burns, in 'The Brookings Inquiry', *Quarterly Journal of Economics*, L (1936), 495, 496.

peared in the August 1938 issue of the *Quarterly Journal of Economics*⁸⁴ It is limited to income tax data, and therefore would have been accorded, in this report, space similar to that given the Pareto analyses of King, Johnson, and Crum were Tucker's article not distinguished from these predecessors in several respects. In the first place, Tucker attempts to carry the picture back to the Civil War. Second, his analysis of the existing income tax data is relatively intensive, several measures of inequality other than the Pareto slopes being used. And finally, he boldly asserts as an introductory thesis that changes in the income distribution of the well-to-do indicate what is probably happening to the rest of the distribution, since the two ratios of (a) income of the wealthy to income of the middle class, and (b) income of taxpayers to income of non-taxpayers, are approximately identical.

Tucker differentiates three concepts of income: legal income, which conforms to the statutory definition of income, with such adjustments as are necessary to maintain comparability; spending power, which equals legal income plus tax exempt interest minus the income tax paid; earning power, which equals legal income minus realized capital gains plus realized capital losses plus tax-exempt interest plus gifts, charitable contributions, and the like.

Statistics of Income data for 1914-36 are analyzed by means of five measures of dispersion. The first two are Pareto slopes, one referring to the number of persons and the other to amount of income, each being taken above the \$5,000 income level and cumulated by income class from top to bottom. The third measure is the arithmetic average of all incomes above \$5,000. If \$5,000 is taken as the modal income, comparison of this average with \$5,000 suggests the skewness in the distribution. The fourth indicator is one apparently introduced by Hans Staehle⁸⁵ and is the ratio of the cumulative median income (the income such that

⁸⁴ 'The Distribution of Income among Income Taxpayers in the United States, 1863-1935', *Quarterly Journal of Economics*, LII (1938), 547-87

⁸⁵ 'Short-Period Variations in the Distribution of Income', *Review of Economic Statistics*, XIX (1937), 133-43 (Cited by Tucker) This measure was foreshadowed by Holmes ('Measures of Distribution', *Publications of the American Statistical Association*, III (1892-93), 141-57) who suggested using the difference between the median lines for wealth owned and for number of wealth owners.

individuals with greater incomes receive fifty per cent of the total income) minus the median income to the cumulative median for all incomes above \$5,000. Its lower limit, 0 per cent, is absolute equality, and its upper limit, 100 per cent, implies that all the income is received by the upper half of the income recipients in the group. The picture painted by these four measures is checked by a composite indicator comprising the 'earning power' income received by all taxpayers (above the \$5,000 level) minus income taxes paid, divided by national income paid out. The results of applying these various measures to the different concepts of income led Tucker to the belief that there has been an increased diffusion of income over the twenty-three years studied. Therefore he next addressed himself to the question, how long has this increasing diffusion been going on?

The income tax law of 1894 yielded scanty data with which to essay an answer to this question, because it was declared unconstitutional before it became fully effective. The Civil War income tax laws, however, yielded official published statistics which when supplemented by various private lists⁸⁶ made it possible for Tucker to employ two of the aforementioned measures of concentration: the first, referring Pareto slopes to number of recipients, and the third, being the arithmetic average of incomes above \$2,000 and then above \$3,000. The results of this analysis, together with the fact that reportable income in the 1860's did not include interest and dividends from public companies and from government bonds, or certain realized capital gains (items which normally accrue to the wealthy and whose exclusion would therefore understate the concentration of in-

⁸⁶ Tucker cites J. A. Hill, 'The Civil War Income Tax', *Quarterly Journal of Economics*, VIII (1894), 416-52, 491-8, for general information on these Civil War data. The two private lists cited are *Income Record* (New York, 1865) and *Income Tax of Residents of Philadelphia* (Philadelphia, 1867). Another that he failed to cite is *Income Tax of Residents of Philadelphia and Bucks County* (Philadelphia, 1865). All these tax lists are anonymous. The first gives the taxable income for 1863 of every resident of New York. Unlike the other lists, this one contains a 'Publisher's Preface' which discusses such topics as the practical significance of a distribution of incomes, the English income tax, and tax evasion (estimated at not more than 10 per cent). The second list describes 'The Rich Men of Philadelphia' by size of income in 1865 and in 1866, and is based on the latest returns filed by August 1867. The third list classifies the same personages by size of income for the year ending April 30, 1865.

come), led Tucker to the belief that incomes were less concentrated since 1916 than in Civil War days. Tucker concludes his analysis with a brief survey of the shifting composition of the wealthy group. He reviews the results of three studies that have been made of this problem:

1. 'Investigation of Bureau of Internal Revenue', *Senate Report* no. 27, 69th Congress, 1st Session, Part 2. This traces 6,633 individuals with incomes over \$100,000 in 1916.

2. Edward White, 'Income Fluctuation of a Selected Group of Personal Returns', *Journal of the American Statistical Association*, XVIII (1922), 67-81. The 1,636 individuals or estates with incomes over \$300,000 in any of the years 1914-19 are traced.

3. Bureau of Internal Revenue, *Statistics of Income*, 1922 (Washington, 1925), pp. 11-15. This follows the fortunes of 1,296 individuals with incomes over \$300,000 in any of the years 1916-22.

These studies all indicate, Tucker avers, that persons in "the upper income classes have been a very shifting group",⁸⁷ although some of this shifting after 1916 may have been due to sharing of taxpayer's property with wives and children in an effort to qualify in the lower tax brackets.

Unlike most of the other income distribution studies whose works we have examined in this paper, Tucker winds up his contribution with several general conclusions. In the first place, fluctuation in the concentration of wealth, during the business cycle, is less than in the concentration of income. Second, the concentration of income increases during prosperity and decreases during depression. Third, the size of the national income is the important consideration. Fourth, bank reforms are needed "to prevent excessive use of credit". And finally, the question is not how large are incomes, but whether they are the result of activities beneficial or harmful to the nation.⁸⁸

⁸⁷ Tucker, *op cit*, p 583. It is significant to note, however, that he seems to take no account of deaths among these taxpayers. Surely a fair number left the picture for that reason.

⁸⁸ *Ibid*, pp. 585-7.

h) *Family incomes in 1935-1936*

The combination of a large new sample of family incomes and the interest of a government agency in the income distribution problem have resulted in the most reliable as well as the most recent distribution of income—that presented in the report of the National Resources Committee, entitled *Consumer Incomes in the United States, Their Distribution in 1935-36*, prepared by Hildegard Kneeland and her staff, and dated May 27, 1938. The Study of Consumer Purchases, a Works Progress Administration project conducted by the Bureau of Home Economics and the Bureau of Labor Statistics, with the cooperation of the National Resources Committee and the Central Statistical Board, was a nationwide canvass of 300,000 families that provided not only the initial impetus but also the basic material for this latest distribution of income.

The National Resources Committee report may be divided into three sections: a 36-page summary, a detailed appendix on 'Sources and Methods Used in the Study', and a concluding compendium of 'Statistical Tables for Reference Use'. Although the distribution is largely grounded on the Consumer Purchases data, other samples for single men and women, earnings figures and federal income tax statistics were used. Since the Consumer Purchases Study covered family incomes for a year ending between December 1935 and December 1936, the National Resources Committee distribution is taken to refer to the year ending June 30, 1936, the period covered by the majority of the schedules. Comprehended by the distribution are 29,000,000 families of two or more persons, 10,000,000 single individuals living alone or as lodgers. Classified separately are 2,000,000 persons living in institutional or semi-institutional groups.

As a first step, the Consumer Purchases data were divided into 729 homogeneous family groups—homogeneous in respect of size and occupation of family,⁸⁹ relief status,⁹⁰ color and nativity, size of community, and geographical region. All families in the

⁸⁹ A family's occupation was determined on the basis of the source from which the family received the largest amount of income.

⁹⁰ Relief families were segregated and considered separately, since they could not be classified into as many homogeneous groups as the other families.

United States were similarly split up by means of Census returns, and the percentage distribution (by size of income) of each segment in the Consumer Purchases sample was applied to the corresponding segment of the 29,000,000 families. These components were supplemented by means of federal income tax data for incomes over \$7,500, after which the parts were summated to give the estimated national distribution of family incomes. 'Income' in this part of the study includes both money and non-money income, net after business expenses and business taxes, but before income, poll, and sales taxes. Federal income tax data, used to construct the tail of the component distribution, were first adjusted by removing capital gains, by adding interest paid, capital losses, taxes, contributions, and tax-exempt interest received, by combining separate returns of husbands and wives, and by making allowance for understatement and non-reporting of income.

The number of families in each income class above \$7,500 was derived wholly from income tax data. This distribution was then tacked bodily onto the distribution based on Consumer Purchases data. Since the population weights used in constructing the latter distribution had accounted for all families in the United States, the addition of the income tax 'tail' resulted in an overstatement of the number of families. In a manner that left unchanged the shape of the distribution, this excess number of families was subtracted from the income classes under the \$7,500 level.⁹¹ The resulting distribution contains twenty-eight income classes ranging from 'under \$250' to '\$1,000,000 and over'.

The distribution for single individuals was built up by means of a more tenuous procedure and is therefore less reliable. The distribution for non-relief single women is based largely on data resulting from studies by the United States Women's Bureau and the United States Employment Service. The distribution of non-relief single men was derived from this distribution of non-

⁹¹ *Consumer Incomes in the United States*, pp. 85, 86. For a given income class, the percentage that the number of families in that class bore to the total number of families with income less than \$7,500 was applied to the number of 'extra' families, and the resulting product subtracted from the number of families in the given class. By this procedure the percentages of families in each class under \$7,500 were left unchanged; the number of families in each class had been reduced proportionately to the frequency of that class.

relief single women by using the relationship known from various studies to exist between earnings of men and women. These two distributions were then checked by small samples from the Consumer Purchases Study and the National Health Survey. For single individuals who received relief at some time during the year, fragmentary Works Progress Administration data and certain assumed relationships between incomes of relief and non-relief individuals were employed. The distributions for relief and non-relief individuals were then combined to give a composite distribution for single persons. This series of frequencies was also supplemented, above the \$3,000 income level, by federal income tax data. The income class intervals are identical with those in the family distribution.

Institutional residents presented difficulties not raised by either families or single individuals, since much of their income is in the form of food, clothing, and shelter provided through a central commissary. Civilian Conservation Corps incomes were distributed with the help of data supplied by the Director. Enrolees were credited only with that portion of their monetary income not sent home to their parents. Incomes of Army and Navy personnel were distributed by means of data embodied in pertinent Congressional Committee hearings. A combination of these two distributions—Civilian Conservation Corps and Army and Navy—was made and the resulting percentage frequencies applied to incomes of workers in labor camps and crews on vessels. For the other institutional residents, reports of various state welfare departments were used in devising the distribution. Such residents were assumed to have incomes equal to average subsistence costs, exclusive of administrative overhead and capital outlays. No composite distribution for institutional residents is presented because the institutional group rather than the constituent thereof makes up the spending unit. For the same reason the incomes of institutional residents are excluded from the composite distribution of incomes of all consumers (i.e., of families and of single individuals). The income distribution of families and single individuals combined contains twenty-eight class intervals ranging from 'under \$250' to '\$1,000,000 and over'. The resulting figure for aggregate income received is 5 per cent less than the Department of Commerce estimate for income

paid out, after appropriate adjustments for the sake of comparability. Considering the fundamentally different nature of the two independent estimates, one can agree with Miss Kneeland that "this discrepancy does not appear excessive".⁹²

In addition to this overall distribution, the distribution of family incomes is further subdivided by size of family, region, size of community, occupation, and color. All in all, this monograph presents a relatively comprehensive picture of the distribution of income by size in the United States.

A partial distribution of income, the full details of which are lacking, has been presented by L. J. Chawner in a National Resources Committee monograph entitled *Residential Building*. It covers nonfarm households alone and applies to 1933 since its lower ranges are based on D. L. Wickens' *Financial Survey of Urban Housing*, a Department of Commerce publication. In common with the other distributions of income it, too, is based on *Statistics of Income* tabulations in the income classes above the \$5,000 level.

The number of nonfarm households was first estimated from the 1930 Census and then extrapolated to 1933 conditions by means of the Census Table 1 on annual population increases, after allowing for the doubling up of families during the depression years. These households were then distributed by the income class frequencies indicated in the *Financial Survey* and in *Statistics of Income*. Because the resulting aggregate of nonfarm income was slightly less than the corresponding national income estimate of the Department of Commerce,⁹³ the distribution was adjusted upward until the two totals agreed.

2 PURPOSES OF STUDIES

The forces that motivated Spahr and King to write their books on income distribution have already been discussed in the sections on wealth distribution. It deserves to be repeated here that Spahr recognized the distribution of income as intrinsically more

⁹² *Ibid*, p. 35.

⁹³ The Department of Commerce figure was adjusted for agricultural income, for incomes of individuals living in boarding houses, hotels, and labor camps, for net capital losses, for dividends to insurance policyholders, etc.

important than the distribution of wealth, while King is credited with the statement that "income is the best single criterion of economic welfare".⁹⁴ Spahr's principal interest was in the social problems involved rather than in the refined statistical methods necessary, while King, though perhaps primarily interested in the statistical aspects, nevertheless wound up with the exhortation, "Poverty must go", and gave evidence throughout his book of being ethically motivated. In a later article⁹⁵ he affirmed that immediate economic welfare is studied through the distribution of income, and that real or psychic income, corrected for changes in the purchasing power of money, is the goal of the income statistician.

Streightoff's purpose, unless it was the passive goal of showing that data on which a distribution of income should be based were lacking, is difficult to detect. If his interest was primarily statistical, then he must also be credited with unusual conservatism. On the other hand, what he actually achieved (not what he might have done, had pertinent data been plentiful) points to the conclusion that his interest was primarily with the social problems involved. He outlined a threefold utility of income statistics: (1) for framing social legislation, (2) in assessing certain kinds of taxes, (3) in influencing individual and public opinion. These aims would be considered too general by modern standards; but they do indicate that Streightoff was thinking about the uses to which he would put income statistics.

Thus far our investigators have not perceived that a knowledge of the distribution of income would be desirable for purposes other than social welfare (apparently used in the consumption sense) and taxation or government finance. Streightoff explicitly stated that he wanted only enough income statistics to make possible analysis of the social questions he raised, not of problems in economics such as wage theory.⁹⁶

⁹⁴ *Wealth and Income*, p. 217.

⁹⁵ 'Desirable Additions to Statistical Data on Wealth and Income', *American Economic Review*, VII (supplement), Part I (March 1917), 157-71.

⁹⁶ Streightoff, *op. cit.*, pp. 18, 19. He states that more data than he has specified as 'ideal' would be needed were the analysis to include problems outside the realm of his threefold program.

a) *Later studies primarily statistical*

There is no doubt that Macaulay's intentions were primarily statistical; the opening sentence of his section in Volume II of *Income in the United States* sounded this keynote, while in the more general discussion of Volume I the social implications of the findings were carefully eschewed. The National Bureau set out to answer the question, "How is the aggregate income divided among individuals?"⁹⁷ It answered this question by stating, in Lorenz curve fashion, that certain percentages of the people received certain percentages of the income. Further, as a consequence of O. W. Knauth's study of incomes above and below \$2,000, and Macaulay's temporal analysis of the tail of the income distributions, the National Bureau made the observation that "the net effect of our participation in the war was to diminish somewhat (at least temporarily) the inequality of the distribution of American incomes" and "if we consider the 5 per cent of those gainfully employed who had each year the largest incomes [over \$3,000, approximately], we find that their share in the aggregate of personal incomes declined from about 33 per cent in 1913-16 to about 25 per cent in 1918-19."⁹⁸ But these are hardly comments on the ethics of income distribution.

The only motive mentioned by King in the case of the 1921 distribution of income has already been noted in the discussion of the 1921 distribution of wealth (see above Sec. I, 2, b). That is, in the manuscript King considered the distribution of income as helpful to reformers and sales managers; a more extensive teleological discussion is wanting.

King's 1928 distribution, in the construction of which he was commissioned by a New York bank, was apparently built up for a specific purpose. Since the design is not revealed, the applicability of King's results can hardly be appraised. The fact that his sponsor was interested primarily in the larger incomes may have justified King in giving "practically no attention . . . to the distribution . . . among persons having incomes below the income tax limit".⁹⁹

⁹⁷ Mitchell, King, Macaulay, and Knauth, *op cit*, I, 1.

⁹⁸ *Ibid*, pp 146-7.

⁹⁹ Letter from King dated April 4, 1938

Leven's conversion of this distribution to a family basis was specifically intended to assess the ability of people of different income levels to pay for medical care on (a) an individual basis, (b) a group basis. Thus he properly deducted, from total income being distributed, \$5.3 billion of imputed income (from durable consumer goods), while the family income basis is more defensible for this purpose than for certain other uses to which income distributions are put. In the problem of medical care, the family does seem to be the significant unit. Finally, Leven was probably justified, when debating whether to include families supported by others, in deciding that the source of income was "perhaps immaterial".¹⁰⁰ However, a perusal of the resulting publication fails to reveal what use was made of this comprehensive income distribution. Instead, sample income distributions were relied upon to measure the ability to pay for medical care. Finally, there is King's admission that his original distribution, on which Leven based his construction, was mainly an upper-bracket income study; so one may question its applicability to the problem of medical care.

b) *Brookings and N.R.C. study consumption*

As students of the income distribution problem, the Brookings investigators stand out in several respects. Their construction of the distribution of income in 1929 is more fully explained than any preceding distribution; moreover, in lieu of fuller explanations of the earlier attempts, we may conclude that the Brookings estimate is at least as thorough and rigorous; finally, the Brookings project was not confined to the statistical aspects of the problem, but embraced in an unprecedentedly thorough fashion certain implications of the distribution of income. It thus achieved a balance between statistical and social purpose that is singularly lacking in the earlier distributions.

The keynote was sounded in the Foreword: "The purpose of the investigation as a whole is to determine whether the existing distribution of income in the United States among various groups in society tends to impede the efficient functioning of the economic system."¹⁰¹ Later, the goal sought by constructing a dis-

¹⁰⁰ Reed, *op. cit.*, p. 101n.

¹⁰¹ Leven, Moulton, and Warburton, *op. cit.*, p. 1.

tribution of income was more specifically stated: "If, therefore, we are to get a picture of the effective consuming capacity of the American people as a whole, and of the allocation of the national income as between consumption expenditures and savings for the development of capital equipment, we must first see the way in which the income of the nation is distributed among families and other income recipients."¹⁰² It is apparent that Leven and his colleagues were interested in two social aspects of the distribution of income: its effect on consumption and on savings. Furthermore, this purpose is assiduously pursued, and with the aid of data additional to the family distribution of income, conclusions are reached concerning these questions. The validity of these conclusions is less important to us than the fact that here was a distribution of income specifically constructed for and actually utilized in studying certain predetermined social and economic problems. In doing this, however, the Brookings Institution was pioneering in only one respect: that of both constructing and interpreting a distribution of income. Interpretations of distributions of income figures by students other than those who compiled them have been frequent, as witness the scores of books in marketing and consumption economics. Finally, in limiting themselves to these two implications of the distribution of income, Leven and his collaborators failed to consider, except in a very general way, the bearing their results had on taxation, velocity of money, law of demand, wage theory, and related knots in economics.

The purpose of Tucker's article in the *Quarterly Journal of Economics* is not far to seek. The general impression is that the writer is striving to justify, or at least to paint in favorable colors, the existing distribution of income in the United States. As stated in the article, however, the reasons for studying income distributions are two: (1) static analysis of the income distribution at a moment of time is "fundamental to any sound analysis of present-day social problems"; (2) "knowledge of how that distribution has changed is essential for any sound judgment concerning the progress of the nation and the merits or defects of the capitalistic system."¹⁰³ Tucker adds that, although the size

¹⁰² *Ibid*, p. 51

¹⁰³ *Op. cit*, p. 547.

of the national income is important of itself, so is its distribution since the latter leads to class cleavages and determines the rapidity of capital formation. Nothing along the lines indicated by these two explicit purposes is essayed in the body of the article. Tucker was concerned mainly with working out measures of inequality over time, but the reader is left with the general impression that justification of the status quo was also a desideratum.

The National Resources Committee's contribution to our knowledge of the distribution of income is "part of a larger study of the Nation's consumption demands in relation to its productive capacities".¹⁰⁴ This distribution was therefore devised primarily for use in compiling national estimates of consumer expenditures. The Committee points out some of the purposes the distribution of income could serve: "Those concerned with the living standards of the people need more accurate information on the extent to which shortage of income brings poverty damaging to health and happiness. Lawmaking bodies striving to apportion taxes equitably and without damage to the processes of industry need to know what will swell or deplete the streams. Business men require more abundant and reliable data on the probable demand for their products in order to stimulate and meet that demand. Any attempt on the part of Government or business to grapple with basic economic problems must rely heavily on what can be learned of the distribution of income among the various groups of the Nation's consumers."¹⁰⁵ Application of their distribution to these broader social purposes, however, is not essayed, although segments of such an analysis are promised in subsequent publications. In the volume the inequality in the distribution of income is made manifest by comparisons among different tenths of the population, while the discussion of 'The Three Thirds of the Nation' is probably not wholly dissociated from President Franklin D. Roosevelt's remarks concerning the plight of 'one third of the nation'. Such analysis provides good substance for newspaper editorials and discussion of social questions, but it hardly constitutes a scientific presentation of the significance of the existing distribution of income. Final judgment, of course, must await presentation of

¹⁰⁴ National Resources Committee, *op. cit.*, p. 1.

¹⁰⁵ *Ibid.*, p. 1.

further studies now being carried out by the National Resources Committee.

3 STATISTICAL EVALUATION

a) *Early studies largely guesswork*

It is difficult to assess the statistical adequacy of these attempts to construct a frequency distribution of income, for the methods followed were explained only in rough outline, while the computations were usually not shown at all.¹⁰⁶ The earlier attempts are generally less reprehensible in this respect than the later, but the statistics of the latter should logically be less open to criticism. The anomaly of explaining the method when it is obviously makeshift, and concealing it when it is likely to be more sound, probably arises from the fact that the statistical manipulations involved in these later constructions were so detailed and complicated that their description was impracticable. However, complexity is no defense of unexplained methodology, and indeed may constitute a criticism thereof, for the reason that (a) this complexity may be an attempt to gloss over inherently simple but fundamentally unsound methods, or (b) such complexity, even though genuine, may have deluded the investigator himself. In any case, the student is left with a dissatisfied feeling after perusing an unexplained statistical construction, especially one whose figures are carried out to several decimal places, thus conveying a sense of accuracy unwarranted by the facts.

Spahr's method, although more fully explained and less complex than that of the later investigators, is vulnerable at several points. He based the distribution of family incomes on the distribution of estates, so that he had to bridge not only the previously mentioned gap between estates and families, but also the more hazardous interstice between wealth and income. Equal wealth does not make for equal income, nor is all income derived from physical wealth; much income springs from human skills, knowledge, experience and, in general, labor. Furthermore, the proportion (two-fifths) of total income which he assigns to capital was not only a guess but also probably an exaggeration. Even today, with our economy more heavily mechanized than in

¹⁰⁶ The National Resources Committee's distribution is a possible exception

1890, salaries and wages constitute two-thirds (not three-fifths) of the net national product, while the return to capital, even including entrepreneurial withdrawals, amounts to no more than one-third (not two-fifths).¹⁰⁷ In addition, Spahr's use of the alleged function—propagated by Paul Leroy-Beaulieu¹⁰⁸—relating rent paid to income received, is of doubtful justification. According to A. L. Bowley in his review of Streightoff's *The Distribution of Incomes in the United States*, experience in England "shows that the relation between rent and income is variable and complex."¹⁰⁹ Finally, other lacunae in Spahr's analysis have already been indicated: e.g., his percentage return on the wealth holdings of each income class and his derivation of the average labor income of the well-to-do and wealthy classes.

Streightoff did not get far enough in his construction of a distribution of income to warrant criticizing his method. However, his proposals for ascertaining (a) farmers' expenses and (b) paid and imputed rent of urban dwellers are open to debate. Bowley criticized both these suggestions on the ground that (a) farmers do not know their expenses and (b) the rent-income function is variable and complex. The second criticism stresses a point too often neglected by statisticians, but the first is an unnecessarily pessimistic commentary on the knowledge and aptitude of farmers. Although it is true that they would have the same trouble, perhaps somewhat augmented, that a business man has in preparing his income tax blanks, yet the problem seems not insuperable, and once the farmers were trained to keep elementary accounts, the information Streightoff proposes gathering would be invaluable in distributing farmers according to the size of their net income.

Streightoff also lists his criteria of ideal income statistics: (a) urban incomes segregated from rural, (b) incomes adjusted for standard of living and purchasing power of money, (c) small class intervals, (d) incomes classified according to source (from property, labor, etc.), (e) occupation, residence, and race of income recipients, (f) complete returns from every gainfully

¹⁰⁷ Department of Commerce, *Income in the United States, 1929-37* (Washington, 1938), p. 22.

¹⁰⁸ *Répartition des Richesses* (Paris, 1897)

¹⁰⁹ *Economic Journal*, XXIII (1913), 425-7

employed. This is quite an order, but it is significant that he failed to give a definition of what shall be considered income, he did not specify whether he would use the individual or the family as his income recipient, and in calling for complete returns from every gainfully employed he ignored the many income recipients without gainful occupation.¹¹⁰

b) *King and Macaulay weak on explanations*

The methods employed by King in his pioneer work on *Wealth and Income* were unfortunately insufficiently explained to make it possible to assess their propriety. He was probably justified in considering the Wisconsin distribution as representative, at least for the middle section of his composite distribution, while his use of earnings data and income tax statistics for the lower and upper ranges respectively would seem logical. In arguing for a distribution based on families rather than individuals, he failed to see that for some purposes the former is preferable, and for others, the latter, but this is less a criticism of what he has done than of what he has left undone. The reviews of King's first attempt seem unnecessarily critical. G. P. Watkins dismissed it with the charge that King's "faculty of statistical analysis" was inadequate,¹¹¹ while A. A. Young in his more dispassionate review concluded that the method King used in estimating the aggregate annual product (which was distributed among the 28,500,000 families) "must have involved a large amount of conjecture".¹¹² He based this conclusion on the allegation that the federal income tax returns for 1913 showed that (a) King's scheme of distribution was "very much awry", or (b) his estimate of aggregate income was "very much too large", or (c) the federal government got only three-fifths of the income it was entitled to under the law. Young did not make clear how he arrived at this criticism. While the whole discussion lies outside the proper realm of this paper, it may be observed that the subsequent National Bureau

¹¹⁰ Since in subsequent discussion he recognized ownership of property and rights of private property (e.g., gifts and inheritance) as sources of income, Streightoff probably would not have been long in discovering, in an actual calculation, this last-mentioned oversight.

¹¹¹ *American Economic Review*, VI (1916), 443

¹¹² *Quarterly Journal of Economics*, XXX (1916), 585n.

estimate of the national income in 1910 was even larger than King's figure.¹¹³

The method employed by Macaulay in 1921 was also too sketchy to allow much criticism. His concept of the personal income recipient was not clear. Apparently it fails to comprehend non-gainfully employed persons with income, yet he significantly fails to say so. In 1929 Leven estimated there were 2,000,000 income recipients without a gainful occupation,¹¹⁴ so this may be a significant confusion in Macaulay's analysis. Furthermore, Macaulay's wholesale adjustment of income tax data for underreporting and negative incomes, and his smoothing of the final distribution curve raise several doubts in the reader's mind, especially since these adjustments are largely unexplained. Perhaps for these reasons, Bowley suggested that Macaulay might well have postponed publication of his estimates, or at least have buried them under his mathematics. "It is inadvisable that very doubtful estimates should be given currency. . . . Statisticians are sometimes inclined to let their desire to obtain a complete statement overcome their knowledge of the insufficiency of materials," the English statistician commented.¹¹⁵

King's 1921 distribution, as the description suggests, was devised by means of one arbitrary assumption after another. The results simply cannot be given the credibility demanded by the detail in which they are presented. The passage from gross to net farm income by means of the crop reporter sample is unconvincing, even though King does strive to correct for the lack of randomness in the sample by means of an arbitrary adjustment. The use of income tax data to adjust the distribution for incomes above \$2,000 is broader than any other writer has dared make. Because of exemptions and credits to income, it is generally recognized that these income tax data are unsuited for this adjustment below some such level as \$5,000. In fact, the National

¹¹³ King's estimate was \$30.5 billion, while the National Bureau put the national income produced in 1910 at \$31.8 billion (Mitchell, King, Macaulay, and Knauth, *op. cit.*, I, 13).

¹¹⁴ Leven, *op. cit.*, p. 186. In fact, in adjusting Macaulay's distribution to 1929 conditions, Leven felt constrained to supplement it with those "income recipients who were not gainfully employed" (*ibid.*, pp. 177, 178).

¹¹⁵ Review of National Bureau's *Income in the United States*, *Quarterly Journal of Economics*, XXXVII (1923), 510-17.

Resources Committee used these data for adjusting incomes only above the \$7,500 level. Furthermore, even if it is agreed that negative incomes are a legitimate constituent of the desired distribution, King's method of estimating these negative incomes by extending the curve of positive incomes, freehand, into the negative side of the graph can hardly be condoned. Finally, one wonders why King further confused the issue by the employment of at least four different concepts of income. Certainly the more refined concepts made the resulting synthesis not only more arbitrary and fictitious, but also more vulnerable to criticism against the general policy of considering unrealized capital gains and imputed interest as income. The chief argument in its defense, in the present instance, is that King evaded the question of which concept of income to use, by constructing distributions based on all the different concepts and letting the reader take his choice. Such a procedure may be statistically commendable, but it does further confuse an already complicated mosaic.

King's distribution for 1928 obviously cannot be evaluated, and Leven's conversion of it into a family distribution merits only passing review. Leven himself admitted "that the estimates are extremely rough and only tentative"¹¹⁶ while the fact that he elaborated his procedure in the subsequent Brookings inquiry makes an appraisal of this earlier work redundant. The many assumptions involved and the absence of clarity in his method have been indicated.

c) *Leven draws several criticisms*

Passing over King's temporal analysis of income distributions based solely on *Statistics of Income* tables and the Census estimate for gainfully employed, we reach the 1929 distribution of income by the Brookings Institution. This study, in sharp contrast to its predecessors, is replete with details concerning the methods employed and calculations made; yet certain significant explanations are missing. Information on how the 'under \$0' class was estimated is meager,¹¹⁷ and, as Burns pointed out, no

¹¹⁶ Reed, *op cit*, p 101

¹¹⁷ It seems designed to approximate the figure in *Statistics of Income for 1929* (Washington, 1931), p 11, for "Loss from sale of real estate, stocks, bonds, etc. other than reported for tax credit" This is a mere surmise, however

explanation is made as to how the independent estimate of personal incomes in 1929 was broken up into three distributions: (a) incomes of heads of families of two or more persons, (b) supplementary income recipients in families having more than one income, (c) incomes of unattached individuals living alone.¹¹⁸ The inclusion of realized capital gains and losses in income has been criticized on the grounds that since the former swell the number of families in the upper income brackets and the latter presumably dominate the negative income class the distribution's utility in a study of savings is impaired.¹¹⁹ Moreover, the synthetic families (artificial compounds of breadwinners and supplementary earners) used as the unit of the income recipient seem less defensible than existing or economic families, or ammanns. Certainly they introduce an unreality into the distribution that makes one wonder just what the final figures represent. Burns further characterized the personal income distribution underlying the family distribution as a patchwork based on scanty data and some dubious statistical devices. Among the latter he stressed the conversion of actual gross farm incomes into net farm income equivalents by means of a scanty sample and rank, instead of identical farms, correlation.¹²⁰ Furthermore,

¹¹⁸ Nor does Leven explain how the distribution of families with two or more income recipients was divided into two distributions of (1) families having only two income recipients, and (2) families having more than two income recipients, etc.

¹¹⁹ Burns, *op. cit.*, p. 495. This effect on the distribution was admitted by Leven, Moulton, and Warburton, *op. cit.*, p. 57, and defended on the ground that such gains and losses "must be included in the income received by individuals if we are to discuss intelligently the flow of income from individuals into consumption and investment channels" (*ibid.*, p. 13). The error arises, as Leven confessed (p. 13n), from the impossibility of segregating capital gains considered as income from capital gains considered as capital. This psychic difficulty would suggest omitting realized as well as unrealized capital gains and losses from income, when studying consumption and savings.

¹²⁰ This raises an interesting statistical problem. The correlation of gross with net farm incomes, in the samples, was made by first arranging the gross and net farm incomes in separate arrays, from low to high, and then by associating a given gross income with that net income occupying the corresponding rank in the array. That is, low gross incomes were associated with low net incomes, and so on. This method of correlation gives a higher coefficient than that in which a given gross income is associated with the corresponding net income for the same farm. It also, as Leven observes (p. 200n), has the effect of increasing the slope of the line of regression of the net farm income on the gross farm income, thereby swinging this

the correction of incomes above the \$5,000 level for underreporting and evasion is not clear. Leven states that the estimated number of income tax returns of persons reporting income from business and professions has been raised 65 per cent. This percentage is based on Macaulay's experience with the 1918 data, and on Leven's own survey, *The Incomes of Physicians*. He does not say whether the same percentage was used in correcting each income class. Nor does he make clear whether it is the total income of these reporting persons that is increased, or just their income from business and profession. Finally, several of the numerous assumptions inherent in Leven's calculations have already been cited, some may be empirically vulnerable, while all are certainly open to debate. But regardless of their general validity, the question arises whether the use of such algebraic relations, e.g., between occupational and total income or between gross and net farm income, does not conceal basic differences between the incomes of individuals or families—differences it is the purpose of a distribution of income to reveal. It may be true that, in general, net farm income is a certain function of gross farm income; but the fact that this function varies from farmer to farmer within a given gross-income range is one of the many reasons for inequality in farm incomes. The assumption that this function is constant for a given income class would have the effect of concealing important inequalities.

Statistical evaluation of Tucker's article is not appropriate

line counter-clockwise about the mean value. By increasing the slope of the regression line Leven in effect obtained lower values for net farm incomes in the lower income brackets than would have been obtained by identical-farms correlation. Leven argues in defense of this procedure that he did not wish to find the net income for the same farmer for whom gross income was known, but rather that he wished to reconstruct the distribution of net incomes for the entire group of farmers. There is clearly some point to his argument, since the use of a regression equation based on identical-farms correlation to estimate the distribution of net income inevitably tends to yield a distribution less dispersed than the 'true' one (cf. Part Two, section 1 of discussion by Milton Friedman). However, it is doubtful whether this argument fully justifies Leven's procedure, in view of the difficulties of attaching any clear and unambiguous meaning to it. Moreover, the higher correlation coefficient obtained by arranging the items in arrays does not increase the representativeness of the crop reporter sample, nor does it correct for the fact that the samples used to derive the relationship between gross and net were admittedly limited in large part to the more successful and better-remunerated farmers.

since he failed to construct a complete distribution of income. This does not deny the fact, however, that certain of his analytical devices seem to be misleading, while his contention that changes in the distribution of taxpayers' income indicate changes in the complete distribution is subject to considerable doubt. A moment's reflection will show that regardless of what happens to the upper income distribution, a shift in the location of the modal income, or a flattening out of the lower portion of the income distribution—to mention only two possibilities—would significantly alter the effective inequality of incomes.

d) *National Resources Committee*

For statistical adequacy the distribution offered by the National Resources Committee leads the list of American distributions of incomes. This is not to say that Miss Kneeland and her staff have constructed a 'correct' distribution of income in any absolute sense, but rather that they have come nearer the desired goal than any of their predecessors. In all fairness, it should be added that credit for this achievement is not necessarily due to any technical or statistical superiority of Miss Kneeland and her colleagues. Although they are undoubtedly competent statisticians, it must be admitted that they had at their disposal better and more abundant original data on which to base their distribution of income than any of their American predecessors in this field. Credit is due them mainly for exploiting rather fully what source material was available. In addition, they deserve commendation for explaining not only in some detail but also with laudable clarity the methods and assumptions used in passing from the sample data to the global distribution. In this respect, too, they stand out from among their predecessors.¹²¹

The major weaknesses of the National Resources Committee's distribution admittedly center on the use of the income tax data and the handling of the relief item; in addition, such points as the exclusion of institutional residents from the final distribu-

¹²¹ This does not deny the fact, however, that the description in *Consumer Incomes in the United States* of the adjustments made by means of data from income tax returns still leaves the reader under somewhat of a cloud. A fuller explanation of these adjustments is necessary. Such an explanation has been prepared by Enid Baird and Selma Fine and appears below in Part Three.

tion come in for incidental criticism. These first two considerations become particularly important when it is remembered that inequality in the distribution is profoundly affected by seemingly minor adjustments made at either extremity of the frequency table. The third point is relatively unimportant. Since institutional residents do not constitute a spending unit in the same sense that families and single individuals do, the Committee is quite justified in omitting them from the distribution in the study of consumption. But the Committee, in the volume under consideration, uses the final distribution to point out differences in the welfare of various segments of the population; for this purpose, the argument for excluding institutional residents is not so clear. Inclusion of the institutional residents would not only alter slightly the comparison of the three-thirds of the nation but also make the comparison more realistic.¹²²

On the problem of relief outlays, little comment is necessary. This particular question is peculiar to the present distribution: no previous investigator was faced with the necessity of distributing nearly a billion dollars in direct relief among the family and individual income recipients. In addition, the Committee itself confesses: "The methods used in adding the value of direct relief to these income distributions were necessarily crude, and involved various arbitrary assumptions based upon very fragmentary evidence from available relief studies."¹²³ How radically the distribution would have been affected by different assumptions and methods is problematical.

The adjustment of the distribution by data from income tax returns, on the other hand, warrants more critical inspection. Before utilizing the federal income tax data it was necessary to combine the incomes of husbands and wives making separate returns. This was effected by means of the general assumption that "at the high income levels husbands and wives making separate returns would endeavor to divide the family income as evenly as possible in order to avoid the surtax charges".¹²⁴ Some

¹²² In Chart 6 on p. 8 of the report, the lower third single men and women would be increased approximately $3\frac{1}{2}$ figures (or symbols), and the middle third men about $\frac{1}{2}$ a figure, were the institutional residents as classified in Table 16 on p. 32 taken into consideration.

¹²³ National Resources Committee, *op. cit.*, p. 65

¹²⁴ *Ibid.*, p. 83.

such assumption is admittedly necessary, but the present one seems to do violence to our sense of expectations. It is hard to believe, for example, that even the majority of the so-called 'economic royalists' share their properties and incomes evenly with their wives. Instead of pairing women with high incomes against men with high incomes, it would seem just as fitting to pair high-income women with medium-income men. The problem, however, is admittedly difficult; any system of pairing would have to be arbitrary.

The correction for nonreporting and understatement of incomes admittedly is likewise exceptionally artificial. Just why it was decided, for instance, to increase the number of families in the \$5,000 to \$10,000 income class 25 per cent is hard to perceive. And since no referable explanation is given, one is forced to conclude that it was largely 'drawn out of the air'. Also, how was the decision reached to increase the aggregate income of the same class 15 per cent? It would seem that if such corrections are going to be made, some sort of basis for selecting the given percentages, other than a vague reference to "tentative estimates advanced by several authorities", should be indicated. Otherwise the careful reader is left unconvinced, while the untrained reader is given a sense of accuracy in the adjustment that is belied by the facts ¹²⁵

Finally, it is unfortunate that the passage from statutory net income to economic income as defined in the study could not be effected more satisfactorily. Because only preliminary tables of certain 1935 income tax data were available, the National Resources Committee was forced to carry through this transition by means of at least two arbitrary assumptions. The first was that the necessary additions to statutory net income, (i.e., for net capital losses, contributions, taxes paid, interest paid, and tax-exempt interest received) and deductions from statutory net income (i.e., for capital gains) were distributed among the various groups of return (joint, separate, etc.) at each income level above \$5,000 "according to the proportions of aggregate net income [statutory]

¹²⁵ *Ibid*, p. 84n. In this connection the reasoning underlying the following footnote is interesting: "The sequence of the adjustments for nonreporting and understatement [the former was made first, and the latter second] implies that families added to the distribution to allow for nonreporting would have understated their incomes to the same extent as did the families that actually filed income tax returns "

received by each group at the various levels".¹²⁶ Second, within each income class the combined additions and deductions required to pass from statutory net income to economic income were apparently divided evenly among the income recipients in each class. Both assumptions are far from obvious, and their use necessarily attenuates the reliability of the resulting distribution.

The distributions constructed by the Brookings Institution for 1929 and by the National Resources Committee for 1935-36 are the most satisfactory thus far presented, all things considered. In the accompanying outline, certain respects in which they differ are pointed out, in order to illustrate some of the many decisions the investigator must make.

BROOKINGS INSTITUTION	NATIONAL RESOURCES COMMITTEE
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Nature of Sample

The lower ranges are based on a composite of many small samples for varying years and groups, adjusted to 1929 conditions

The income classes above the \$5,000 level are based on *Statistics of Income* data

The lower ranges are based on the Consumer Purchases Study of 300,000 families representing various regions and groups in 1935-36.

Above the \$7,500 level the distribution is based on *Statistics of Income* data.¹

Differences in Elemental Definitions

The definition of income provides for the inclusion of capital gains and losses. Hence, the negative income class became a significant part of the distribution. Moreover, supplementary incomes (as opposed to earnings) are included.¹²⁷

The definition of income excludes capital gains and losses, except in lower income classes on goods exchanged within the year. No negative income class was segregated.

¹²⁶ *Ibid.*, p. 82, Part Three, Sec IV, especially note 8

¹²⁷ Apparently the same items of non-money income—farm produce consumed on the farm and imputed rent on owned houses—are included in both distributions. There may be slight differences in details, however.

Differences in Elemental Definitions—Cont

A slight understatement occurred because of the inclusion for income levels above \$7,500 of supplementary earnings rather than supplementary incomes.¹²⁷ At lower income levels, supplementary incomes were included.

The definition of family refers to census-biologic families, in which blood relationship is the primary attribute. The actual joining of the supplementary income recipients to the main breadwinner is partly a matter of chance, and the 'families' are more or less 'compounds'.¹²⁸

The definition of family refers to economic families, i.e., living under one roof and having a common or pooled income. Some arbitrariness arises in the pairing of husband and wife in the upper income classes, and in the exclusion of self-supporters from the family.¹²⁸

Differences in Procedure

Occupational income was derived, made to jibe with the Department of Commerce estimate, then supplemented with (1) other income of the gainfully employed, (2) that of those without gainful occupation.

The incomes of farmers were estimated separately by means of Department of Agriculture figures and the crop reporter sample.

Up to the \$15,000 level, families were synthetically built up by joining supplementary income recipients to main breadwinners.

The nature of the sample made it possible to pass directly to total income (except a small item of supplementary unearned incomes), which figure happened to jibe tolerably closely with the Department of Commerce total.

Since farmers' incomes were included in the Consumer Purchases sample, the necessity for separate estimation did not arise.

The lower ranges were already on a natural—or existing—family basis, because of sample. Arbitrary pairing was employed to put upper ranges on a family basis.

¹²⁸ Neither distribution, of course, avoided certain artificialities inherent in the Census definition of family.

Correction of Income Tax Data

Underreporting and evasion in the incomes of \$5,000 and over were set at 65 per cent, the estimated number of income tax returns for business and professional incomes was increased by that percentage

Corrections for nonreporting follow. increase the number of families and aggregate income in the \$5,000-\$10,000 class 25 per cent, in the \$10,000-\$15,000 class 15 per cent; in the \$15,000-\$20,000 class 5 per cent.

Corrections for understatement: increase the aggregate income of families in the \$5,000-\$10,000 class 15 per cent; in the \$10,000-\$20,000 class 15 per cent; in the \$20,000-\$25,000 class 10 per cent, in the \$25,000-\$50,000 class 5 per cent. The overall estimate of understatement equaled 10 per cent, and was made after the nonreporting correction had been introduced.

This correction was applied to the distribution of occupational income

These corrections were applied to the distribution of total money income, before the addition of the supplementary earners.

Inclusiveness of Final Distribution

Constituents of institutional groups are included in the final distribution as unattached individuals in the category of spending units.

Institutional residents are not included in the final distribution, although their incomes are estimated and presented separately.

4 RECAPITULATION OF INCOME DISTRIBUTION STUDIES

The accompanying outline presents in summary form the more important characteristics of the studies of the distribution of income discussed in this section.

NAME	OPUS	DATE OF DISTRIBU- TION	BASIS OF ESTIMATE	UNIT	PURPOSE, REMARKS
C. B. Spahr	1896	1890	Wealth holdings and common ob- servations	Census family	Social - taxation problem analyzed
F. H. Streightoff	1912	1904	Labor earnings	Occupied persons	To show necessary data lacking, in- cluded income from male labor alone
W. I. King	1915	1910	Labor earnings Wisconsin in- come tax data, federal data on the rich	Census family	Primarily statistical.
F. R. Macaulay	1921	1918	Wage samples and federal income tax data	Income recipients	Statistical; in- cluded negative and imputed in- come.
W. I. King	Unpub. Unpub.	1921 } 1928 }	Federal income tax data, wage and budget samples	Income recipients	Statistical; for New York bank
Maurice Leven	1933	1928	Converted King's 1928 estimate	Family (synthetic)	To assess people's ability to pay for medical care, ten- tative conversion to families.
Maurice Leven	1934	1929	Wage and farm samples, federal income tax data	Family (synthetic)	Consuming capac- ity and saving power, also statis- tically ambitious.
National Resources Committee	1938	1935, 1936	Study of Con- sumer Purchases and income tax data	Economic family	National con- sumption esti- mates; best distri- bution yet con- structed

III Conclusion

One conclusion from the foregoing review seems inescapable: statisticians and economists have been striving valiantly to fill the persistent demand in this country over the last generation or two for statistical evidence concerning the distribution of wealth

and income. Evidence of their efforts began to appear some two score years ago. Since then there has been a steady flow of published attempts to distribute by size the wealth holdings and incomes of the people in this country.

The data and methods used and the general aims held by these investigators were indicated in the preceding pages, and an attempt was made to evaluate the statistical adequacy of these distributions. Unfortunately, their evaluation must be in relative rather than absolute terms. A relative appraisal of the adequacy of these distributions leads to extensive differences of opinion, a point of which the readers of this paper probably need not be reminded. But even sharper differences of opinion would arise were one to assess in absolute terms the degree to which a given distribution of wealth or income was adequate for the purposes for which it was intended and used. Probably some would aver, in good faith, that all these published distributions were totally inadequate. On the other hand, a few might insist, with more temerity than propriety, that a given distribution was entirely adequate. Although the persons at the former extreme would probably outnumber those at the other, the majority of qualified observers would likely fall into a middle class of those who hold that the existing distributions give a rough idea of the actual distribution, but that they are too crude and inaccurate to allow measuring temporal and spatial differences in the inequality of distribution—differences that must be known if changes in relative welfare of different social groups, in tax burden and taxable capacity, in the volume of individual savings and in the pattern of consumer demand are to be analyzed. Furthermore, this temperate group of observers would perhaps question whether existing distributions give a true picture of the relative welfare of the different strata in society, even at a given moment; or make possible a thorough analysis of the existing patterns of consumer demand and individual savings.

A crucial question emerges from these considerations. Why, in view of this pressing and widely felt need for accurate statistical information on the distribution of wealth and income, do we not have better and more adequate data? Why has there been this time lag between the realization of a need and its satisfaction?

That American statisticians have been unusually inept, or that they have been unwilling to give reign to the imagination can hardly be cited as reasons why their efforts in this field have met with such limited success. In fact, the reverse is probably nearer the truth. Many investigators have been too ambitious and have overstepped the limitations of their data in striving to construct statistical pictures of the distribution of wealth and income.

The reasons why the statisticians have been thus thwarted fall into three general classes. On the one hand we have the psychological factors which lead a person to consider his own income and wealth a secret even though he may be among the front ranks of those clamoring for statistical information on wealth and income distribution. Moreover, this spirit is probably fostered by democratic institutions that aim to exalt free private enterprise, individualism and personal liberty—all with a minimum of government interference. It is also undoubtedly encouraged by the fear that any personal income and wealth information will be used for taxation purposes. Whatever the psychological, social, and political factors contributing to this attitude of reservation, its existence is strongly attested by those who have had the occasion to attempt, through field surveys or otherwise, to procure wealth and income statistics from a considerable number of persons. Hesitancy about answering questions on income and wealth is more pronounced in the upper economic classes; but some maintain that persons in the lower strata, although more willing to divulge the desired information, nevertheless commonly misstate their incomes, either through ignorance or design. In fact, it has become almost an axiom that the adequacy of the response to a questionnaire or field survey varies inversely with the number of questions on such personal matters as income and wealth.

The second group of reasons accounting for the failure of statisticians to meet this demand for statistical information on the distribution of wealth and income lies nearer their own doorsteps. It is the failure to reach satisfactory definitions of wealth, of income, and of family or whatever wealth-holding and income-receiving unit is being employed. Irving Fisher has observed that there is hardly a *communis opinio* among economists on the definition of income.¹²⁹ Simon Kuznets has indicated some of the

129 'Income' *Encyclopedia of the Social Sciences*, VII, 622-5.

obstacles in the way of selecting a usable and meaningful definition of wealth.¹³⁰ The idiosyncrasies of the Census definition of family are well known. That the National Resources Committee, to cite only one example, felt constrained to employ a somewhat different definition of family is itself evidence that the Census concept is not wholly appropriate for income distributions. Macaulay tried to avoid some of these difficulties by using individuals rather than families. Whether such procedure eludes more difficulties than it raises is open to question. If the individual basis is used, then King's further refinement to 'ammain' warrants consideration in certain cases.

A third possible reason why attempts to construct distributions of wealth and income have been relatively unsuccessful is that, in addition to the meagreness of primary data, functionally related series are also scarce. There seem to be few economic series sufficiently closely and simply related to income and wealth to make it possible to derive the latter from the former. The attempts repeatedly made in this direction have thus far not been attended by particular success. Efforts to derive the distribution of income from the distribution of rents are one example; the method of estimating wealth holdings by capitalizing income is another.

From this brief discussion it would seem that several obstacles must be overcome if a satisfactory distribution of income, for example, is to be constructed. The first is a decision as to the purpose of the distribution. Once that has been made, a suitable definition of income and the selection and definition of the income-receiving unit (family or individual or ammain) must be made. After this underbrush has been cleared away two courses are open to the statistician; these may be considered either as alternatives or as complements. The first is the direct procurement of statistical information, either for a sample or the universe, on the incomes of the (say) families. This, in turn, may require either a remodeling of the people's mores in the direction of inducing them to divulge more freely and accurately the desired information concerning their incomes, or legislative enactment making obligatory reporting of incomes to the Census, or possibly both.¹³¹ The second course, which may be employed

¹³⁰ *Volume Two, Part One.*

¹³¹ Even the statutory requirement would have its limitations. Chances of so

either as a substitute for or a complement to the first, is to ascertain the distribution of rents for relatively homogeneous groups, derive the rent-income function for each such group, and pass therefrom to the distribution of incomes. Weighting and summation would then give the global distribution of incomes.

It would be hazardous to conjecture precisely when statisticians will succeed in overcoming the present obstacles to really adequate distributions of income and wealth for this country. Because of renewed positive interest of public as well as private research organizations in the problem, one may expect in the near future not only better distributions but also distributions adequate for statistical induction.

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P.A.S.A. Publications of the American Statistical Association (title for Volumes I–XVII)

J.A.S.A. Journal of the American Statistical Association (title for Volumes XVIII to date)

A.E.R. American Economic Review

Q.J.E. Quarterly Journal of Economics

J.P.E. Journal of Political Economy

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Discussion

I SIMON KUZNETS

Mr. Merwin's survey reveals the variety of purposes that motivated the construction of distributions of income and wealth by size; and describes exhaustively the daring feats of ingenuity performed by skillful statisticians in their attempts to overcome the absence of basic information. In view of the lack of basic data, it seems surprising not that the estimates have been so few, but that there were any at all; not that they were so poor, but that they came within hailing distance of the truth.

However, the matter that interests me most is not the character and quality of the estimates, but the factors that explain the absence of basic information in the field. Why was no information collected during these decades on a sufficiently comprehensive scale to make possible an acceptable distribution of income or wealth by size among individuals or families? A great deal of other basic economic information was being collected, largely by public agencies: the censuses of population, agriculture, manufacturing; reports by the Interstate Commerce Commission on most public utilities; by banking authorities on the state of the credit system; by custom house authorities on foreign trade; and the like. Since, after all, the economic system functions in order to satisfy the needs of the nation's ultimate consumers, is it not surprising that information on what the economic system produced was not supplemented by equally important data on the flow of incomes to individuals or families, or on the stock of wealth at their command?

Mr. Merwin suggests briefly some of the factors that may serve to account for this gap in the economic information in the past and, to a less extent, even at present. But this point needs further discussion and illumination. While the supply of basic economic

data may be affected partly by accidental events, it is on the whole determined by fundamental views of the body social as to the relative importance of various aspects of economic activity and the need of information to aid in the solution of various economic problems. Data collection is expensive, both in the narrow sense of costing money to the collecting and the reporting agencies and in the broader sense of effort needed to translate the frequently unformulated and unaudited impressions or records into reportable and quantitatively measurable facts. If in this country during recent decades, public agencies have been collecting so many data on some aspects of economic activity and so few on others, there must have been good and sufficient reasons. It is important to ascertain these reasons, for they provide clues to the factors that determine the supply of statistical data—a problem close to the heart of every empirically minded student in the social sciences. We shall, therefore, proceed to a necessarily tentative consideration of these reasons, with particular reference to the data on distribution of income by size among individuals or families.

It may be suggested that the path of progress in the collection of statistical data in the economic field is from population to production, and from production to distribution. It seems natural that the collection of census data by any nation would begin with the quantitative aspects of population, of people as the substance of the nation and the *ultima ratio* of its existence; would then proceed to ascertain what these people produce; and would concern itself with the distribution of results of economic activity among individuals or families only after having ascertained how many of them there are and how much they produce. One could thus say that the basic reason for the absence during recent decades of comprehensive information on distribution of income by size, concurrent with an apparently plentiful supply of data on production, is that generally the former would be collected later than the latter; and that this country was still in the phase of statistical development at which data on production could not yet be complemented by data on the distribution of the results of such production among ultimate consuming units.

Whether this stage-theory of the development of comprehensive statistical data is valid in terms of the actual historical ex-

perience in modern countries, I do not venture to say. One does get the impression that censuses of population and of production, in the order named, are the earlier phases in the growth of statistics in the various countries since the industrial revolution; but a careful test is beyond the scope of the present comments. In the absence of such careful tests, and of supplementary evidence, it would be impossible to demonstrate that with respect to this generally valid succession of stages, this country must have been in the second, the development of production statistics, and has failed as yet to reach the third, the development of data on distribution of results of production among consuming units. Nor would there be much meaning in such a statement.

But whether or not the generalization is historically valid, it should still be indicated why the development of various bodies of data should be sequential rather than concurrent. Why should data on distribution of income by size wait until data on population and production are complete, rather than be developed concurrently with the latter? The answer to this question seems to be that with scarce means, some selection of fields of comprehensive coverage must be made; that knowledge of one aspect of activity is an indispensable prerequisite for planning the statistical coverage of another; that the concurrent collection of several bodies of data is not necessarily complementary in terms of reducing per unit costs but may, on the contrary, serve to raise such costs; and that many statistical data are byproducts of the administrative activity of the government and hence are necessarily selective since governments cannot deal directly with everything at once. That in this necessarily sequential relation, data on population and production should precede those on distribution and consumption seems plausible.

This general impression of the primacy of production data and of the study of production processes has perhaps been reinforced by the rapid industrial development of this country during the decades under consideration. This resulted in a rather widely entertained, and, to a considerable extent justified, notion that the country's economic progress, i.e., increase in total product and economic power, was rapid; that the potentialities of such progress in the future were still considerable; that whatever problems might exist in the distribution of the national in-

come among the consuming units of the nation would be solved by the rapid rise of the production curve; and that correspondingly the function of the government was to preserve that freedom of private enterprise which would allow it to continue its splendid contribution to social welfare by raising the state of technical arts, extending the area of economic activity, and increasing the total of goods produced. Such an attitude meant that data collected for the purpose of information and observation would relate primarily to production—as a basis of judging the rate of progress and its origin in the various industries. It also meant that the public agencies were to be concerned primarily with the preservation of free competition within the country and maintenance of preferred position against foreign competitors—functions that involved dealing primarily with production agencies and hence collecting primarily production statistics. And data on production, being available largely within and hence provided almost exclusively by producing or business units, cannot yield data on distribution of income by size among consuming units.

If this was the viewpoint of society at large, there was also little pressure for income information on the part of business groups. Problems of marketing and distribution had not yet come to occupy the center of attention that they seem to now: the rapid extension of the productive system and growth in the volume of output meant that the restriction of the markets was a sporadic rather than a chronic circumstance. The growth in quality goods and semi-monopolistic markets, of advertising pressures and marketing surveys, was still largely in the future. The relation between income levels and consumption was of less importance to the business community at large than it is now; and thus one of the effective forces now pressing for information upon distribution of income by size, combined with regional breakdowns, was lacking, or at least much weaker than it is now.

The attitude of the individual to the provision of information on income was to a large extent a corollary of the general view of the body social on the greater importance of increasing production (and population) than of remedying the ills of income distribution, both products of the free individualistic organization of economic activity. Naturally enough, the people who

were at the top of the income pyramid resisted attempts to shed too much light on the inequalities in the distribution of income; and they continue to do so. But their resistance could not and cannot be successful unless it is backed by a negative attitude to the revelation of income information, an attitude that is a direct corollary of a viewpoint suggested above.

The connection is not difficult to see. If one believes that the economic system is enjoying and will enjoy in the future a rapid growth of output that will overcome any transient ills resulting from inequality in the distribution of income; if one believes that this beneficent progress is due to the invisible hand of providence which converts the selfish striving of individuals to their economic aggrandisement into a horn of plenty for the country at large; and if one considers further that part of this selfish behavior of free individuals is to withhold information of any sort, unless required by the state in order to perform its proper functions—then the reluctance to supply income information can be fully understood. The state should not do anything about income distribution, since the recipient of large income is being rewarded for his greater contribution to the national product and the recipient of small income is being punished for his failure to contribute. Since the state does not require income data of this type for the prosecution of its administrative activity; and since the unequal distribution of income is just a tool, and an efficient one, in stimulating economic growth, there is no reason why the free individual should sacrifice his competitive right to withhold information. The man who thought or was forced by society to think that he was the captain of his economic destiny would naturally resist giving an account for it to anyone but to his economic soul.

Technical obstacles undoubtedly added to the difficulties. To begin with, comprehensive coverage of any information relating to individuals or family units in the economy is much more difficult than coverage of productive or business units, for the simple reason that there are so many more of the former. Second, and perhaps more important, it is far more difficult to obtain accurate quantitative information from a consuming unit than from a member of the business system, since the accounting of the former is much more sketchy.

In this connection, it should be noted that of the various types of income, the one on which it is most difficult to obtain accurate information is that of individual entrepreneurs. In the case of salaries and wages, dividends or interest, the overt receipt of a payment makes it possible to recognize income clearly and to ascertain its magnitude with relative ease. The establishment of net income of individual entrepreneurs is a heroic task indeed. In the decades when individual entrepreneurs bulked so large among the income-earning population of the country and when even corporations were often unaware of the exact magnitude of their net income, it would have been difficult to survey family incomes in the same way as one establishes in the Census the age or sex of individual members of the families.

There is another, admittedly conjectural, consideration of great bearing upon the present status and prospects of the field: a distribution of income by size among families, for a single year or only a few years, and without many corollary data, is of limited value in the analysis of either policy or economic problems. Such a statement may seem at first surprising. However, brief reflection will show that even though great human interest attaches to a distribution showing that in a given year there were x families, each having an income of a million dollars and over, and y families, each having an income of less than one thousand dollars, such an estimate taken by itself for a year or two is scarcely illuminating. Of course, such estimates are used, but ordinarily on the dangerous assumption that the distributions for one year hold for a longer period; that differences among various income classes in cost of living, size of families, or other factors are not significant for interpreting income differences for the purpose at hand—and there are very few purposes for which such an assumption is tenable; and that there is enough stability within the distribution from year to year to allow a rough identification of families within a given income category with the same families within a similar income category at another time.

Of course, it is questionable that the realization of the low value of a distribution for a single year, unaccompanied by many corollary data, was clearly in the minds of the people who were in a position to determine whether comprehensive data in the field would be collected. But it would not be unreasonable to

assume that this feeling, namely, that unless one could initiate a continuous series of such estimates and obtain both the necessary breakdowns and the subsidiary data the effort was not worth making, did serve to reduce the pressure and to prevent sporadic collections of data.

The striking additions to the data on distribution of income by size during very recent years tend to bear out the tentative analysis above of the factors that made for the absence of such data in the past. The accumulation of information on population and production and their intensive use by students in the field resulted in relatively satisfactory knowledge of these aspects of the economy. Of course, significant gaps remain even in these fields, especially on some of the dynamic elements: population migration, production of intangible goods, scale of producing unit and of business unit, etc. But a great deal of further work in these fields must await better data on distribution of income among consuming units, data the absence of which is felt perhaps more acutely than ever before by students whose major interest is not income measurement or in the analysis of closely related economic problems.¹

More obvious is the change in social attitude and in the economic functions of government as they are now conceived by society at large. The feeling that there are great reserves of production growth in the future is not widely entertained now; and therefore, to put it mildly, serious doubts are entertained as to the future effectiveness of the system of free and individualistic economic organization. That this organization is largely a thing of the past, a result of the growth of private and semi-public monopolies, is a significant element in the changed situation. And there is less conviction that the economic fortune of an individual is entirely or even largely a result of his personal ability. It is realized that the complex of economic institutions does not function perfectly or even tolerably well, and that these imperfections have painful repercussions among large groups in our society, repercussions these groups could not cope with or avoid by any individual effort, no matter how well meant or intelli-

¹ It is important that the advocacy of income questions on the tentative population schedule for the 1940 Census came from population statisticians interested in the economic factor in differential fertility.

gently designed. Correspondingly, the economic fortunes of those favorably situated are seen as due only in part, and perhaps small part, to their personal ability to contribute to social welfare: they are seen as being to a large extent a result of strategic situations created by social institutions and seized upon by a few individuals, often to the detriment of society at large.

It is this viewpoint that provides the pressures and justification for activities of public authorities designed to modify the working of economic institutions in their determination of the distribution of income among individuals and families. It provides the *raison d'être* for a graduated income tax, social security legislation, laws concerning wages and hours, etc. It thus brings government into fields of administrative activity whose byproducts are large bodies of data on distribution of income by size. And it creates an attitude on the part of the community at large that makes the provision of income information a natural and acceptable step designed to help the public authorities in dealing with a commonly recognized economic problem.

Furthermore, the increasing attention the business system at large pays to methods of gauging and influencing the consumers' market results in pressures, often effective, for information on distribution of income by size and on related expenditures. True, this particular drive is somewhat biased toward higher income brackets (as is true of the byproducts of income tax laws) and often leads to a somewhat exaggerated estimate of income magnitudes; but it is a potent factor, nevertheless, in forcing this field upon the attention of public authorities.

The technical difficulties in the way of collection of income information of the type under discussion are also becoming less formidable, partly because of the increasing importance of incomes in the form of overt payments, partly because the technical means at our disposal for dealing with large populations have increased at an undoubtedly greater rate than the population itself. Such means include not only the technical and organizational machinery for dealing with large scale surveys, but also the statistical theory that makes it possible to establish in advance the reliability of samples and thus to select the latter on a carefully thought out basis.

It seems quite probable that we are on the verge of a period

during which comprehensive data on the distribution of income by size and hence reliable distributions based on such data will become available. We may, therefore, be confronted in the very near future with choices among various ways in which such information can be obtained and distributions based on them derived. While deep-seated factors determine the feasibility or impracticability of obtaining comprehensive statistical information on this or another phase of social activity, once these factors are favorable to the collection of such information, the academic student, guided by general interests only, is in a position to shape many of the evolving data and assure their greater usefulness in the treatment of the problems with which he is concerned. And this he can do by participating in the selection of the various alternatives that exist, either overtly or implicitly, when the task of comprehensive coverage of a field like distribution of income by size is initiated.

In this choice the consideration already stated, that distributions for single years, unaccompanied by many related data (on occupation, industry, family composition, age, sex, location, cost of living, expenditures and savings, etc.) are of little use, seems to me paramount. In the various choices two criteria should be given the heaviest weight, next to that concerning the basic reliability of the information likely to be obtained: the likelihood that the data will (1) become available continuously, on an annual basis or on the basis of relatively short time units; (2) be obtained in such a way that correlation with many other factors will be possible. We may be disillusioned by the low analytical value of the first distributions, since their great significance will become obvious only after they have cumulated into a long series and have been tested for association with variables other than income. But unless we assure that such development will be possible, our disillusionment is likely to become permanent.

Part Two

INCOME CAPITALIZATION
AS A METHOD OF ESTIMATING
THE DISTRIBUTION OF
WEALTH BY SIZE GROUPS

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Discussion

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INCOME CAPITALIZATION AS A METHOD OF ESTIMATING THE DISTRIBUTION OF WEALTH BY SIZE GROUPS

CHARLES STEWART

NATIONAL income and its distribution have thus far proved both more susceptible of measurement and more useful in economic analysis than national wealth and its distribution. It has, indeed, been questioned whether, if the former is available, the latter is necessary or of much use.¹ Not infrequently, it has been suggested that the one distribution is tantamount to the other. To this writer it seems that estimates of wealth, and its distribution by size classes, would prove of substantial independent value for economic analysis, provided they were considerably more accurate than the estimates heretofore made.

The distribution of wealth has been sought chiefly for the purpose of indicating the prevailing degree of inequality in a country, or of comparing the degree of inequality in countries of different social structures. Even aside from their statistical crudeness the results have not proved adequate indicators of economic welfare. The grouping, for example, of individuals of the same wealth but in far different positions of economic security and power is a definite shortcoming, but this is probably even more serious in the case of the income distributions. Even so the results may demonstrate, satisfactorily if roughly, the measure of inequality prevailing at any given time.

¹ See Simon Kuznets, *Studies, Volume Two*, Part One, especially pp 37-61, discussion by R. T. Bye, Gerhard Colm, M. A. Copeland, and E. M. Martin, and reply by Dr. Kuznets

That unwarranted generalizations have been derived from these rough estimates for purposes of political argument is not to be denied. But if it is true, as responsible political commentators would have us believe, that one of the major aims of the present administration is to bring about some redistribution of wealth, then it seems obligatory for economists to produce estimates of greater merit than the pioneer estimates which have been so abused. The question of the measurement of inequality may seem to some an idle question, simply a matter of popular curiosity, without much utility for economic analysis. Yet it will remain a matter of paramount public interest so long as economic inequality remains a political problem.²

In many respects income may be a better index of economic welfare, if not of power, than wealth, but to the extent that many types of unrealized incomes are excluded it is certainly defective. Persons in either high or low income brackets who derive their income from earned sources are not in economic positions similar to those who derive their income from property. This is another important argument in favor of the view that wealth is a better index of economic power. Unless the theoretical and practical difficulties in the way of capitalizing earned incomes are surmounted—or those involved in estimating unrealized items of income—the two distributions will not be identical. Not only can both be used as checks against the other; each will prove of use in the treatment of special economic problems.

Neither the question of tax justice nor the economic effects of taxation, for example, can be fully studied without more adequate information on the distribution of wealth. Facts about income do not completely suffice for these purposes. The campaign to 'broaden the base' of the income tax is defended on the grounds that our tax structure is highly progressive. No refined judgment, however, as to the weight of the entire tax burden upon the various strata of income and wealth can be made without adequate data on the distribution of wealth. To some degree the capitalization of property incomes may suffice but for any complete analysis involving property, estate, and gift taxes, this would not be satisfactory. If tax justice is to be given intelligent consideration in

² Cf. Harry Campion, *Public and Private Property in Great Britain* (Oxford University Press, 1939), Introduction by J. Jewkes.

the forthcoming simplification of the federal tax structure, this matter becomes of great importance. And for any judgment as to the influence of taxation upon savings and investments, it is useful if not imperative to have wealth distributions of considerable refinement.

In Europe and in this country several methods have been developed for estimating the distribution of wealth by size groups. Before the imposition of the income tax in the United States, county probate court records afforded virtually the only data for such purposes. Since *Statistics of Income* became available the income tax data have been used in various ways that will be described in the following sections. Few attempts have been made to construct wealth tables simply by capitalizing items of income reported for taxation; nor is such a purpose the aim of this article.

It seems to the present writer that two techniques may be employed to obtain wealth distributions that are not mere reflections of income statistics. The first is the estate-multiplier method, discussed in the next section, which is widely used abroad, particularly in England. The second is the method suggested by Fritz Lehmann which utilizes, in combination, American income and estate tax data.

Since the material necessary for the estate-multiplier method is not available for the United States, the main purpose of this paper is to test Lehmann's method and to compare the results and problems with those of other methods which are also based, at least to some extent, upon the income-capitalization approach.

I The Alternative Methods

1 THE ESTATE-MULTIPLIER METHOD

Of the various ways of estimating the distribution of wealth by income or wealth brackets, the estate-multiplier method is probably the most desirable, but it is at present inapplicable to the American statistical material. This method rests "on the assumption that the dying in each age group are a fair sample of the living in the same age group". Making this assumption, "it is possible from the [estate duty statistics] to construct a table of distribution among the living. The numbers and values of decedents'

estates in each age-group are multiplied by the reciprocal of the death rate for that age group." ³ Curiously enough, the federal estate tax statistics for 1922-24 were cast in the right form to provide the data required by this method. The number and value of the estates filed at time of death were presented by age groups and sex. By multiplying the number of estate returns by a factor representing the ratio of the 'quick and the dead', for each age group and sex, the distribution of wealth could be estimated. To the writer's knowledge these statistics have not been utilized.⁴ It may be that the material is too rough. The age groups in the official estate statistics were rather broad (ten years, in most cases). More serious is the fact that a total of 1,918 estates were untabulated in the annual statistics of 1922, 1923, and 1924; and when later summarized the data were not broken down by age groups.⁵ There is no reason except expense why the old practice should not be resumed and improved. It would be sufficient for this purpose if such compilations were made at five-year intervals. For any year since 1916 the necessary material might still be obtainable from the Treasury records; and the results should be more valuable than the estimate of the Federal Trade Commission for 1912-23, at least as far as the upper brackets are concerned.⁶

One important difficulty, however, is involved: What is the mortality rate, by age groups and sex, of the wealthy stratum of the population? It is no doubt different from that of the general population. This information seemingly is lacking for the United States but the difficulty is not at all insuperable. In England, for example, the death rates for various 'social' or occupational classes have been published by the Registrar-General for selected years.⁷

The chief limitation of this method, if applied to the federal

³ Josiah Wedgwood, *The Economics of Inheritance* (London: Routledge, 1929), p. 45. See also G. W. Daniels and Harry Campion, *The Distribution of National Capital* (Manchester University Press, 1936), p. 4.

⁴ Cf. W. L. Crum, *The Distribution of Wealth* (Harvard Business Research Studies, No. 13, 1935), pp. 10-14. Estate tax returns by age and sex groups are plotted in Pareto-type curves, and these are taken as presumptive distributions of wealth, but the estate-multiplier method is not applied.

⁵ U. S. Bureau of Internal Revenue, *Statistics of Income, 1924*, p. 95.

⁶ Federal Trade Commission, *National Wealth and Income*, Senate Doc. 126, 69th Cong., 1st Sess. (Washington, 1926), pp. 56-69.

⁷ Cf. Wedgwood, *op. cit.*, p. 45, Daniels and Campion, *op. cit.*, pp. 14-18.

estate statistics, is the fact that the results would refer only to the very wealthiest classes. Because of differences in estate taxes, this limitation is not present in the English estimates. The residuum of national wealth in the hands of individuals could be allocated, however, to the broad wealth class below the federal tax limit, though this involves some dangers and assumes that the total wealth is known; or the result could be supplemented by other methods.

2 DISTRIBUTION OF PROBATED ESTATES

At the end of the last century C. D. Wright, M. O. Lorenz, and C. B. Spahr made use of available state probate records in Massachusetts, Wisconsin, and New York to estimate the *distribution of estates*.⁸ The results must be differentiated from a distribution of wealth. The dispersion of decedents' estates gives at best but a hint as to the latter. In 1915 W. I. King elaborated the Massachusetts and Wisconsin results and presented some international comparisons in his *Wealth and Income of the People of the United States*. Since the estate and income taxes became effective only in 1916, there was no possibility at that time of employing the estate-multiplier method or the income-capitalization approach. But later, despite the shortcomings of the old method, the Federal Trade Commission resorted to it in the study covering 1912-23, and concluded that its sample was "sufficiently good . . . to give an approximately correct picture of the facts". No cognizance, apparently, was taken of the possibility of applying the estate-multiplier method to the estate tax statistics. Capitalizing income, on the basis of income tax statistics, was deemed impracticable. Now, however, further study of probated estates, especially the smaller ones, would prove invaluable in supplementing the income-capitalization results.

3 DIRECT CENSUS OF WEALTH

Another general method is the direct census of wealth. Australia made such a census as a war measure in 1915.⁹ The cost of a census

⁸ See C. L. Merwin, Jr., Part One, Sec. I.

⁹ G. H. Knibbs, *The Private Wealth of Australia and its Growth* (Melbourne: Commonwealth of Australia, Commonwealth Bureau of Census and Statistics, 1918), pp. 24-5, 30-1, 48-9.

is obviated, if the property tax can be taken as a presumptive measure of wealth distribution, and this method was utilized in Massachusetts and Michigan late in the 19th century and by Helfferich in his estimate for Prussia in 1908.¹⁰ But in no western country today could this presumptive method be employed, for the reasons that have led to the breakdown of the property tax itself. Nor would the expense warrant a direct census save in some emergency. The United States has made inventories of national wealth that have been of use in roundabout ways in constructing wealth distribution tables, as will be indicated below.

II Refinement of the Income-Capitalization Method

1 CONTRIBUTIONS OF INGALLS AND KING

The capitalization of income approach is inherently less desirable than the estate-multiplier or direct census methods, largely for the reasons that it excludes non-income yielding property and that it is difficult, if not impossible, to apply to the lowest income brackets. Yet it has proved the most useful method in working with the existing American materials.

W. R. Ingalls was the first to employ the technique. Critical of the conclusions concerning the distribution of wealth in the United States implied by the studies of probated estates, widely quoted in political discussion, Ingalls first challenged the results by means of what we might call the inventory method and only later brought into play income-capitalization. He made a rough division of the total national wealth, as reported by the Census and other sources, in the hands of farmers, corporations, business interests, and the public generally. "The data are fragmentary, but they are sufficient to indicate clearly the extensive distribution of wealth among the people of the United States."¹¹

This was the roughest sort of beginning. Except when combined with the income-capitalization method, based upon income tax statistics, the results are unsatisfactory and at best suggestive. This next step was likewise taken by Ingalls in an article first published in *The Iron Age*, October 4, 1923, and re-

¹⁰ Federal Trade Commission, *op cit*, p. 56n; Wedgwood, *op. cit.*, pp. 101-2.

¹¹ *Wealth and Income of the American People* (York, Pa.: Merlin, 1922), p. 199

printed in his *Current Economic Affairs*. The most refined use of income-capitalization, supplemented by other techniques, is King's estimate for the United States as of December 31, 1921.¹²

2 TYPICAL PROBLEMS OF THE CAPITALIZATION APPROACH

Some of the typical problems involved in the capitalization approach are revealed by the estimates of Lewis Corey and R. R. Doane for 1928 and 1929.¹³ Both employed substantially the same procedures as King, though in much cruder fashion. Essentially, the method is a combination of the inventory and income-capitalization approaches: national wealth as indicated by available data is distributed according to size groups by means of indices obtained from income tax statistics. For only by "skillfully combining several methods", as Lehmann described King's work of 1921, can it be hoped to obtain at all trustworthy estimates for the whole range of income classes. Only to a limited extent are property incomes directly capitalized and aggregated by income classes.

The distributions for 1928 and 1929 are, in fact, incomplete approximations. Corey's results refer only to income-yielding wealth but embrace the entire range of wealth from the wealthiest to the poorest. Doane's distribution, on the contrary, includes non-income wealth but excludes all persons below the federal income tax limits.

One limitation of the pure income-capitalization approach, namely the problem of including non-income wealth, was partly minimized by Doane (also by King) by using income tax statistics chiefly for the purpose of obtaining keys for the distribution of wealth totals known from other sources. Bank deposits, insurance, individually owned houses, and all varieties of personal property, present problems to be dealt with in one way or another. Two questions are suggested: whether all personal property is counted in national wealth totals, and whether suitable

¹² The procedures used by Ingalls and King are more fully described by Merwin, Part One, Sec. I.

¹³ Lewis Corey, *The Decline of American Capitalism* (Covici Friede, 1934), p. 350. The traditional tabulation according to income or wealth classes is abandoned by Corey in favor of broad social classes, though probably with too few subdivisions. R. R. Doane, *The Measurement of American Wealth* (Harper, 1933), pp. 25, 33.

keys have been employed to allocate such property to wealth classes.

The treatment of wealth in the hands of persons below the income tax levels presents another difficulty. For this task much information is essential concerning the magnitude of different items of wealth such as farm property, bank deposits, insurance, automobiles, and other types of durable property. Some data of this type are available in agricultural, financial, and other statistics. How to make the necessary allocation, even roughly, is the problem. Unfortunately the methods used by King and Corey are not fully described, but the problem is beset with many difficulties and dangers. Some measure of extrapolation, for example, must be employed, as King indicates. If aggregate wealth is properly defined and accurately determined, with institutional and public wealth eliminated from total private wealth, some degree of extrapolation based upon available indices of distribution may be permissible; or if it is not deemed necessary to specify the distribution of wealth within the sub-classes of the non-tax brackets, the residuum may be assigned to that broad wealth stratum. As an alternative, a somewhat arbitrary figure or a special census for a single year may be taken as a norm over a period of years if it is assumed that the wealth in the lower brackets is not subject to great fluctuation. Another possibility, referred to by King, is that net income may approximate net wealth (or stand in some definite relationship to it) for the lowest strata of income recipients.

But there are other difficulties. Total national wealth estimates, as Ingalls pointed out, usually refer to physical wealth, and it is questionable whether non-physical assets of going concerns are properly reflected in such inventories. Since the capitalized earnings of corporations may exceed their physical assets, the resulting distribution of wealth appears more unequal than it is. On the other hand, capitalized earnings may be less than the physical assets counted in the national inventory, with the contrary distortion of results.

3 DISTRIBUTION OF INCOME-YIELDING PROPERTY

The theoretical and statistical problems involved in capitalizing wage incomes have deterred economists from attempting any distribution of wealth embracing human capital; and the short-

comings of a simple application of the income-capitalization technique, which excludes non-income property, are apparent. Nevertheless the distribution of income-yielding property is of importance *per se*; it is more valuable as a presumptive distribution of wealth than the familiar dispersion of the estates of the dying. Maxine Yapple has estimated the ownership of such property by income-tax brackets as a means of measuring the progression of federal taxation upon income and wealth.¹⁴ The values of the different types of payments reported for 1928-32 were capitalized by yield rates representing, in most cases, an average for a complete business cycle. The present writer has recast her results in the belief that they are of interest in this connection; her study is the only thorough application of a strict capitalization approach.

The critical problem in this approach, other than the inclusion only of income-yielding property of the higher income brackets, is clearly the rate of capitalization to be applied to various types of property income. Adequate statistical data are lacking on the rate of yield of the different types of income-earning property and on changes in these rates over time. Data on the yield of corporate stocks are perhaps more abundant. Yet the indices that exist refer only to selected issues. Whether the indicated year-to-year changes in yield are representative of fluctuations in the yield of all stocks is questionable. In any case the rate of yield is but an approximation. Since the general range is known, the precise rate may not be so important, except for the fact that corporate stock is held in different proportions by individuals in the different income brackets.

Another question relates to the assumption always made that the rate of yield of common stocks or other investments is equal for all income classes. It is highly questionable that common and preferred stocks, seasoned and unseasoned issues, are held in the same proportions by the various brackets. Nevertheless there are far more difficulties connected with the rate of yield of business properties, real estate and miscellaneous properties, and rights.¹⁵

One factor of particular importance, especially in the higher

¹⁴ 'The Burden of Direct Taxes as Paid by Income Classes', *American Economic Review*, XXVI (December 1936), 691-710.

¹⁵ *Ibid*, pp. 704-7.

brackets, is the retention of profits in closely held corporations. The resulting distribution appears less unequal than is actually the case.

The results of Miss Yaple's study are summarized in Table 1. In addition to persons below the federal tax limits, this distribution excludes approximately three million of the smaller income tax returns. It does not purport to include personal property of a non-income variety, makes no allowance for debts and administrative expenses, and does not fully account for insurance. According to this table the half million income recipients with the highest incomes owned approximately \$140 billion of income yielding property. This is approximately two-fifths of the aggregate private wealth, according to various estimates of that total.

TABLE 1
DISTRIBUTION OF INCOME-YIELDING PROPERTY IN THE
UNITED STATES AS AN AVERAGE FOR 1928-1932
(derived from the study by Maxine Yaple)¹

OFFICIAL INCOME CLASS (thousands of dollars)	AVERAGE CAPITALIZED INCOME PER RETURN	AVERAGE NUMBER OF RETURNS	AGGREGATE CAPITALIZED INCOME (B X C) (millions of dollars)	PERSONS WITH INCOMES ABOVE SPECI- FIED LIMITS (COL. C CUMU- LATED FROM BOTTOM UP)	TOTAL WEALTH HELD BY PERSONS WITH INCOMES ABOVE SPECI- FIED LIMITS (COL. D CUMU- LATED FROM BOTTOM UP) (millions of dollars)
A	B	C	D	E	F
7- 10	107.5	188,305	20 26	446,391	139 359
10- 25	207.	190,856	39 51	258,086	119 099
25- 50	540	43,049	23 24	67,230	79 589
50- 100	1,140	15,753	17.89	24,181	56 349
100- 150	2,020.	3,851	7.79	8,428	38.459
150- 300	3,325	2,960	9 86	4,577	30 669
300- 500	6,750	852	5.42	1,617	20.809
500-1000	12,200	502	6.15	765	15.389
1000-2000	23,100.	184	4 25.2	263	9 239
2000-3000	37,000	40	1.48	79	4 987
3000-4000	55,500	14	.777	39	3 507
4000-5000	92,222	9	.83	25	2.73
Over 5000	118,750.	16	1 9	16	1.9

¹ *Op cit.*, p 705 The net estate data in Miss Yaple's study were adjusted by the addition of the average personal exemption for the years involved.

4 LEHMANN'S CORRELATION OF DIVIDEND INCOME AND NET ESTATES

As is evident from the fact that no year-to-year estimates of the distribution of wealth exist, the whole technique of the income-capitalization method as developed by Ingalls, King, Corey, Doane and Yapple is extremely involved. The next major contribution to the method was introduced by Fritz Lehmann¹⁶ and simplified the procedure substantially. For general purposes Lehmann's method may prove adequate for the higher brackets if the results are checked from time to time by other methods. To date its usefulness is limited by the absence of any satisfactory, or widely accepted, estimates of total national wealth, and by defects in the original data—difficulties that are shared by the other methods as well.

Lehmann described his method, which he devised to make a rough estimate for the United States as of 1930, as a "short-cut . . . combining the results of the federal income tax statistics with the results of the federal estate tax returns". The essential steps are as follows: the value of corporate stock owned by persons in each income class is estimated by capitalizing the dividend income shown on the income tax returns; the relation between the value of corporate stock owned and the net estate is estimated from the estate tax returns; this relation is then used to convert the values of corporate stock owned into estimates of the total net estate of persons in each income class.

Some of the advantages of the method are:

1. The method is simple enough to employ for year-to-year estimates of changes in the wealth of the higher brackets.
2. The result includes the value of both income and non-income yielding property which may otherwise be neglected either because of the deficiencies of the other income-capitalization approaches or because such property may be overlooked in the national wealth inventories.
3. Only one capitalization rate is required, that for dividend income, eliminating many of the difficulties arising from the de-

¹⁶ 'The Distribution of Wealth' in *Political and Economic Democracy*, ed. by Max Ascoli and Fritz Lehmann (Norton, 1937), p. 161.

termination of rates of yield for other types of property even less susceptible of estimation.

4. The method makes no assumption that the distributions of wealth among the living and dying are comparable, as is implied by the probated estate method. The critical assumption is merely that in the estates of the living and dying, corporate stock represents about the same proportion of the net estate for each income-wealth class.

III Annual Estimates of the Distribution of Wealth in the United States, for the Higher Brackets, 1922-1936

The facility of Lehmann's technique, compared with the complexities of the method developed by King, makes possible estimates over a period of years as a means of testing its usefulness. Annual estimates for the years beginning with 1922, when the necessary income and estate-tax data were available for the first time, are therefore presented in this section and compared with the earlier results in the concluding section.

1 DESCRIPTION OF THE METHOD

The derivation of these estimates involved the following steps: ¹⁷

1. The average rates of yield indicated by Standard Statistics indices ¹⁸ were employed to capitalize the dividend income reported by individuals filing federal income tax returns. ¹⁹ This

¹⁷ Cf. Gerhard Colm and Fritz Lehmann, *Economic Consequences of Recent American Tax Policy*, Supplement 1 to *Social Research* (1938), Ap. A: 'Method of Estimating the Influence of the Personal Income, Gift and Estate Taxes upon Savings and the Distribution of Wealth', prepared by the present writer, pp. 91-8.

¹⁸ Standard Statistics Co., Inc., New York, *Standard Statistics Bulletin, Base Book Issue*, 1932-34, p. 125. For 1922-25 the average rate of yield was derived from the index of 33 industrial common stocks, 20 industrial preferreds, and 20 unseasoned industrial preferreds; beginning with 1926 an index of 90 additional common stocks became available; in 1928 the index of 20 unseasoned stocks (*ibid.*, 1928-29, p. 16) was discontinued, as was the index of 33 industrials in 1929. Since 1931 there is a paucity of data. For 1931 cf. *Statistical Bulletin* (April 1934), p. 27; for 1934, *Standard Earnings* (January 1936), p. 24.

The estimated yields in percentages are as follows for the years covered: 1922, 6.4, 1923, 6.6, 1924, 6.2; 1925, 5.2, 1926, 5; 1927, 4.75; 1928, 4; 1929, 4.6, 1930, 5.6, 1931, 7, 1932, 7.4, 1933, 4.4, 1934, 4.1; 1935, 4.5; 1936, 4.5. Cf., Yapple, *op. cit.*, pp. 704-7.

¹⁹ *Statistics of Income*, 1922-36.

was done separately for each year and for each of fourteen income brackets. The brackets used include all the returns filed.

2. The average holdings of corporate stock by persons in the various income classes were obtained by dividing the aggregate corporate stock thus estimated by the number of income recipients in each class.

3. From the estate tax statistics²⁰ the average net size of estates for each official estate class was obtained by dividing the aggregate value of estates filed (allowing for no deductions except 90 per cent of the reported indebtedness) by the number of decedents in each class. Because the small number of returns in the higher brackets in any single year would make for unreliable results, the average size of estates for each year represents a three-year moving average.

4. The average holdings of corporate stock in each year in each estate class was similarly obtained as a three-year average.

5. The average corporate stock in each estate class was plotted, separately for each year, against the corresponding average net estate on a double logarithmic scale.

6. A curve drawn through the plotted points was then employed to determine the average size of estates corresponding to the average corporate stock held by persons in each income class. Two assumptions are made: that corporate stock comprises the same fraction of the estates of the dying as of the total estates of the living, and that stock holdings are closely correlated with wealth classes.

7. The average wealth of persons in each income bracket thus obtained was then multiplied by the number of persons in each class for the given year, to give the aggregate wealth for each income bracket.

8. For purposes of analysis and comparison the resulting distributions of wealth were plotted (both persons and wealth cumulatively) on double logarithmic paper. The curve may then be extended a short distance for a limited measure of extrapolation if it is desired to compare the same number of income recipients over several years, as was done in Table 2.

²⁰ *Ibid.*

2 SOME DIFFICULTIES OF THE METHOD

The chief difficulties are encountered at the extreme ends of the curve that correlates average corporate stock and average net estates. It has already been noted that it was necessary to take a three-year average of the estate data because of the few returns in the very highest estate classes. Even then the curve did not extend sufficiently far. For invariably each year's income tax returns revealed individuals whose dividends, when capitalized, exceeded substantially the corporate stock possessed by decedents included in the estate tax returns.²¹ The estimates for the income classes above \$2 million required in most instances some extrapolation of the curve discussed above in (5), and an examination of the results for the ten wealthiest income recipients will reveal great fluctuations from year to year. Nevertheless this may not be too serious for the final results. At most it may account for an error of less than 1 per cent in the total distribution. As will be indicated later, Miss Yapple's results suggest that a simple application of the capitalization approach might be used for the very highest brackets, at least as a check. ^c

The shortcomings of the estate data contribute to the problem. One reason, perhaps, why the curves derived from these statistics do not indicate estates with corporate stock as large as those parcels of corporate holdings revealed in the income returns is the fact that gifts *inter vivos* reduce the size of estates by time of

²¹ This fact suggests either the possibility of a flaw in the method or an error in the earnings factor, and to the degree that undistributed profits minimize the dividends reported for taxation, the difficulty would be enhanced. The disparity is not likely to be explained by the possibility of under-valuation of corporate stock in the estates of the deceased, provided the law is properly administered. While an error in the earnings rate is a possibility, the explanations below seem more probable: (1) While corporate stock constitutes a large fraction of the total wealth of the largest estates filed, it is possible that corporate stock comprises a larger percentage of the large estates of the living (of younger men) than of the dying. This was stated above as the critical assumption of the method. (2) The fact that total estates of the magnitude indicated for the living do not appear in the estate statistics may be explained best by gifts *inter vivos* on the part of the older generation of wealthy men, in anticipation of death (not in a legal sense). This process was facilitated by the lack of a gift tax from 1916 to 1924 and from 1926 to 1932, and by the present gift tax rate equal to three-fourths of the estate tax rate. If this is the chief explanation, the difficulty will not lead to any serious error in the results.

death. This transition, however, is reflected in the income tax data; dividends are accordingly reduced.

Because of the large exemption allowed by the federal estate tax, data are lacking for estates of less than approximately \$50,000.²² In order, therefore, to determine the size of estates corresponding to the income classes below \$5,000 the curve again had to be extended a short distance. In large measure, then, the estimates of the wealth of income tax recipients in the taxable brackets below \$5,000 depend upon a degree of extrapolation. This usually involves a large fraction of taxable persons and a considerable fraction of national wealth. It is in this connection that the method requires supplementation by other methods and, equally important, independent and accurate estimates of aggregate national wealth.

In the income tax statistics persons of widely different wealth are grouped according to their net taxable income. In the higher brackets, particularly, this means that persons with large earned incomes or capital gains are classified with persons with far larger property holdings, thus reducing the average dividends for the class. A counterbalancing factor results from the fact that undistributed profits and the exclusion of income from tax exempt securities place people of greater wealth in lower income brackets, increasing the average dividends for the class. This again is a difficulty affecting the other methods equally.

As already indicated, the important assumption is made that corporate stock represents approximately the same fraction of the net estate of the living and the dying. This does not seem unreasonable since other factors than those directly related to age groups are largely responsible for the nature of the investments of the wealthy. It is the rate of taxation rather than old age, for example, that explains the drift toward tax exempt government bonds.

The rate of yield of corporate stock from year to year is dif-

²² The estate statistics do provide, however, a small sample from year to year of estates with gross value over \$50,000 but with very small net value because of debts, etc. For this reason it is questionable how representative their composition may be assumed to be. The estimates for the income classes below \$5,000 are derived largely by extrapolation and are grouped separately for that reason. Samples of small estates (Colm and Lehmann, *op. cit.*, p. 48) indicate that bank deposits as a percentage of total estates increase rapidly in the smaller brackets.

ficult to estimate with any nice precision, but the difficulty is not peculiar to this method. No serious error will result in any given year from this factor in the allocation of wealth to the taxable classes of income and wealth; the same rate will apply to all classes. But for the complete distribution of wealth, assuming that total national wealth is known from other sources, an error in the capitalization rate will mean that too large or too small a proportion of the total will be assigned to the higher brackets relative to the others. If the dividend income of these persons amounts to \$5 billion in a certain year, a difference of 1 per cent in the rate of yield might make for a difference of \$25 billion or more in the wealth assigned to them. It seems to the present writer that this constitutes one of the chief hazards of the method, as well as of other methods that depend on capitalization of income.

Two other related questions remain. The rate of yield combines common and preferred stocks, but the various wealth brackets may hold the two types of securities in different proportions. More serious is the difficult matter of the proportionate holdings of seasoned and unseasoned stocks. As a consequence, the rate of yield obtained by the different classes may vary substantially. It might be presumed that better investment advice is available to the wealthy, but there is evidence that a random selection of investments may prove more profitable than a selection made with the best of knowledge. Likewise there is the counterbalancing consideration that taxation induces the wealthy to forego more speculative and profitable securities.

3 ESTIMATES OF WEALTH, 1922-1936

Annual estimates for the fifteen years for which data are available are presented in Table 2. The year-to-year changes in the distribution can best be observed by examination of the charts in the final section. In these charts the logarithm of the cumulative amount of wealth is plotted against the logarithm of the cumulative number of persons and the resulting points joined to yield fairly smooth curves. The 1922 curve is extremely similar to King's for 1921, intersecting it at three points (Chart 3). Similarly, for the later years of the decade the results obtained by the

method described above afford rather striking comparisons with the other available distributions of wealth in the United States.

TABLE 2
DISTRIBUTION OF WEALTH IN THE UNITED STATES

INCOME CLASS (thousands of dollars) A	AVERAGE WEALTH PER PERSON B	NUMBER OF INCOME RECIPIENTS C	AGGREGATE WEALTH (B X C) (millions of dollars) D	PERSONS WITH	TOTAL
				INCOMES ABOVE SPECIFIED LIMITS (COL C FROM BOTTOM UP) E	WEALTH HELD BY PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL D CUMU- LATED FROM BOTTOM UP) (millions of dollars) F
1922					
Below 5 ¹	6.	2,500,000	15	7,500,000	178
	8.	2,500,000	20	5,000,000	163
	20.	1,500,000	30.	2,500,000	143.
	32.7	405,789	13 278	1,000,000	113.
5- 10	65.	391,373	25.5	594,211	99 722
10- 25	190.	151,329	28 8	202,838	74 222
25- 50	500.	35,478	17 74	51,509	45,422
50- 100	1,050.	12,000	12 61	16,031	27 682
100- 150	2,000.	2,171	4 35	4,031	15 072
150- 300	3,400.	1,323	4 5	1,860	10 722
300- 500	7,000.	309	2.163	537	6 222
500-1,000	11,800.	161	1.9	228	4 059
1,000-2,000	17,800.	48	.854	67	2.159
2,000-3,000	28,000.	10	.280	19	1 305
Over 3,000 ²	114,000	9	1.025	9	1 025
1923					
Below 5 ¹	6 8	2,500,000	17.	7,500,000	197.
	10 8	2,500,000	27.	5,000,000	180.
	22.	1,500,000	33.	2,500,000	153.
	24.5	602,370	14.799	1,000,000	120.
5- 10	65.	397,630	25 8	625,897	105 201
10- 25	182.	171,801	31 2	228,267	79,401
25- 50	480	39,832	19 1	56,466	48 201
50- 100	1,070.	12,452	13 3	16,634	29 101
100- 150	2,150.	2,339	5 04	4,182	15 801
150- 300	3,550.	1,301	4 61	1,843	10 761
300- 500	6,800.	327	2 25	542	6.151
500-1,000	12,400.	141	1 74	215	3 901

TABLE 2—Cont.

DISTRIBUTION OF WEALTH IN THE UNITED STATES

					TOTAL WEALTH HELD BY PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL. D CUMU- LATED FROM BOTTOM UP) (millions of dollars)
INCOME CLASS (thousands of dollars)	AVERAGE WEALTH PER PERSON B	NUMBER OF INCOME RECIPIENTS C	AGGREGATE WEALTH (B X C) (millions of dollars) D	PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL. C FROM BOTTOM UP) E	
A	B	C	D	E	F
1923					
1,000-2,000	14,700	51	75	74	2.161
2,000-3,000	37,100	12	446	23	1.411
Over 3,000 ²	87,700	11	965	11	965
1924					
Below 5 ¹	11.2	2,500,000	28	7,500,000	253
	17.6	2,500,000	44	5,000,000	225.
	29.3	1,500,000	44	2,500,000	181
	51	302,862	15,567	1,000,000	137
5- 10	66	437,330	28.9	697,138	121.433
10- 25	181	191,216	34.6	259,808	92.533
25- 50	465	47,061	22.	68,592	57.933
50- 100	1,050.	15,816	16.65	21,531	35.933
100- 150	1,920	3,065	5.9	5,715	19.283
150- 300	3,020.	1,876	5.66	2,650	13.383
300- 500	5,860	457	2.68	774	7.723
500-1,000	10,000	242	2.42	317	5.043
1,000-2,000	15,000.	50	.75	75	2.623
2,000-3,000	44,000	15	.66	25	1.873
Over 3,000 ²	121,000	10	1.213	10	1.213
1925					
Below 5 ¹	12.	2,500,000	30	7,500,000	258
	17.2	2,500,000	43	5,000,000	228.
	31.3	1,500,000	47	2,500,000	185
	45.6	169,230	7,743	1,000,000	138
5- 10	52	503,652	26.25	830,770	130.257
10- 25	163	236,779	38.6	327,118	104.007
25- 50	260	59,721	15.8	90,339	64.407
50- 100	950.	20,958	19.9	30,618	48.607
100- 150	1,700	4,759	8.1	9,660	28.707
150- 300	2,550	3,223	8.54	4,901	20.607

TABLE 2—Cont.

DISTRIBUTION OF WEALTH IN THE UNITED STATES

INCOME CLASS (thousands of dollars) A	AVERAGE WEALTH PER PERSON B	NUMBER OF INCOME RECIPIENTS C	AGGREGATE WEALTH (B X C) (millions of dollars) D	PERSONS WITH	TOTAL
				INCOMES ABOVE SPECIFIED LIMITS (COL. C CUMULATED FROM BOTTOM UP) E	BY PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL. D CUMU- LATED FROM BOTTOM UP) (millions of dollars) F
1925					
300- 500	4,000.	892	3 57	1,678	12 067
500-1,000	8,400.	479	4 025	786	8,497
1,000-2,000	14,900.	147	2,179	307	4,472
2,000-3,000	10,400.	29	.301	60	2 293
3,000-4,000	43,000.	15	.645	31	1 992
Over 4,000 ²	84,000.	16	1 347	16	1 347
1926					
Below 5 ¹	12.	2,500,000	30.	7,500,000	300
	16.4	2,500,000	41.	5,000,000	270
	32.7	1,500,000	49.	2,500,000	229
	43.5	105,132	4 566	1,000,000	180
5- 10	71.	560,549	39 9	894,868	175,434
10- 25	180.	246,730	44.4	334,319	135 534
25- 50	500.	57,487	28 74	87,589	91,134
50- 100	1,300.	20,520	27.46	30,102	63 394
100- 150	2,100.	4,724	9 94	9,582	35 934
150- 300	3,100.	3,267	10.1	4,858	25 994
300- 500	5,400.	892	4 83	1,591	15,894
500-1,000	10,000.	468	4 68	699	11 064
1,000-2,000	14,900	160	2 365	231	6 384
2,000-3,000	40,000.	34	1.36	71	4,019
3,000-4,000	41,000.	14	.574	37	2 659
Over 4,000 ²	91,000.	23	2 085	23	2 085
1927					
Below 5 ¹	13.6	2,500,000	34.	7,500,000	331.
	17 2	2,500,000	43.	5,000,000	297.
	27.3	1,500,000	41.	2,500,000	254.
	65.1	80,403	5 247	1,000,000	213.
5- 10	67.	567,700	38.1	919,597	207 753
10- 25	210.	252,079	52.9	351,897	169 653

TABLE 2—Cont

DISTRIBUTION OF WEALTH IN THE UNITED STATES

					TOTAL
					WEALTH HELD
					BY PERSONS WITH
					INCOMES ABOVE
					SPECIFIED LIMITS
					(COL. D CUMU-
					LATED FROM
					BOTTOM UP)
					(millions
					of dollars)
INCOME	AVERAGE	NUMBER	AGGREGATE	SPECIFIED	
CLASS	WEALTH	OF	WEALTH	LIMITS (COL. C	
(thousands of dollars)	PER	INCOME	(B X C)	CUMULATED	
A	PERSON	RECIPIENTS	(millions	FROM	
	B	C	of	BOTTOM	
			dollars)	UP)	F
1927					
25- 50	640	66,123	42 5	99,818	116 753
50- 100	1,300	22,573	29 5	33,695	74 253
100- 150	2,210	5,261	11 7	11,122	44 753
150- 300	3,500	3,873	13 6	5,861	33 053
300- 500	5,600	1,141	6 50	1,988	19 453
500-1,000	10,000	557	5 57	847	12 953
1,000-2,000	16,500	194	3 2	290	7 383
2,000-3,000	24,500	55	1 342	96	4 183
3,000-4,000	43,000	22	946	41	2 841
Over 4,000 2	100,000	19	1 895	19	1 895
1928					
	8 8	2,500,000	22.	7,500,000	310.
Below 5 1	12.	2,500,000	30	5,000,000	288
	28 6	1,489,113	42 617	2,500,000	258
5- 10	62 5	628,766	39 2	1,010,887	215 383
10- 25	200	270,889	54 2	382,121	176 183
25- 50	520.	68,048	36	111,232	121 983
50- 100.	1,110	27,207	30 25	43,184	85 983
100- 150	1,900	7,049	13 4	15,977	55 733
150- 300	2,900	5,678	16 42	8,928	42 333
300- 500	4,700	1,756	8 25	3,250	25 913
500-1,000	6,400	983	6 3	1,494	17 663
1,000-2,000	14,300.	356	5 1	511	11 363
2,000-3,000	27,500	91	2 5	155	6 263
3,000-4,000	26,000.	20	52	64	3 763
4,000-5,000	43,000	18	773	41	3 243
Over 5,000	95,000	26	2 470	26	2 470
1929					
	9 3	2,500,000	23	7,500,000	300.
Below 5 1	14.4	2,500,000	30	5,000,000	277
	25 7	1,467,929	37 77	2,500,000	241

TABLE 2—Cont

DISTRIBUTION OF WEALTH IN THE UNITED STATES

INCOME CLASS (thousands of dollars) A	AVERAGE WEALTH PER PERSON B	NUMBER OF INCOME RECIPIENTS C	AGGREGATE WEALTH (B X C) (millions of dollars) D	PERSONS WITH	TOTAL
				INCOMES ABOVE SPECIFIED LIMITS (COL C CUMULATED FROM BOTTOM UP) E	BY PERSONS WITH
					INCOMES ABOVE SPECIFIED LIMITS (COL D CUMU- LATED FROM BOTTOM UP) (millions of dollars) F
1929					
5- 10	65.	658,039	42 8	1,032,071	203 23
10- 25	192.	271,454	52 1	374,032	160 43
25- 50	530.	63,689	33 7	102,578	108 33
50- 100	1,050.	24,073	25 4	38,889	74 63
100- 150	1,770.	6,376	11 25	14,816	49 23
150- 300	2,530.	5,310	13 48	8,440	37 98
300- 500	4,300	1,641	7 05	3,130	24 50
500-1,000	7,300.	976	7.12	1,489	17 450
1,000-2,000	13,100.	357	4.68	513	10 330
2,000-3,000	19,300.	67	1.29	156	5 650
3,000-4,000	24,500	32	.782	89	4 360
4,000-5,000	38,000.	19	723	57	3 578
Over 5,000.	75,000.	38	2 855	38	2 855
1930					
Below 5 1	3 2	2,500,000	8.	7,500,000	190
	4 8	2,500,000	12	5,000,000	182
	13 9	1,500,000	21.	2,500,000	170
	26.1	189,588	4 938	1,000,000	149
5- 10	56.	550,977	31.	810,412	144 062
10- 25	210.	198,762	41.8	259,435	113 062
25- 50	590.	40,845	24 1	60,673	71 262
50- 100	1,300.	13,645	17 75	19,848	47 162
100- 150	2,350.	3,111	7 3	6,203	29 412
150- 300	3,900.	2,071	8 09	3,092	22 112
300- 500	6,900.	552	3 81	1,021	14 022
500-1,000	12,700.	318	4.05	469	10 212
1,000-2,000	25,000.	110	2 75	151	6 162
2,000-3,000	42,000.	21	.882	40	3 412
Over 3,000 2	133,000.	19	2 530	19	2 530

TABLE 2—Cont.

DISTRIBUTION OF WEALTH IN THE UNITED STATES

INCOME CLASS (thousands of dollars)	AVERAGE WEALTH PER PERSON (thousands of dollars)	NUMBER OF INCOME RECIPIENTS	AGGREGATE WEALTH (B X C) (millions of dollars)	PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL. C CUMULATED FROM BOTTOM UP)	TOTAL WEALTH HELD BY PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL. D CUMU LATED FROM BOTTOM UP) (millions of dollars)
A	B	C	D	E	F
1931					
Below 5 ¹	2.8	2,500,000	7.	7,500,000	130.
	3.6	2,500,000	9.	5,000,000	123
	10	1,500,000	15.	2,500,000	114
	21.1	409,269	8.6	1,000,000	99
5- 10	51	417,655	21.35	590,731	90.40
10- 25	200.	137,754	27.6	173,076	69.05
25- 50	585	24,308	14.28	35,322	41.45
50- 100	1,320	7,830	10.35	11,014	27.17
100- 150	2,600	1,634	4.25	3,184	16.82
150- 300	4,400	1,056	4.65	1,550	12.57
300- 500	7,500	268	2.02	494	7.92
500-1,000	18,500.	149	2.762	226	5.900
1,000-2,000	24,000	54	1.3	77	3.138
2,000-3,000	41,000	12	492	23	1.838
Over 3,000 ²	122,000	11	1,346	11	1.346
1932					
Below 5 ¹	2.	2,500,000	5	7,500,000	84
	3.2	2,500,000	8	5,000,000	79
	6.	1,500,000	9	2,500,000	71
	14	643,558	9.062	1,000,000	62.
5- 10	52.	251,014	13.1	356,442	52.938
10- 25	180	79,210	14.3	105,428	39.838
25- 50	480.	18,480	8.9	26,218	25.538
50- 100	1,250	5,902	7.4	7,738	16.638
100- 150	2,750.	995	2.74	1,836	9.238
150- 300	4,800	595	2.86	841	6.498
300- 500	9,000.	140	1.26	246	3.638
500-1,000	16,500.	86	1.42	106	2.378
1,000-2,000	35,000.	15	525	20	.958
Over 2,000 ²	86,500	5	433	5	.298

TABLE 2—*Cont*

DISTRIBUTION OF WEALTH IN THE UNITED STATES

				TOTAL WEALTH HELD	
				PERSONS WITH INCOMES ABOVE	BY PERSONS WITH INCOMES ABOVE
				SPECIFIED LIMITS (COL. C	SPECIFIED LIMITS
				CUMULATED	(COL. D CUMU- LATED FROM
INCOME CLASS (thousands of dollars)	AVERAGE WEALTH PER PERSON (thousands of dollars)	NUMBER OF INCOME RECIPIENTS	AGGREGATE WEALTH (B X C) (millions of dollars)	FROM BOTTOM UP)	BOTTOM UP) (millions of dollars)
A	B	C	D	E	F
1933					
	2.8	2,500,000	7	7,500,000	110.
Below 5 ¹	4.4	2,500,000	11	5,000,000	103.
	7.7	1,500,000	11.5	2,500,000	92.
	19.	668,108	12.67	1,000,000	80.50
5- 10	69.	229,754	15.88	331,892	67.83
10- 25	231.	75,643	17.4	102,138	51.95
25- 50	630.	18,423	11.63	26,495	34.55
50- 100	1,640.	6,021	9.89	8,072	22.92
100- 150	3,150.	1,084	3.42	2,051	13.03
150- 300	5,900.	695	4.11	967	9.61
300- 500	11,000.	141	1.553	272	5.5
500-1,000	21,500.	81	1.755	131	3.947
1,000-2,000	30,000.	39	1.17	50	2.192
Over 2,000 ²	93,000	11	1.022	11	1.022
1934					
	3.6	2,500,000	9	7,500,000	138.
Below 5 ¹	5.6	2,500,000	14.	5,000,000	129.
	10.6	1,500,000	16.	2,500,000	115.
	24.5	577,353	14.09	1,000,000	99.
5- 10	74.	290,824	21.6	422,647	84.91
10- 25	240.	102,892	24.775	131,823	63.31
25- 50	700.	20,931	14.638	28,931	38.535
50- 100	1,720.	6,093	10.480	8,000	23.897
100- 150	3,750.	982	3.690.	1,907	13.417
150- 300	6,800.	690	4.7	925	9.727
300- 500	12,800.	116	1.489	235	5.027
500-1,000	24,500.	86	2.11	119	3.538
1,000-2,000	23,500.	25	.588	33	1.428
Over 2,000 ²	106,000.	8	.848	8	.848

TABLE 2—Cont

DISTRIBUTION OF WEALTH IN THE UNITED STATES

					TOTAL WEALTH HELD BY PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL D CUMU- LATID FROM BOTTOM UP) (millions of dollars)
INCOME CLASS (thousands of dollars)	AVERAGE WEALTH PER PERSON B	NUMBER OF INCOME RECIPIENTS C	AGGREGATE WEALTH (B X C) (millions of dollars) D	PERSONS WITH INCOMES ABOVE SPECIFIED LIMITS (COL C CUMULATED FROM BOTTOM UP) E	
A	B	C	D	E	F
1935					
Below 5 ¹	3 6	2,500,000	9	7,500,000	137.
	5 6	2,500,000	14	5,000,000	128
	10	1,500,000	15.	2,500,000	114
	28 5	499,885	14 269	1,000,000	99
5- 10	62	339,842	21	500,115	84 731
10- 25	193.	123,564	23 8	160,273	63 731
25- 50	580	26,029	15 1	36,709	39 931
50- 100	1,300	8,033	10 4	10,680	24 831
100- 150	2,700.	1,395	3 9	2,647	14 431
150- 300	5,000.	896	4 5	1,252	10 531
300- 500	10,000	206	2.06	356	6 031
500-1,000	17,300	109	1 89	150	3 971
1,000-2,000	33,500.	31	1.04	41	2 081
Over 2,000 ²	104,000	10	1 041	10	1 041
1936					
Below 5 ¹	7 4	2,500,000	18	7,500,000	189
	8	2,500,000	20	5,000,000	171.
	15 3	1,500,000	23.	2,500,000	151.
	34.	323,009	11.028	1,000,000	128
5- 10	64	440,866	28.4	676,991	116 972
10- 25	180.	176,649	32	236,125	88 572
25- 50	550	41,137	22 6	59,476	56 572
50- 100	1,130.	13,620	15.45	18,339	33 972
100- 150	2,100.	2,696	5.49	4,719	18 522
150- 300	3,600.	1,544	5 59	2,113	13.032
300- 500	7,700.	330	2 55	569	7.442
500-1,000	14,300.	178	1 55	239	4.892
1,000-2,000	23,000.	42	.965	61	2 342
Over 2,000 ²	72,500	19	1 377	19	1 377

¹ The estimates for the classes below \$5,000 involve considerable extrapolation.² Grouped.

4 COMPARISON OF THE ESTIMATES

The results of this and other studies, plotted on Charts 1, 2, and 3, suggest the following conclusions:

1. Except for approximately the fifty wealthiest individuals, the curves for all years are noticeably symmetrical, and, as is necessarily the case with unequal distributions plotted in this manner, are somewhat concave in all phases of the business cycle.

2. During the years of the upswing, ending in 1929, aggregate national wealth increased steadily, but no marked changes occurred in the character of the distribution. Virtually no changes in inequality occurred. During the depression years, 1930-32, there was a considerable flattening of the curve, indicating increasing inequality. With the beginning of recovery in 1933 the curves became more sharply diagonal, i.e., the left end fell somewhat and the right end moved upward. Thus it may be concluded that the capitalization of income approaches are sensitive to year-to-year changes in the business cycle and, contrary to changes in the distribution of income, inequality in the distribution of wealth is accentuated during depression years.

3. The wealth of the 7,500,000 persons with the largest incomes is shown to have increased approximately \$130 billion during 1922-28, or as much as or more than the entire national wealth increased according to any existing estimates. It is not likely that their wealth was enhanced at the expense of lower wealth classes. The sharp increases in national wealth in Doane's national wealth estimates, in excess of Kuznets' figures on capital formation,²³ seem to be confirmed. But we are here in the treacherous field of valuation. For it may likewise be argued that negative savings in depression years cannot be so great as indicated by the present curves or by the estimates of national wealth by Doane and the National Industrial Conference Board for 1930-32. This aspect of the problem requires further investigation beyond the scope of this paper. For this reason the present writer hesitates to present the results in the usual manner, namely, that certain percentages of the population possess certain percentages of the total wealth in given years.

²³ Simon Kuznets, *National Income and Capital Formation* (National Bureau of Economic Research, 1937), p. 48.

Chart 1
DISTRIBUTION OF WEALTH IN THE UNITED STATES AS ESTIMATED BY THE LEHMANN METHOD
1922 - 1929

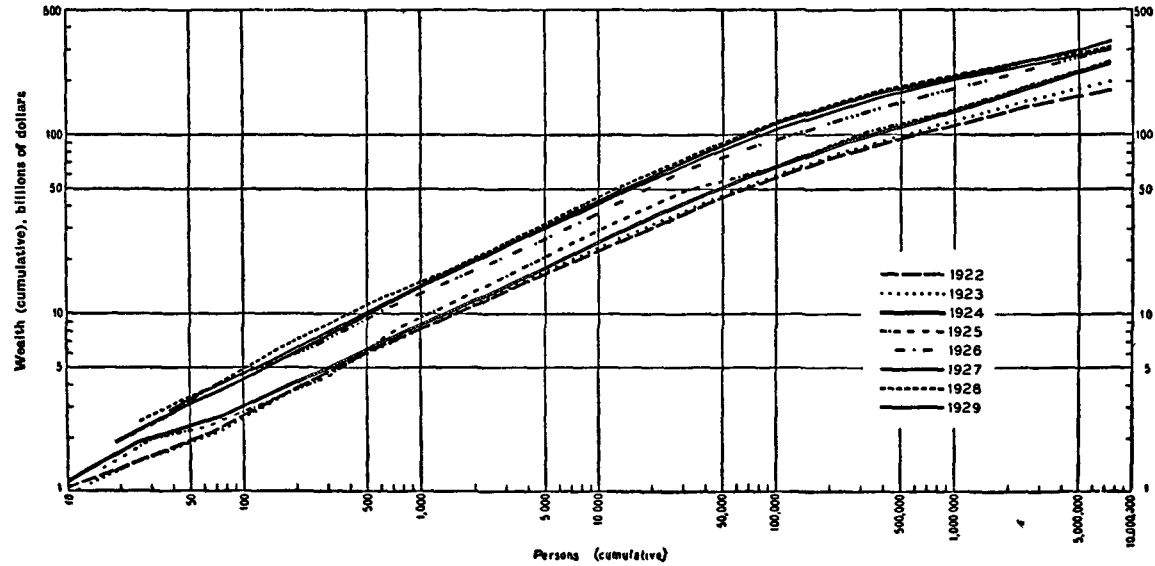
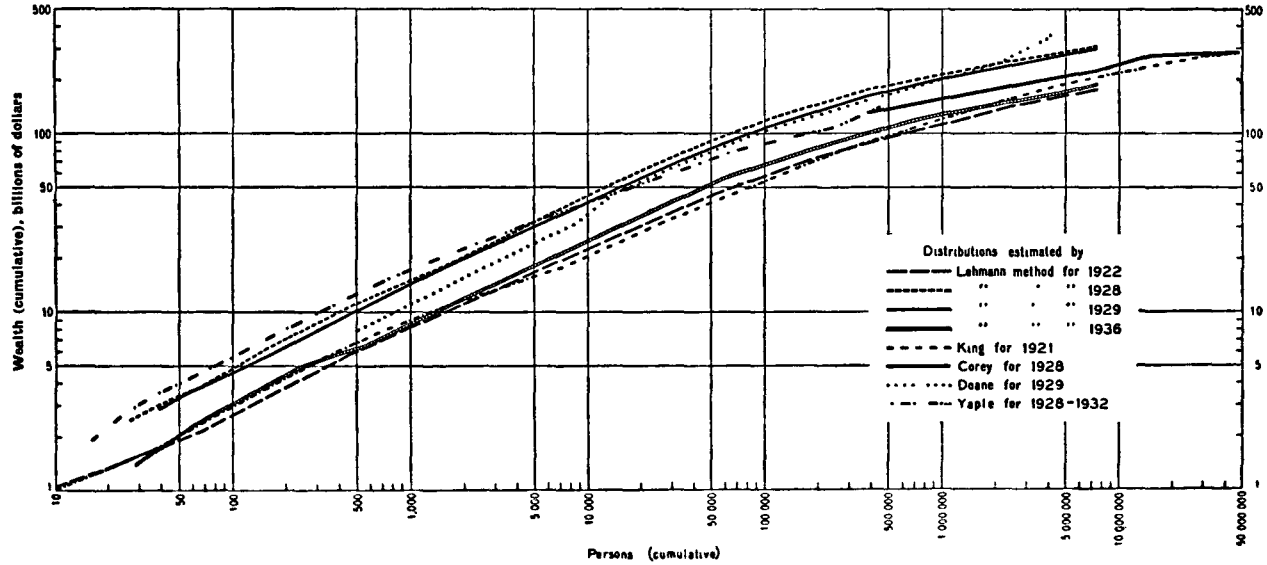


Chart 3

COMPARISON OF DIFFERENT ESTIMATES OF THE DISTRIBUTION OF WEALTH IN THE UNITED STATES
FOR SELECTED YEARS, 1921 - 1936



4. The lower two curves on Chart 3 depict King's distribution for 1921 and the present study's estimate for 1922. It has already been noted that the curves intersect at three points. If a total wealth figure of \$309 billion,²⁴ or any amount in excess of King's estimate of \$281,159 million for 1921, is assumed for 1922, the curves would again cross. The results at the points of crossing are summarized in the accompanying table. Two substan-

THE DISTRIBUTION OF WEALTH, 1921-1922

PERSONS ²⁵	WEALTH	PERCENTAGE OF TOTAL WEALTH
40	1,780,000,000	½ of 1
4,000	14,500,000,000	5
400,000	90,000,000,000	30
17,000,000	230,000,000,000	74 5 to 81 5

tially different income-capitalization methods thus give closely comparable results and confirm the rough calculations of Ingalls.

5. Corey's distribution of non-income yielding wealth for 1928 is the short solid line at the right side of Chart 3. Inasmuch as Corey did not show the stratifications within the broad social groups he employed, the first datum plotted is for the wealthiest 382,341 persons of the Upper Bourgeoisie. The curve intersects the tail of another distribution, that of Miss Yapple's for 1928-32. While neither the strict capitalization method of Miss Yapple nor the special method of the present study are applicable to the lowest classes of wealth, Corey's conclusions may be tested by the results. In the first place Miss Yapple's curve, embracing depression as well as prosperity years, is on much the same level as Corey's; for 1928 her technique would have yielded higher wealth figures than his. It is to be expected that a distribution of income-yielding wealth would be more unequal than a distribution of total wealth. But assuming that the distribution becomes more unequal in depression years, the shapes either of Corey's or Miss Yapple's curves may be questioned. One curve begins where the other ends, but the slopes are somewhat different. One would expect Corey's slope to be less flat than Miss Yapple's, or *vice versa*. Caution must be used in drawing conclusions, for they

²⁴ Derived from the estimate of the Federal Trade Commission for 1922

²⁵ King distributes the total among 40,900,000 persons for 1921. For 1922 the number of 'gainfully employed', 43,600,000 persons, is used.

can be only tentative. Again it must be said that the results are remarkably close in view of the substantially different methods.

6. Miss Yaple's figures indicate that the wealthiest brackets possess more income-yielding wealth than the estimate of total wealth for these classes in the present study. There are possibilities of error in her method, discussed previously. But, as already pointed out, the present results are most unreliable for the first 10 or more persons. A strict capitalization approach, therefore, might well be used at least as a check upon the present method in the highest brackets.

7. Doane's curve for 1929 is roughly parallel to the present study's for the same year, and would be much more similar in shape were it not for two minor arithmetical errors which account for the sharp rises in the curve. Both estimates assign an identical amount of wealth to the first million and a quarter persons. The irregularity at the right extremity of Doane's curve should be ignored, not only because it results from a slight error, but because of the shortcomings of the income tax data for the classes below \$5,000. As stated previously, Doane's estimate refers only to income tax classes and must, therefore, be supplemented by other methods.

8. Comparing the property pyramid in the United States in 1922 and 1936, one can observe no marked tendency toward increasing or decreasing equality. If the results are reliable, there is a remarkable similarity between the distributions of 1921-22 and 1936. Waiving the question of the changes in general price level, the results suggest the influence of the depression in terms of national wealth. The question of the impact of continued heavy taxation upon income and wealth in the future is another matter, but British experience indicates that the consequence is an arresting of the tendency toward increasing inequality rather than any positive movement toward increased equality. The same result is predicted for the United States in the study by Colm and Lehmann already referred to.

IV A Concluding Statement

In conclusion it may be emphasized that the most general problem, common to all methods based upon the capitalization approach, is the determination of the wealth total, which requires agreement as to the practical limitation of the definition. It cannot continue to be urged, for example, that the wealth total is meaningless if it excludes human capital. Whether the aggregates for size groups can be added together to give a total wealth figure depends upon the reliability of the methods. The results thus obtained, however, may be checked against estimates obtained by other methods. But in any case the total inventory, its definition and comprehensiveness, remains the chief general problem.

The various methods discussed are subject to certain common problems, as indicated in the text. In the first place, none of the methods today is adapted particularly to the treatment of wealth and its distribution in the lower brackets, except by means of a considerable measure of extrapolation. Lehmann's method is applicable only to the income and estate tax brackets, and must necessarily be supplemented by other methods. These other methods have not yet been devised. No substantial improvement has been made in this connection since King's estimate of 1921. It is suggested that the existing probate court records offer an important field for investigation for small estates,²⁶ though apparently small estates are not consistently probated in all states. Until more refined methods are developed for handling the problem of the lower brackets, the results of any of the methods must be rather suspect in the lower ranges. And for this country the solution of the problem by the estate-multiplier method awaits the development of an estate tax comparable to the English.

Certain other difficulties are shared by the various methods: (1) the determination of accurate average earning ratios; (2) the use of a single rate of yield for the various strata of income and wealth; (3) the many inadequacies of the income tax data—par-

²⁶ Cf. Colm and Lehmann, *op cit*, p 48

ticularly the treatment of capital gains and losses, and the influence of undistributed profits by closely held corporations.

Special difficulties involved in the Lehmann method include: (1) the various inadequacies of the estate tax data—the smallness of the sample in the higher classes, the time lag in the dates of filing and valuation, and the sharp break in the data at the lower end of the distribution resulting from the large exemptions permitted; (2) the problem of gifts *inter vivos*; (3) the assumption that the younger and older generation of wealthy individuals (i.e., the living and the dying) hold similar proportions of their wealth in the form of corporate stock; (4) the use of the regression of stock on wealth, rather than wealth on stock, in the matching process.

The present estimates of the distribution of wealth are perhaps sufficiently accurate to indicate the relative measure of wealth inequality in the United States, the smallness of any changes in inequality over fifteen years, the influence of the business cycle; and to provide materials for analysis in the field of public finance and taxation. Whatever purposes wealth distributions may be used for, accurate distributions make simpler the derivations of breakdowns of the results according to geographical divisions or estate composition when these are needed for purposes of economic analysis. This is particularly true if the wealth distributions are closely associated, statistically, with the income data.

Discussion

I MILTON FRIEDMAN

Any judgment of the adequacy of the method utilized by Mr. Stewart to derive distributions of wealth must in large part hinge on the purposes for which the distributions are desired. If the major purpose is to obtain an approximate indication of the degree of inequality of wealth in any one year or period of years, then relatively large margins of error can be tolerated. On the other hand, if the purpose is to investigate changes in inequality from year to year or over fairly short periods, much stricter standards must be applied. Our knowledge of the direction, and much less the magnitude, of such changes even over long periods is exceedingly meager. But that very fact suggests that the changes cannot be very large: if they were, even the exceedingly inadequate data available could not have failed to reveal them. Mr. Stewart's purpose seems clearly to be the establishment of year-to-year changes in the distribution of wealth; else he would scarcely have computed the distribution of wealth in each of a period of years. If it is granted that such changes must be exceedingly small, then the method he employs must be judged by strict standards, with even relatively minor biases worthy of attention.

The method devised by Professor Lehmann and employed by Mr. Stewart rests on two sets of data: one derived from federal income tax data, the other from estate tax data. The income tax data show the number of individuals and the average amount of dividends received in each of a large number of income classes. The estate data show the average value of the corporate stock held by estates in each of a large number of estate or wealth classes. These two bodies of data are combined by capitalizing the average amount of dividends received by individuals in each income class, entering the estate table with the resultant esti-

mates of value of corporate stock, and determining the average wealth of the classes that own those amounts of stock. The individuals in each income class are then attributed the average wealth of the wealth class that owns the same average amount of stock. The class intervals of the final wealth distribution are thus stated in terms of amounts of income, and the number of individuals in each class is the same as the number of income recipients in the original income table.

The difficulties with this method are of two types. There are, first, the difficulties arising from the character and reliability of the data: the difficulty of accurately estimating the capitalization factor, the empirical necessity of using the same capitalization factor for all income classes; the fewness of the returns in the very high, and the absence of any returns in the very low, wealth classes and the consequent necessity of extrapolation; the decidedly different age distribution of the individuals covered by the estate data and those covered by the income tax data; the use of figures based on unaudited returns; the biased nature of the sample of individuals filing income tax returns; the absence of a wealth total that might be employed to correct at least partly for this bias; the conceptual difficulties with the income total used to classify individuals by income classes; and so on. Second, there are the difficulties inherent in the method that could not be removed by any conceivable improvement in the data employed.

The comments that follow are restricted almost exclusively to the difficulties of the second type, although some consideration will be given to one aspect of the character of the data—the treatment of capital gains in the income concept—that seems to be of crucial importance for the measurement of year-to-year changes by the Lehmann method. Practically all the difficulties of the first type are mentioned and adequately discussed by Mr. Stewart, while he does not deal with those of the second type. Further, the difficulties connected with the character and reliability of the data might conceivably be removed or rectified; those inherent in the method cannot.

1 DIFFICULTIES INHERENT IN THE METHOD

The difficulties inherent in the method center about the exact interpretation of the classes in the tables purporting to describe the distribution of wealth. Offhand, one is tempted to suppose that they are what they pretend to be, namely, classes of income recipients, and that the wealth assigned to a given class is an estimate of the wealth owned by individuals with incomes between the limits defining the class interval. But this interpretation which appears to be accepted by both Professor Lehmann and Mr. Stewart is, on further analysis, untenable. Before passing to this analysis, however, it may be well to point out the implications of such an interpretation, since the other methods of obtaining wealth distributions by capitalizing income, with which Mr. Stewart compares the Lehmann method, yield, in theory, essentially a distribution of wealth by income classes.

Let us suppose that we have a table showing the *wealth* owned by individuals in successive *income* classes. What relationship will such a distribution bear to one showing the *wealth* owned by individuals in successive *wealth* classes? It is clear that the former distribution will tend to show less inequality than the latter. The 10 per cent of individuals holding the smallest amounts of wealth must hold a smaller proportion of total wealth than 10 per cent of the individuals chosen on any other criterion, unless this other criterion is perfectly correlated with amount of wealth, in which case the two groups will hold the same proportion of total wealth. More generally, if individuals are classified by the amount of wealth owned, the resultant classes clearly differ with respect to amount of wealth by as much as or more than if any other basis of classification, say size of income, is used. The seriousness of this bias in the direction of showing less inequality than actually exists depends on the degree of correlation between wealth and income. The higher the correlation, the less the difference between the degree of inequality of a distribution of wealth by income classes and a distribution of wealth by wealth classes. The correlation between wealth and income is doubtless fairly high, although few data bear directly on the problem.

Chart 1 may, however, serve to illustrate the magnitude of

the difference between distributions of wealth by wealth classes and by income classes. It is based on the Australian Census of Wealth and Income taken in 1915.¹ The heavy solid line in the

Chart 1

LORENZ CURVES SHOWING DISTRIBUTION OF WEALTH
BY WEALTH CLASSES AND BY INCOME CLASSES
AUSTRALIA. 1915

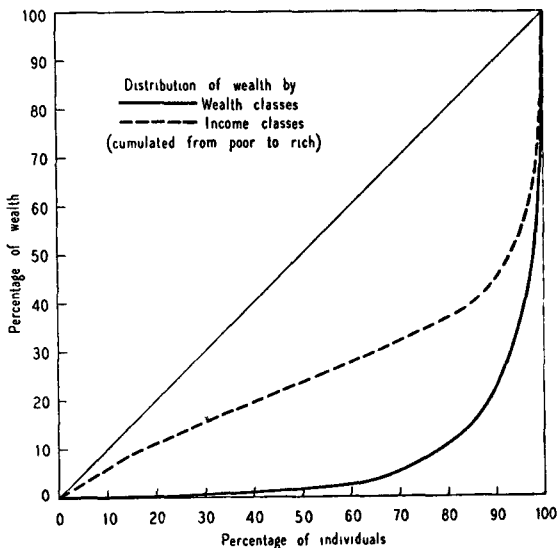


chart is a Lorenz curve based on the observed distribution of wealth by wealth classes.² The broken line is based on the distri-

¹ G. H. Knibbs, *The Private Wealth of Australia and Its Growth* (Commonwealth of Australia, Commonwealth Bureau of Census and Statistics, Melbourne, 1918), pp. 30, 31, 49. The table in this volume cross classifying individuals by size of income and of wealth suggests a fairly high but far from perfect correlation. This statement is based on visual inspection only but is supported by Chart 1.

² The Lorenz curve is a useful device for depicting graphically the degree of relative inequality. Along the horizontal axis is measured the percentage of individuals, arrayed in order of wealth (or income, etc.). Along the vertical axis is measured the percentage of the total wealth owned (income received) by the corresponding percentage of individuals. Thus the various points on a Lorenz curve indicate the proportion of total wealth owned by the poorest 1 per cent, 2 per cent, etc. of individuals. If each individual owned the same amount of wealth, it is evident that the percentage of wealth would be the same as the percentage of individuals,

bution of wealth by income classes. It gives the percentages of wealth held by successive percentages of individuals arrayed by size of income. The very marked discrepancy between the two curves suggests the extreme dubiousness of treating a distribution of wealth by income classes as an approximation to a distribution of wealth by wealth classes.³

From the viewpoint of year-to-year comparisons, the temporal stability of the correlation between wealth and income is perhaps of even greater importance than its size. For if it were stable, the bias would be approximately constant, and year-to-year changes in the distribution of wealth by income classes might reasonably be taken to reflect year-to-year changes in the distribution of wealth by wealth classes. Unfortunately, this convenient assumption cannot be made. The amount of wealth owned by an individual is probably typically far more stable over time than the amount of income received; and the 'probably' can be converted into 'almost certainly' if income is defined to include capital gains and/or losses, as it is in the income tax figures. The degree of correlation between income and wealth can thus reasonably be supposed to vary considerably from year to year; and, as a consequence, the bias inherent in using a distribution of wealth by income classes is also subject to considerable variation. Year-to-year changes in such distributions can thus not be assumed to reflect year-to-year changes in the distribution of wealth by wealth classes without a careful analysis of the magnitude of the bias relative to the magnitude of temporal changes in the latter distribution, an analysis that and that the Lorenz curve would be a straight line. The straight diagonal lines in the charts are thus designated the lines of equal distribution. The greater the divergence between the Lorenz curve and the line of equal distribution the greater the inequality (M. O. Lorenz, 'Methods of Measuring the Concentration of Wealth', *American Statistical Association Publications*, New Series, No. 70 (June 1905), pp. 209-19).

³ The early part of the broken curve in Chart 1 will appear strange to those accustomed to Lorenz curves: the first two segments of the curve have steeper slopes than the next. This is of course impossible if the vertical axis measures the percentage of the characteristic by which the individuals are arrayed—as with the solid line. It is entirely possible however when, as with the broken line, the individuals are arrayed by a different characteristic. It reflects the fact that the average wealth of the two lowest income classes—those with incomes below £50—is greater than that of the next income class, presumably because the intermediate income groups derive a considerably greater proportion of their income from earnings than the very low income groups.

may well be impossible without data that would make the whole procedure unnecessary.

As already indicated, these remarks are to some extent directed against a 'straw man'. The Lehmann procedure does not yield a distribution of wealth by income classes. To obtain an approximation to this distribution it would be necessary to combine the income and estate tax data in a different fashion than is done in the Lehmann method. Most nearly exact would be the utilization of a cross tabulation of the income tax data showing the number of individuals receiving dividends of various amounts by income classes. The average amount of stock owned would be determined by capitalization. The average wealth of individuals owning the average amount of stock held by each dividends-income class would then be ascertained, weighted by the number of individuals in each class, and added for each income class. This would involve employing the regression of wealth on stock rather than the regression of stock on wealth, the one employed in the Lehmann method.⁴ A less exact procedure, but one that would presumably though not necessarily yield a closer approximation than the Lehmann method, would be to eliminate the step requiring a cross classification, but to use the regression of wealth on stock. Stated differently, this procedure would require the computation from the estate tax data of a table showing the average wealth of individuals owning various amounts of stock, and the use of this table in combining the income and estate tax data.

The Lehmann method matches each wealth class with the income class that holds the same average amount of stock. It is exceedingly difficult to give a simple and unambiguous interpretation to this matching process. In the light of the preceding remarks, it seems clear that it does not give the average wealth held by individuals with the specified income. Nor would it necessarily seem to give the wealth class that occupies the same position in a classification of individuals by amount of wealth that the income class occupies in a classification of individuals by size of income. Offhand, we might expect the result to be

⁴ In practice, of course, the truncated nature of the distribution of the estate tax returns by amount of wealth would make exceedingly difficult and treacherous the computation of a regression of wealth on stock

some mixture of these two and hence the Lehmann procedure to yield a distribution more unequal than the distribution of wealth by income classes, but less unequal than the distribution of wealth by wealth classes. However, the statistical tests described below contradict the last of these conclusions: though in the three tests made the distribution obtained by the Lehmann procedure is uniformly more unequal than that analogous to a distribution of wealth by income classes, in one of the tests it is also more unequal than that analogous to a distribution of wealth by wealth classes. Thus our present conclusion must be exceedingly tentative: the distribution obtained by the Lehmann procedure may be expected to show greater inequality than a distribution of wealth by income classes; we have no reason to expect it to approximate a distribution of wealth by wealth classes but cannot state whether or in what way it will consistently differ from such a distribution.

If this conclusion is valid it means that, for the purpose of obtaining an approximate indication of the degree of inequality in the distribution of wealth, the Lehmann procedure has at least one very important advantage over the other capitalization of income approaches. The latter attempt to approximate a distribution of wealth by income classes and as a result have a very definite bias in the direction of suggesting less inequality than actually exists. The Lehmann procedure, on the other hand, may yield results showing either less or more inequality than actually exists; if the result shows less inequality than actually exists the difference will be smaller than if one of the other methods had been used. This advantage may, of course, be counterbalanced if the possible magnitude of error in the Lehmann method when it shows greater inequality than actually exists is fairly large; but on this point we do not have enough evidence to speak with any confidence. It should be noted that these considerations are only indirectly relevant if the Lehmann procedure is used to study year-to-year changes. For this purpose the relevant question is the temporal constancy of the bias or error in the various methods.

The statistical tests referred to were made with two sets of data. One set consisted of figures on the incomes from independent professional practice of about 1,400 physicians in 1932,

1933, and 1934. The second set consisted of similar figures for about 1,000 dentists.⁵ For each set of data tables were available cross classifying the professional practitioners by their income in different years, e.g., size of income in 1933 by size of income in 1932. In performing the experiments for which results are presented professional income in 1933 was treated as analogous to the income reported on income tax returns, professional income in 1932 as analogous to the value of stock held (i.e., as analogous both to the capitalized value of the dividends reported on income tax returns and to the value of the stock owned reported on estate tax returns) and professional income in 1934 as analogous to wealth (i.e., value of estates). Two tables were therefore constructed for each profession, one showing average income in 1932 by 1933 income classes, the other showing average income in 1932 by 1934 income classes. The Lehmann method was then utilized to derive from these tables the estimated distributions of income in 1934 to compare with the known distributions.⁶ In addition, a third test was made utilizing the data for physicians but treating income in 1932 as analogous to the income reported on income tax returns and income in 1933 as analogous to the amount of stock owned. The results of this test were intermediate between those of the other two and therefore are not presented: the Lehmann procedure yielded a distribution very close to the correct one.

These experiments are designed to test solely the bias inherent in the method. None of the difficulties arising from the character or reliability of the data is present: capitalization is unnecessary; since the tables cover the whole range of incomes, extrapolation is not required; since the several bodies of data all relate essentially to the same individuals,⁷ they are completely free from error arising from non-comparability. Further, even

⁵ These data were obtained from returns to questionnaire studies made by the Department of Commerce and are described more fully in Simon Kuznets and Milton Friedman, 'Incomes from Independent Professional Practice, 1929-1936', *Bulletin* 72-73 (National Bureau of Economic Research, February 5, 1939)

⁶ In applying the Lehmann procedure the actual average incomes in 1932 for each 1933 income class were used. In converting these averages into estimates of 1934 income a linear regression of 1932 income on 1934 income was employed.

⁷ There are slight differences because some individuals reported their incomes in 1932 and 1933 but not in 1934, others their incomes in 1933 and 1934 but not in 1932, and so on. But these differences are of very minor importance.

from the purely technical side, the data are exceedingly favorable to the Lehmann method. The correlations between incomes in the different years are extremely high; ^a and, I suspect, are higher than the correlations between income and dividends, wealth and amount of stock owned, or income and wealth. Finally, the fact that the data relate to the same individuals, while listed above as avoiding difficulties connected with the character of the data, also obviates a difficulty inherent in the method. If the wealth and income data related to the same groups of individuals there would be no need to utilize the Lehmann method: the observed wealth distribution would provide a more satisfactory answer.

Chart 2 presents the results of these experiments. The heavy solid lines are the Lorenz curves for the actual 1934 medical and dental distributions: the 'correct' distributions the Lehmann method is designed to approximate. The dotted lines are Lorenz curves based on distributions of 1934 income by 1933 income classes. They are analogous to distributions of wealth by income classes and are the distributions which, according to the interpretation accepted by Professor Lehmann and Mr. Stewart, are approximated by the Lehmann method. In accordance with the above discussion, the dotted lines in both cases indicate considerably less inequality than the solid. Finally, the broken lines are Lorenz curves based on the 1934 distributions obtained by the Lehmann method. For dentists, this line is intermediate between the other two. For physicians, on the other hand, the broken line shows greater inequality than either of the other two. The fact that the errors are in opposite directions in the two cases is peculiarly important in evaluating the usefulness of the Lehmann method in studying year-to-year changes since it suggests that the error may display little temporal stability.

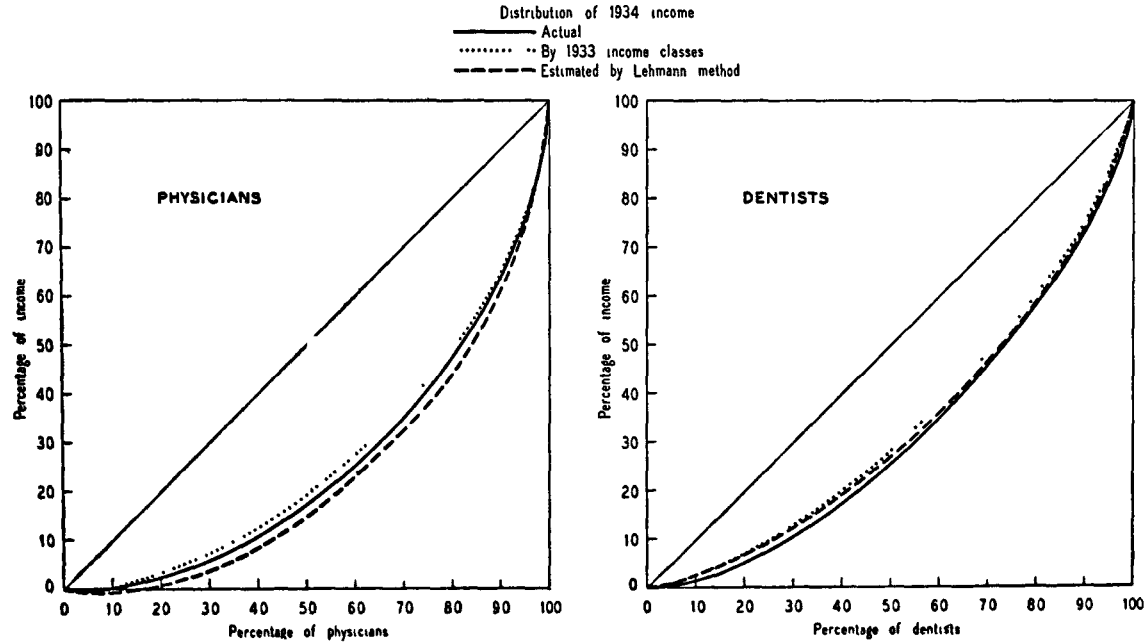
Offhand, the errors suggested by Chart 2 may not seem particularly great. As emphasized above, however, their importance can be judged only by comparison with the differences in equality that it is desired to study. In the present instances these differ-

^a The correlation coefficients for physicians and dentists are as follows:

YEARS COMPARED	CORRELATION COEFFICIENT	
	PHYSICIANS	DENTISTS
1932 and 1933	.92	.94
1933 and 1934	.95	.94
1932 and 1934	.89	.91

Chart 2

COMPARISONS OF DISTRIBUTIONS OBTAINED BY THE LEHMANN METHOD WITH OTHER DISTRIBUTIONS
LORENZ CURVES BASED ON DATA ON INCOMES OF PHYSICIANS AND DENTISTS



ences are exceedingly small: for both dentists and physicians, the Lorenz curves for 1932 and 1933 practically coincide with the one for 1934 on Chart 2. If the three curves were drawn on a chart the size of Chart 2 it would be impossible to distinguish them. Thus the divergent Lorenz curves in Chart 2 are all obtained from distributions whose Lorenz curves are practically identical.

2 INCLUSION OF 'CAPITAL GAINS' IN INCOME REPORTED ON INCOME TAX RETURNS

The treatment of capital gains and losses on income tax returns is one of the deficiencies of the data utilized by Mr. Stewart that is perhaps most important for the purpose for which his distributions have been derived and at the same time has been least adequately discussed by him. The exact treatment of capital gains and losses has varied over the period covered by Mr. Stewart's estimates, but in general the net income figure used in classifying the returns includes capital gains in whole or in part, while for most of the period losses have not been deducted. The effect of this treatment of capital gains and losses on the changes in inequality of *income* shown by income tax data is clear: it tends to make for greater inequality in prosperous years when capital gains are important than in depressed years when capital gains are unimportant and losses are unrecorded.

The effect of this definition of income on the inequality of wealth shown by distributions derived from income tax data by the Lehmann method is more complicated and, strangely enough, in exactly the opposite direction. As noted by Mr. Stewart, the inclusion of capital gains means that during prosperous years the high income groups include many individuals with large receipts from this source and hence with relatively small receipts from dividends. During depressed years, there will be few such individuals and consequently the higher income groups will derive a relatively larger proportion of their income from dividends. The estate tax data will presumably be little affected by capital gains.⁹ Consequently, the high income classes will

⁹ Whether and how they will be affected will depend on how the increases in wealth from realized capital gains are distributed among various forms of assets

be matched, during prosperous years, with relatively low wealth classes (those owning the same average amount of stock) and, during depressed years, with relatively higher wealth classes. This introduces a bias that tends to make distributions of wealth derived by the Lehmann method less unequal during prosperous than during depressed years. This bias may be somewhat offset by the direct bias in the original income distribution. The statements about the bias in the estimated wealth distributions do not depend on whether the concept of income that is accepted as the basis for income distributions includes or excludes capital gains or losses. Though personally I should, for most purposes, support an income concept that excludes capital gains or losses, the acceptance of an opposite view in no way affects the preceding argument. And parenthetically, it may be indicated that in view of the difference in the treatment of gains and losses, the bias noted in income distributions based on income tax data is also unaffected by the concept of income accepted.

These comments gain added point in the light of Mr. Stewart's conclusions about the cyclical behavior of the inequality of income and wealth. He states that "contrary to change in the distribution of income, inequality in the distribution of wealth is shown to be accentuated during depression years".¹⁰ Thus, the changes he notes in the inequality of both income and wealth are in the direction that, in the absence of any 'real' changes, the treatment of capital gains and losses might be expected to produce.

3 CONCLUSIONS

The statistical experiments outlined above suggest the existence of a definite error inherent in the Lehmann method of estimating the distribution of wealth. This error can hardly be expected to be constant from year to year, and indeed the experiments suggested that it might vary considerably in direction. These experiments, moreover, were heavily weighted in favor of the Lehmann method. In practice, the errors might be expected to be considerably greater, even with entirely accurate data. If to this technical difficulty we add the many and serious deficiencies in the data employed, the conclusion inescapably

¹⁰ Point 2 in Sec III, 4.

emerges that the Lehmann method is useless for the purpose of studying short period changes in the distribution of wealth—the purpose for which Mr. Stewart utilized it.

Mr. Stewart reaches a conclusion exactly the reverse of the one just stated: “that the capitalization of income approaches are sensitive to year-to-year changes in the business cycle”.¹¹ But this conclusion seems to be based entirely on the irrelevant fact that the distributions he derives vary from year to year. The relevant question is whether these variations reflect changes of the same magnitude and direction in the underlying distributions of wealth that his estimates are designed to approximate.

Our conclusion as to the uselessness of the Lehmann method in studying short period changes does not mean that the method may not be useful for other purposes. Indeed our incomplete analysis suggests that for the purpose of obtaining an approximate indication of the degree of inequality it is superior to the other capitalization of income methods since, while subject to error, it is seemingly not subject to a consistent bias. This conclusion is, however, based solely on the technical characteristics of the methods and does not take into account differences in the adequacy of the data needed for the different approaches. Moreover, even on the technical side, it rests on a seriously incomplete analysis and may be reversed by further evidence.

II W. L. CRUM

I am much interested in Mr. Stewart's method, and hope to examine it later with care. I am still sanguine about its possibilities, despite certain serious obstacles, including the 'correlation' element mentioned by Mr. Friedman which greatly impresses me. I am tempted to raise some small points:

1. The estate tax data cover a small number of cases in any one year, and that number is strikingly small in high size classes. Hence, the danger of sampling errors in these high classes, as they are used to calculate ratio of stocks to total assets, is very great. This risk is only partly reduced by the curve-fitting operation and it becomes particularly important in the year-to-year comparisons stressed by Mr. Friedman.

¹¹ See point 2 in Sec. III, 4.

2. The securities in the estate tax figures are usually valued at market, until recent Acts, at date of death. This implies that the capitalization factor should aim to produce *market* values of stocks held by income recipients. This necessity greatly increases the task of determining the capitalization factor in each year.

3. In general, it may be necessary to use a varying capitalization factor from income class to income class. Different income classes may hold varying proportions of stocks, as between dividend payers and others and as between those paying high and those paying low dividends. The income tax law itself may produce a bias of this sort, and other causes of bias may exist about which we may know little. I regard the whole determination of capitalization factors as highly uncertain.

III FRITZ LEHMANN

When I used the method of combining the results of the income tax statistics with the results of the estate tax statistics in order to estimate crudely the distribution of national wealth, I did not expect that this trick would be found worthy of scientific discussion. The use I made of this method has been questioned in Mr. Stewart's paper. He believes that the margin of error in computing total wealth figures is too great to admit of any conclusion as to how great a percentage of total wealth is owned by one group. I am somewhat more optimistic than he, but since it is a change in the distribution of wealth that is under debate, this is not a suitable opportunity for giving my reasons in greater detail.

If the other methods of obtaining wealth distributions by capitalizing income are compared with the combination method I used, the decision as to which deserves to be rated higher depends on the weighing of some advantages and disadvantages. The combination method has the disadvantage of applying the distribution of property in estates to the property of all living people. It is possible that the wealth of an average living person is invested in a manner quite different from the wealth of deceased persons.

Another disadvantage follows from the fact that *Statistics of Income* groups income receivers according to income, including capital gains. If people with high capital gains are supposed to be people with a preference for stocks, the effect may be that the holding of stocks is over-rated in the higher income groups and under-rated in the lower income groups. But this effect may be offset first by the fact that the members of the wealthier class into which capital gains lift an income receiver of smaller means tend to invest a higher percentage of total property in stocks, second, by the possibility that the realization of capital gains may frequently result in a shift from stocks to other forms of property.

There is a third difference between the two methods which Mr. Stewart believes favors the combination method, while I am inclined to hold the opposite view. The combination method uses only the yield on stocks; this yield is used to estimate the value of the stock owned and from this figure is derived the value of all property of a group of income receivers. The capitalization method has to apply several yields: for stocks, for interest-bearing property, for real estate, and for business. In addition to increasing the difficulties of computation, the use of several yields increases the number of possible errors. On the other hand, the combination method magnifies every mistake committed in estimating the yield of stocks. This is particularly important for the lower income and wealth groups for which stocks constitute only a minor part of all property.

A final disadvantage of the combination method results from the fact that there is a wide variance in the date of death of those for whom estate tax returns are filed in a particular year.

But against all these drawbacks the combination method possesses the very important advantage that it accounts for all property, not only for property that yields taxable income. The grouping of kinds of property in the federal estate tax statistics does not admit of a clear segregation of such items. It is not unlikely however that 30 to 40 per cent of the value of all estates for which returns were filed, say in 1934, consisted of property that yielded no income subject to federal income taxation. The greater the preference of the wealthier groups for liquid bank

deposits, insurance, and tax-exempt securities, the greater will be the advantage of the combination method.

This comparative evaluation of the other capitalization approaches and the combination method takes no account of those criticisms to which both methods are equally exposed, criticisms that center in the objection that reliable results as to the distribution of wealth among different wealth groups can never be obtained from income tax statistics.

IV CHARLES STEWART

Mr Friedman was not unjustified in his impression that I was interested in the utility of employing the Lehmann method for obtaining year-to-year changes in the distribution of wealth. Nevertheless I do not attach much importance to such short period changes and, as stated in the paper, the intention of the annual estimates was chiefly the testing of the method. For it does not seem to me that the production of highly refined estimates of changes in wealth distribution from year to year possesses great value for economic analysis. Knowledge of the relative degree of inequality and of shifts in distribution over a period, such as a decade, is, on the other hand, highly important. In the absence of fuller data and more adequate methods, the Lehmann method possesses value for these purposes.

Rather basic in Mr. Friedman's discussion is the question of 'size classes'. It is perhaps something of an historical accident that every distribution of American wealth in the last twenty years has been by income classes rather than by wealth classes. Dr. King, it is true, presented his final results by wealth classes, by converting the distribution by income classes into wealth classes, but in such a way that the conversion was purely one of nomenclature. Mr. Friedman is entirely correct in pointing out, with illustration from the Australian material, that the two distributions are widely divergent. Accidental though it may have been, the result, I think, is quite fortunate: for most purposes for which wealth distributions may be employed, it is highly desirable that they be linked to income distributions. There is no *a priori* reason why income distributions should be by income classes and

wealth distributions by wealth classes. It is important, however, that we be aware of the difference. Consequently I made no effort to convert the present estimates, as Dr. King had done, because I was impressed with the advantages of obtaining results tied closely to the income brackets of *Statistics of Income*.

The ingenious statistical experiments presented in Mr. Friedman's discussion, designed to test whether there is an inherent bias in the Lehmann method, show two results: (1) that the Lehmann method produces a distribution more unequal than a distribution by income classes;¹ (2) that the result may be either more or less unequal than a distribution by wealth classes. The first conclusion is relevant, the second is not. For it is no advantage of the Lehmann method, as Mr. Friedman suggests, that it may sometimes give a result closer to a distribution by wealth classes. But if Mr. Friedman's interpretation that the Lehmann distribution is not precisely identical with a distribution by income classes is correct,² it is then a highly important conclusion that there is a consistent bias inherent in the method in the direction of greater inequality, as indicated in (1) above.

One result to be hoped for from the present discussion is that the Treasury Department will undertake the tabulation of estate tax returns classified by size of corporate stock holdings. The ambiguity of the meaning of the matching process, referred to by Mr. Friedman, arises from the lack of data. This perhaps is an illustration of the fundamental difference between Mr. Friedman's and my approaches to the problem. I have attempted estimates on the basis of the available statistical materials and the techniques open to an individual investigator, in the belief that there is urgent need for even approximate results in this field. Many of the data are rough and defective, and there are many gaps. The combination of the income and estate tax data, by the matching process, would escape the difficulties described by Mr. Friedman if tabulations existed for (1) income by dividend classes and (2) wealth by stock classes. The former was published for the first time for the 1935 returns; the latter tabulation is not included,

¹ See Mr. Friedman's argument that the Lehmann distribution is neither 'by income classes' nor 'by wealth classes'.

² Because in the matching process the regression of stock on wealth, rather than wealth on stock, is necessarily employed in the absence in *Statistics of Income* of a tabulation of wealth by stock holdings.

to my knowledge, in the proposed program of the Works Progress Administration Income Tax Study.³

While admitting the possibility of a bias, I cannot agree with Mr. Friedman that the Lehmann method "does not give the average wealth held by individuals with the specified income". It aims to do that, but the result is only an approximation. What the margin of error may be depends in part upon the use of an average for capitalized dividends for each income class. The 1935 tabulation indicates that while there are substantial disparities in the amount of dividends received by individuals in the various income brackets, there is, nevertheless, a marked regularity in the data. How great a bias is introduced by the use of the regression of stock on wealth rather than wealth on stock is another consideration. Though the number of returns in the highest estate brackets is too few, there is a marked regularity in the curve correlating wealth classes and stock holdings (i.e., stock on wealth). What the Lehmann method does is to match capitalized dividends for the various income classes with corresponding amounts of corporate stock possessed by individuals possessing amounts of wealth indicated by the estate tax returns.

The results obtained by this 'short-cut' method are rather close to those obtained by King and others by more complex methods. While King's estimate as of December 31, 1921 was subjected to sharp criticism, it seems significant to the writer that the present estimate for 1922 is virtually identical with it. The real shortcoming of the method, likewise true of any capitalization approach, is that it applies only to income tax brackets.

At the same time many difficulties derive from the data. These have been mentioned by Professors Crum and Lehmann and by Mr. Friedman. Capital gains and losses represent a serious problem, and Mr. Friedman is quite correct in concluding that their influence may well account for the changes in inequality noted in different phases of the business cycle. Until recently, however, the relevant data in *Statistics of Income* have not been such as to allow any corrections for this factor. Examination of the new tabulations appearing for 1935 and 1936 indicates that the refinements that could be made would alter the shape of the curve appreciably only in exceptional years.

³ Such a regression of wealth on stock might be of little value, as Mr. Friedman suggests, because of the high exemption allowed by the present estate tax law.

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

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SELMA FINE

NATIONAL RESOURCES PLANNING BOARD

Discussion

A. J. GOLDENTHAL

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UNITED STATES DEPARTMENT OF COMMERCE

THE USE OF INCOME TAX DATA IN THE NATIONAL RESOURCES COMMITTEE ESTIMATE OF THE DISTRIBUTION OF INCOME BY SIZE

ENID BAIRD AND SELMA FINE

I Statement of the Problem

ANY discussion of the use made of federal income tax data in deriving the estimated income distributions presented in the National Resources Committee report *Consumer Incomes in the United States* should start with a clear understanding of the particular problem involved.¹ The income tax data were to be used only for obtaining the 'tail' of an income distribution, the main body of which was based on extensive primary data on family income collected in the Study of Consumer Purchases.² These data, covering the year 1935-36, constituted the largest and most representative body of sample income data ever assembled in this or any other country for the purpose of measuring the distribution of families by size of income. The necessity for using income tax

¹ This paper expands and supplements the discussion of the use of income tax data presented in the National Resources Committee report on *Consumer Incomes in the United States: Their Distribution in 1935-36* (Washington, D. C., August 1938), Ap. A, Sec. 7. This report was prepared under the direction of Hildegard Kneeland by the Consumption Research staff of the Committee, of which the present authors were members. The National Resources Planning Board (formerly the National Resources Committee) assumes no responsibility for the statements in this paper. Acknowledgment is made to Blanche Bernstein for the preliminary development of procedures for utilizing the tax data.

² A Works Progress Administration project conducted by the U. S. Bureaus of Home Economics and of Labor Statistics in cooperation with the National Resources Committee and the Central Statistical Board.

statistics arose solely from an underrepresentation of high income families among the sample income schedules actually collected in the Study of Consumer Purchases.

Inasmuch as the income data collected were specifically designed for the purpose in hand—to measure the distribution of consumer income by size—it seemed entirely appropriate that the Consumer Purchases data determine the basis of adjustment for any supplementary data used; i.e., that the income tax data be made to conform as nearly as possible to the main body of data. Otherwise the situation would have been that of the 'tail' wagging the dog.

The underrepresentation of the upper income classes is a result that can usually be expected in sample income surveys because the more wealthy families are reluctant to reveal their income status in any detail and interviewers have greater difficulties in establishing contact with them. This circumstance has not infrequently in the past, as in the present study, led to the use of federal income tax data as a basis for constructing or adjusting the upper ranges of an income distribution. Unfortunately for the National Resources Committee investigators, none of the earlier studies utilizing the income tax data for this purpose has included a detailed description of the various adjustments that must be made in the income tax statistics to transform the statutory net income classes into total income classes, and otherwise to effect comparability with those income data used in deriving the lower portions of the estimated income distribution.

II Purpose of this Paper

The actual procedures followed in adjusting the National Resources Committee estimates by means of the income tax data were fully described in the methodological appendix of the income report,³ but relatively little attempt was made to present the results of intermediate steps in this adjustment, or to evaluate the various steps in terms of alternative procedures.

This paper is intended to supplement the descriptive methodology with a somewhat more analytical discussion of the problems involved and the detailed procedures followed. Two current

³ *Consumer Incomes in the United States*, pp. 80-7.

developments in the field of income analysis make such an elaboration of methodology desirable at this time, quite apart from its possible usefulness to technicians seeking to appraise the reliability of the National Resources Committee estimates or to undertake similar estimates for later years. First of these developments is the proposal to collect family income data on the 1940 Census schedules. This proposal, involving as it apparently will an upper limit on the range of incomes to be covered, will inevitably involve the use of income tax statistics for constructing the upper range of any national distribution of income by size. The second development—which should pave the way for definitely improved procedures in the use of income tax data for such a purpose—is the intensive analysis of income tax returns for 1936 and 1937 now being conducted as a Works Progress Administration project by the Division of Tax Research of the Treasury Department. These analyses are being made on the basis of duplicate income tax returns, available for the first time for 1936. These special tabulations, although applicable to a slightly later period, will provide a very immediate means of testing the reasonableness of many of the assumptions resorted to by the National Resources Committee in utilizing the income tax data for the calendar year 1935.

By pointing out some limitations of the income tax statistics for 1935 and those previously available for 1936, and by analyzing the shortcomings of some of the assumptions and procedures used in constructing the National Resources Committee distribution, this paper can, perhaps, suggest certain points of weakness that may be revealed by these special tabulations. However, as subsequent discussion will indicate, improved tabulations of the basic data from the income tax returns would by no means have solved all problems encountered in the process of adjustment.

III Essential Differences Between Consumer Purchases Data and Income Tax Data

Before describing the series of adjustments undertaken to secure comparability between the distribution based on Consumer Purchases data and the income tax statistics, it will be well to describe

briefly the two sets of income data and to summarize the more fundamental differences between them. Notable among these was the difference in the period covered by the Consumer Purchases Study data and the income tax returns. Other major differences occurred in the items of income included and excluded from the net income figures, and in the reporting units for which the income data were compiled. The combinations and adjustments made in the income tax data to effect comparability with the Consumer Purchases data centered around these three main problems:

1. Adjusting the 1935 income tax data to take account of the increased national income during the fiscal year 1935-36.
2. Adjusting the net income tabulations from the income tax returns to include the items of income covered by the sample income data collected in the Consumer Purchases Study. An integral part of this second step was the adjustment of the income tax data to allow for the nonreporting of income by persons not filing returns, and for the understatement of income by some persons filing returns.
3. Combining and adjusting the income tax data for various types of reporting units to obtain distributions for family units, as defined in the Consumer Purchases Study.

The additional problems encountered in using the income tax data to correct the distributions for single men and women, and for families in separate regions and occupational groups are not discussed in this paper, which has been limited to a description of the methods used in correcting the national distribution for all families

1 THE YEAR COVERED

The collection of income schedules in the Study of Consumer Purchases extended from the spring of 1936 to the close of that year, with the schedules covering varying 12-month periods between January 1935 and December 1936. Since the majority of the schedules covered approximately the 12 months ending June 30, 1936, the sample income data were assumed to be most representative of that fiscal year. Population weights as of January 1, 1936 were applied to the sample data so that the final income estimates relate definitely to the year 1935-36.

Individual income tax returns, on the other hand, relate, with relatively few exceptions, to the calendar year preceding the date of filing. A negligible number of part-year returns and of returns for fiscal years ending in the period July 1935 through June 1936 were tabulated with the 1935 returns, but the tabulations relate predominantly to the calendar year ending December 31, 1935.

This discrepancy in the year covered involved a substantial adjustment in the income tax data which could have been avoided if the collection of sample income data for the lower income groups had been on a calendar year basis.⁴ The recommendation of the Conference on Research in National Income and Wealth to the Census Bureau that the calendar year 1939 be substituted for the 12-month period ending March 31, 1940 in the proposed Census collection of income data is directly relevant to this problem of comparability with the income period covered by the federal income tax returns.

2 THE DEFINITION OF NET INCOME

a) *Net income as defined in the Study of Consumer Purchases*

Income was defined in the Study of Consumer Purchases to include the total net money income received during the year by a family or single individual, plus the imputed value of certain items of non-money income. Money income comprised the net earnings of all family members, including work relief earnings, earnings from roomers and lodgers, and other paid work in the home; net profits from business enterprises operated or owned by the family; net rents from property; interest and dividends from stocks, bonds, and other property; pensions, annuities, and benefits; gifts in cash in so far as these are used during the year for current living expenses; and income received as rewards, prizes, alimony, or gambling gains. Excluded from net money income were gains and losses from the sale of capital assets owned at the beginning of the schedule year; inheritances (except that part used for current living expenses); soldiers' bonus payments and funds obtained through borrowing. The estimated value of

⁴ The Consumer Purchases Study adopted a variable schedule year, in the belief that families could report more accurately on the 12-month period immediately preceding the date of interview than on a calendar year ending some months previously.

direct relief in cash (and also in kind) was added to income in an adjustment of the relief family distributions made for this purpose by the National Resources Committee.

Business and occupational expenses, including all taxes on income-producing property and on business operations were deducted in calculating net income from earnings and from property, but personal taxes, such as income, property, and poll taxes were not deducted. Net business losses from the operation of all independent business, net losses on rental property, and money losses from sales of securities and real estate bought and sold during the schedule year were deducted in calculating net income, but no deduction was made for depreciation in the value of property owned.

Non-money income items included the net value of the occupancy of an owned home and rent received as pay, as well as the estimated value of direct relief received in kind. For farm and village families it included, in addition to these items, the net imputed value of food produced at home for the family's own use. For farm families it included also the net imputed value of certain other farm-produced goods used by the family—i.e., fuel, ice, tobacco, and wool—plus or minus the value of any increase or decrease in the amount of livestock owned or of crops stored for sale.

b) *Net income as defined in the 1934 Revenue Act*

Net income for income tax purposes is defined according to the provisions of the revenue act effective for the year for which the income tax returns are filed.⁵ These provisions ordinarily define *gross income* in terms of those items of income to be accounted for on the income tax return, and then authorize various *deductions* and *credits* which the taxpayer can claim in determining his tax liability. Statutory net income represents the amount of 'gross income' in excess of the specific 'deductions' allowed by law. These deductions, it must be emphasized, do not include the credits for personal exemption and for dependents which are

⁵ Changes in the provisions of the revenue acts affecting the definitions of net and gross income will, of course, require appropriate changes in the procedures used to effect comparability of the income tax data for various years, as well as comparability with income data from other sources

subtracted from the net income figures in determining the amount of *surtax net income*, or the earned income credit which is subtracted from the surtax net income in determining the *net income subject to normal tax*.⁶

Gross income to be reported on the 1935 income tax returns was by no means equivalent to the gross income concept followed in the Study of Consumer Purchases. There are distinct differences in the items of income included within the concept of gross income, as well as in the deductions allowed in arriving at a net income figure. The Revenue Act of 1934, under which the 1935 returns were filed, specifically excluded from gross income several types of money income covered by the Consumer Purchases Study definition and failed to enumerate such items of non-money income as the occupancy of an owned home, or the value of home-produced food. On the other hand, gross income as defined for income tax purposes includes net gains resulting from the sale and exchange of all capital assets. The Consumer Purchases data, as noted earlier, include only those gains realized on the sales of securities and real estate bought and sold within the schedule year.

Sources of income specifically enumerated on the income tax returns include: salaries, wages, commissions and fees, profits from independent businesses and partnerships, net capital gains, rents and royalties, dividends on stock of domestic corporations; income from fiduciaries, taxable interest on partly tax-exempt government obligations; other taxable interest, and 'other income'.

Specifically excluded from 'gross income' by law are: amounts received under a life insurance contract by reason of the death of the insured; amounts received from insurance and endowment contracts not in excess of the premiums or considerations paid; gifts and money and property acquired by bequest, devise, or inheritance; interest upon the obligations of a state, territory, or any political subdivision thereof, or the District of Columbia, or United States possessions, obligations listed under the Federal

⁶ Dividends on stock of domestic corporations and taxable interest on partly tax-exempt government obligations were also allowed as credits in determining net income subject to normal tax in 1935, but they are included in the *net income* figures.

Farm Loan Act, obligations of the United States or instrumentalities of the United States such as Federal Farm Mortgage Corporation bonds, Home Owners Loan Corporation bonds; amounts received through accident or health insurance or under workmen's compensation acts as compensation for personal injuries or sickness or as damages; the rental value of a dwelling house and appurtenances furnished to a minister of the gospel as part of his compensation; compensation paid by a state or political subdivision thereof to its officers or employees for services rendered in connection with the exercise of an essential government function; and amounts received as earned income from sources outside the United States (except amounts paid by the United States or any agency thereof) by an individual citizen of the United States who is a bona fide non-resident for more than six months during the taxable year.

Some of these exempted items are, of course, also excluded from the Consumer Purchases data—e.g., gifts not used for current living expenses, inheritances, and lump-sum insurance and compensation payments. Other items, notably interest from federal, state, and local government obligations, compensation paid to state and local government employees, pensions, annuities, and benefits not directly contributed to by the beneficiary, and earned income from sources outside the United States are either explicitly or implicitly covered by the data reported on the income schedules collected in the Consumer Purchases Study. Some of the minor differences in the gross income coverage are not specifically cared for in the adjustments made.⁷

In the description of the Consumer Purchases data, it was explained that losses and expenses incurred in connection with business operations and income-producing property, including all taxes levied on such business operations and property, were deducted in calculating net income. Capital losses were deductible to the extent that they were incurred from sales of

⁷ For example, no attempt was made to correct the income tax data for such items as compensation for injuries and sickness, or the rental value of a dwelling house furnished to a minister of the gospel, which were omitted from gross income as defined by the Revenue Act of 1934 and hence from statutory net income. Similarly, it was not possible to estimate the portion of capital gains that was included in the Consumer Purchases data and to allow for it in the adjustment of statutory net income for net capital gains included.

securities and real estate that had been both bought and sold within the 12-month period covered by the schedule year.

Deductions from gross income allowed by the 1934 Revenue Act were much more comprehensive. In addition to the business deductions reported in Schedules A and B, which are generally comparable to the business expenses and taxes deducted in the Consumer Purchases Study, the income tax statistics classify seven other types of deduction: business loss, partnership loss, net capital loss, interest paid (other than business interest which was included as a business expense), taxes paid (other than business taxes), contributions, and 'other deductions'.

Of these seven types of deduction the first two alone were allowed in full in the Consumer Purchases data. Net capital loss was allowed only if it had resulted from the sale of assets bought and sold during the schedule year. No taxes, other than business taxes and taxes on income-producing property, were deductible in calculating net income for the Consumer Purchases Study. The income tax requirements allowed the deduction of taxes paid on owned homes (except those assessments tending to increase the value of the property assessed), personal property taxes, and other personal taxes except federal income taxes, estate, inheritance, legacy, succession and gift taxes.

c) Summary of differences in net income classification

The inevitable result of these various differences in the concepts of gross income and in the deductions made in arriving at net income figures was a serious lack of comparability between an income classification based on net income as defined in the Consumer Purchases Study and one based on net income as defined for income tax purposes.

The major steps necessary to effect comparability in the net income figures (apart from the differences in the year and in the reporting units covered by the individual returns) can be summarized under three headings: (1) the exclusion from the income tax data of reported net capital gains resulting from sales or transfers of assets held at the beginning of the year, and the inclusion of reported net capital losses resulting from such transactions; (2) the addition to the income tax figures of the reported amounts deducted for interest paid, taxes paid, contributions and

'other deductions'; (3) the addition to the income tax figures of items of non-money income and those items of money income which were excluded from gross income as defined for income tax purposes but were included in the Consumer Purchases income data.

If we assume, as the National Resources Committee study implicitly does, that families interviewed in the Consumer Purchases Study reported their net incomes with reasonable accuracy, this third step would logically include the addition not only of the tax-exempt interest and other legally exempted items mentioned earlier, but also the addition of those amounts of income that are illegally omitted from the income tax returns by persons deliberately understating their incomes or failing to file a return.

As will be indicated later, the information necessary to effect complete comparability in income classification was not available, even if there had been unlimited time and money for special tabulations of the 1935 income tax data. The individual income tax returns contain some, but by no means all, of the separate items that would be involved in the adjustments required.

3 THE REPORTING UNITS FOR WHICH DATA WERE COMPILED

Since the Study of Consumer Purchases was planned primarily for the analysis of consumption expenditures at different income levels, the income data were collected and tabulated on the basis of spending or 'consumer' units rather than individual income recipients. Three main types of consumer units were distinguished in the National Resources Committee report, but only two—the family of two or more persons living together as one economic unit, and the single individual maintaining an independent economic status—were included in the distribution of income by size. Members of institutional groups, numbering approximately 2,000,000, were omitted from the final distribution on the grounds that they were not comparable, either in their income or expenditure status, to unattached single individuals. This omission affected the Consumer Purchases distribution only in the lower income levels and hence had no effect on the use of the income tax data for correcting the estimates.

As contrasted with the two major types of consumer units distinguished in the National Resources Committee distributions, the individual income tax returns filed with the Bureau of Internal Revenue are classified, on the basis of the sex and family relationships of taxpayers, into nine groups:

1. Joint returns of husbands, wives and dependent children, and returns of either husband or wife when no other return is filed
2. Separate returns of husbands
3. Separate returns of wives
4. Male heads of families, including single men and married men not living with wives
5. Female heads of families, including single women and married women not living with husbands
6. Returns of single men and married men not living with wives, not heads of families
7. Returns of single women and married women not living with husbands, not heads of families
8. Community property returns
9. Returns of estates and trusts

The returns in groups 1, 4, and 5 in general represent returns for family units and hence approximate most closely the family income data from the Study of Consumer Purchases. But even in these instances it is the legal relationship of dependency that determines the composition of the family unit covered by the return, not participation in a common economic existence. Supplementary incomes received by wives and by dependent children under 18 are required by law to be included in these three types of returns, but the incomes of supplementary earners other than dependents are not ordinarily covered by the family return. In some cases, even the incomes of minor children are omitted from the return because the income is not within the legal control of the family head.

If the income of a non-dependent supplementary earner exceeds the personal exemption allowed under the income tax law, a separate income tax return is required. Such returns would presumably be classified by the Bureau of Internal Revenue in groups 6 and 7, and could not be segregated from the returns of single individuals maintaining an independent fam-

ily existence. More often, of course, the 'supplementary' incomes would be too small to require the filing of separate tax returns, and no tabulation of the income tax data would afford any clue as to the amount or distribution of such income omitted from the so-called 'family' returns.

The returns in groups 2 and 3 and the community property returns in group 8 represent returns made by members of family units, but inasmuch as the separate returns of husbands and wives belonging to the same family unit were not paired by the Bureau of Internal Revenue in tabulating the 1935 data for these groups, it was not possible to reconstruct the original family units and obtain a distribution of them according to the combined family income. The pairing of husbands and wives into hypothetical family units was one of the most difficult problems presented by the use of the 1935 tax data. The special tabulations now being made of the 1936 individual income tax returns will include a tabulation of such returns on a combined net income basis, which should obviate the necessity for one of the more arbitrary steps in the adjustment of the income tax data for use in deriving a distribution of family incomes. The results of this 1936 tabulation will indicate the direction, and suggest roughly the magnitude, of the error introduced into the National Resources Committee distribution by the artificial pairing of the separate returns of husbands and wives.

The individual returns classified by the Bureau of Internal Revenue in groups 6 and 7 would presumably include all single individuals as defined in the Consumer Purchases Study, i.e., unattached individuals living alone, and those living with family groups but maintaining a separate economic existence, but would include, also, some individuals actually belonging to economic family groups and pooling their incomes into the common family fund. As suggested above, the income tax tabulations afford no basis whatever for segregating the latter group of returns. It seems reasonable, however, to assume that relatively few of those with independent incomes of \$3,000 or more would actually be pooling their incomes into the common family fund. Accordingly, no attempt was made to utilize any of the returns in groups 6 and 7 in adjusting the family distribution. Those returns showing net incomes above \$3,000 were used as

the basis for correcting the National Resources Committee estimated income distributions for single men and single women.

Income tax returns filed by estates and trusts were excluded from consideration on the grounds that the undistributed income reported in them was not a part of current consumer income, having not yet reached the hands of families and single individuals. In this respect, such income resembles undistributed corporate earnings, which are excluded from the Department of Commerce estimates of national income paid out, although they are included in national income produced.

IV Available Tabulations of the Income Tax Data

Tabulations of data from federal income tax returns for 1935 were released to the National Resources Committee in photostated form in the same detail that they were later published by the Bureau of Internal Revenue in *Statistics of Income for 1935*.⁸ These tabulations included the following basic tables:

TABLE 5: Individual returns for 1935 by net income classes and by sex and family relationship, showing number of returns and net income

TABLE 7: Individual returns for 1935 by net income classes, showing sources of income, deductions and net income; also total number of returns, and, for returns with net income of \$5,000 and over, number of returns for each specific source of income and deduction

TABLE 9: Individual returns for 1935, by state and territories and by net income classes, showing number of returns, net income and total tax; also totals for preceding years

Data on interest received from wholly and partly tax-exempt obligations, appearing in *Statistics of Income for 1935*, were also made available by the Bureau of Internal Revenue before publication, with the warning that tabulations of these data probably do not reveal the full amount of tax-exempt interest received by those filing returns. The information is compiled from data

⁸ U. S. Treasury Department, Bureau of Internal Revenue, *Statistics of Income for 1935*, Part I. Mr. Merwin is in error in assuming that the 1935 tabulations were incomplete at this time; see C. L. Merwin, Jr., Part One, Sec. II, 3, d. The tabulations regularly compiled for the *Statistics of Income* do not include a breakdown of deductions and sources of income by type of return.

contained in one of the supplementary informational schedules on the income tax return and is frequently incomplete.⁹

Complete statistics of individual income tax returns for 1936 were not available at the time the National Resources Committee estimates were prepared. Preliminary data for the returns filed during the first nine months of 1937 were available, in summary form, from two press releases issued by the Treasury Department in February and March 1938. These releases presented data on number of incomes, net income, sources of income, and deductions for all types of individual returns combined, but not for the separate groups of returns listed earlier. Even for total returns, the data were classified only by broad income classes above \$5,000 and not by the detailed income classes used in the 1935 tabulations. Had the complete tabulations for 1936 returns been available in the same detail as those for 1935 and preceding years, it would have been possible to effect a much less arbitrary adjustment of the 1935 data to allow for the effects of the increased national income during the fiscal year 1935-36.

Complete tabulations are made only from those returns showing net incomes of \$5,000 and over. The statistics pertaining to individual returns showing net income of less than \$5,000 represent estimates based on samples of such returns, and do not include information on the number of returns showing specific sources of income or deductions. Accordingly, it was not feasible, even if it had seemed desirable, to derive a satisfactory distribution based on the income tax data below the \$5,000 level.

Returns showing net incomes above \$5,000 were tabulated into 34 income classes: ten \$1,000 intervals between \$5,000 and \$15,000; three \$5,000 intervals, seven \$10,000 intervals, four \$50,000 intervals, two \$100,000 intervals, and two \$250,000 intervals between \$15,000 and \$1,000,000; five income intervals, ranging from \$500,000 to \$1,000,000 in width, between \$1,000,000 and \$5,000,000, and one open income interval for incomes of \$5,000,000 and over.

It seemed desirable, for two reasons, to carry through the adjustments of the income tax data for this entire income range. In the first place, there was no satisfactory way of determining at just what income level the under-representation of high in-

⁹ See *Statistics of Income for 1935*, p. 29.

come families began in the Consumer Purchases Study. Even if it were assumed that the data were fully representative for incomes up to \$10,000 or more, it still seemed desirable for comparative purposes to achieve as much of an overlap as possible in the income ranges covered by the two sets of data.

In the second place, it was realized that the addition of omitted items of income to adjust the income tax data would involve the shifting of returns and of aggregate income from one income level to a higher income level, and that it would therefore be necessary to drop out of the final distribution those income classes immediately above the point at which adjustments were undertaken. Thus a portion of the returns in the net income class \$5,000-\$6,000 would be moved out of the income class into the next higher class, but the adjustment would not reflect the upward shifting of returns and net income from the income class just below \$5,000. Hence in order to obtain a satisfactory income distribution above \$7,500, it was necessary to make use not only of the income tax data for the entire range above \$5,000, but in the early stages of the adjustment, of the estimated data immediately below that point as well.

V Steps involved in Combining and Adjusting the Income Tax Data

Before describing the series of steps taken to adjust the income tax data, some attention should be given to the sequence in which these various steps were undertaken and the implications of that sequence so far as the final results are concerned.

1 SEQUENCE OF VARIOUS ADJUSTMENTS

To a considerable extent the nature of the available statistical data governed the order of the various adjustments. One major consideration affecting the decision as to order was the chameleon-like nature of the net income classification as the adjustment proceeded from one step to the next. This difficulty is, of course, inherent in the problem itself and cannot be avoided by any conceivable sequence of adjustments, but it did seem possible to avoid some of the most obvious errors of logic.

One might assume, for example, that all adjustments neces-

sary to effect comparability in the net income classification should be carried through at the same time, either as one step or as consecutive steps. But available data for the various types of income to be added to or subtracted from the net income figures in the *Statistics of Income* tabulations were based on two very different income classifications. Data on capital gains, capital losses, other types of deductions, and income from tax-exempt securities were tabulated according to the statutory net income classes used in *Statistics of Income*. Data on income from supplementary family earners and on imputed income were tabulated according to the net income classes used in the Study of Consumer Purchases.

It seemed desirable, therefore, to carry through the adjustments for net income classification at two distinct stages: subtracting net capital gains and adding net losses, deductions and tax-exempt interest at the various income classes at an early stage, before the statutory net income classes had been affected by other adjustments, and postponing the addition of the income of supplementary earners and the addition of non-money income at each income level as late as possible, until the income classification had been made to correspond as closely as possible with that used in the Study of Consumer Purchases.

Since the adjustment from a 1935 to a 1935-36 basis also involved the use of comparable data from the 1935 and 1936 income tax returns, it was made at an early stage before the arbitrary adjustments for nonreporting and understatement were made.

The meaning of the net income classification at these intermediate steps of adjustment is, at best, anomalous. Thus the adjustment for nonreporting and understatement assumes a specific percentage of understatement by families with incomes between \$5,000 and \$10,000. This percentage is applied to the aggregate income of families within that numerical dollar range after adjustments have been made for capital gains and losses, deductions and tax-exempt interest and for the difference in year covered, but before adjustments for supplementary incomes and imputed values. Use of the conventional income intervals for the original assumptions as to percentages of understatement is convenient, but the procedure obviously im-

plies no fine discrimination in applying them to the income classification at that particular stage of adjustment.

It would be a mistake, therefore, to attach too much significance to the exact sequence of steps adopted in the National Resources Committee procedures.¹⁰ While a change in sequence would undoubtedly affect the statistical results to some extent, it is by no means set up as the only possible or logical sequence.

2 COMBINING RETURNS FOR FAMILY UNITS

A first objective in the income tax adjustments was to combine the various types of returns made by members of family units to obtain a single distribution of family units by size of income. In the case of joint returns, and returns made by male or female heads of families when no other return was filed (groups 1, 4, and 5), this was accomplished by simply adding the frequencies of the three types of returns at each income level. Aggregate net incomes for the three types of returns were combined in similar manner.

Before further combinations could be made, it was necessary to devise some method for transforming the separate returns of husbands and wives into equivalent family returns. This problem involved not only the separate returns of husbands and wives in groups 2 and 3, but also the community property returns in group 8, which represent either joint or separate returns of husbands and wives deriving income from property that is jointly owned.

3 DIVIDING COMMUNITY PROPERTY RETURNS

The community property returns, filed by residents of only a few states, are tabulated by the Bureau of Internal Revenue under several headings. The community property classification

¹⁰ See Merwin, Part One, Sec. II, 3, d. Mr. Merwin seems to question the logic behind the footnote in the National Resources Committee report which says, "The sequence of the adjustments for nonreporting and for understatement implies that families added to the distribution to allow for nonreporting would have understated their incomes to the same extent as did the families that actually filed income tax returns." This comment was intended merely to point out what was implicit in the arithmetic, and not as a considered opinion of how nonreporting families might have behaved in reporting their incomes. The reversal of order of these two steps would have had virtually no effect on the statistical results.

in *Statistics of Income* includes only those joint returns with net incomes of \$10,000 or more, and the separate returns with net incomes of \$5,000 or more. Joint returns of community property showing net incomes under \$10,000 are classified directly with the joint returns in group 1, and the separate returns showing net incomes of less than \$5,000 are classified directly with the returns of husbands and wives filing separate returns (groups 2 and 3).

For tabulation purposes the joint community property returns on incomes of \$10,000 or over are divided by the Bureau of Internal Revenue to represent separate returns of husband and wife. If the joint return, as filed, indicates the actual division of net income, deductions, etc., as between husband and wife, the Bureau observes this division in the tabulating procedure. If the joint return does not indicate the actual division of items, an arbitrary division is made by the Bureau, which assigns one-half of the combined net income, and of each deduction item, to the husband and the other half to the wife. The data are then tabulated as two separate returns, with the net income class of each return equal to one-half of the net income of the joint return. The distribution of returns and of net income under the community property heading is comparable in composition, therefore, to a single distribution comprising the separate returns of both husbands and wives (groups 2 and 3).

Since information was not available from the Bureau of Internal Revenue on the actual proportion of husband and wife returns at each income level in the community property classification, it seemed reasonable to split the data by applying to the number of returns and to the aggregate net income at each income level the proportions shown for the separate husband and wife returns classified in groups 2 and 3. This procedure yielded two distributions: one of the community property returns of wives, which was then added by income level to the separate returns of wives in group 2; and another of the community property returns of husbands, which was added to the separate returns of husbands in group 3.

The statutory net income reported on the returns classified under the community property grouping totals less than six per cent of the aggregate net income shown by returns of family

members with incomes of \$5,000 or more, so that the possible error introduced by this arbitrary method of division would have little effect on the final distribution of family units.

4 PAIRING INCOMES OF HUSBANDS AND WIVES MAKING SEPARATE RETURNS

Up to this point, the combination of various types of returns has proceeded on the basis of the net income classes in the *Statistics of Income*, without regard to possible differences in the kind and magnitude of deductions claimed by the various types of returns, or in the amount of capital gains or tax-exempt interest received by them. Since the tabulations of the 1935 income tax data made by the Bureau of Internal Revenue do not show the relative proportions of these items attributable to each class of return, any assumption concerning the differences by type of return would have been highly arbitrary, and it seemed simpler and quite as reasonable to accept the statutory net income classification as the basis for combining returns in groups 1, 4, and 5, postponing the adjustment for deductions and omitted items of income to a later stage.

a) *Net income adjustment for separate husband and wife distributions*

This reasoning might have led to the decision to complete the combination of various types of returns of family members on the statutory net income basis, that is, to match the returns of husbands and wives into family returns, and add these to the joint returns and the returns of family heads before correcting for capital gains, deductions, and tax-exempt income.

Actually, these adjustments of the net income classification were carried through independently for the separate returns of husbands (including community property returns of husbands); the separate returns of wives (including community property returns of wives); and the combined distribution of joint returns and returns of family heads (groups 1, 4, and 5). The adjusted distributions for husbands and for wives were then merged, by the procedures described below, into a single distribution representing family units. This new distribution of husband-wife

units was added by income level to the adjusted income distribution comprising joint returns and returns of family heads.

The decision to adjust the net income classification before completing the combination of family returns was largely arbitrary, arising from the belief that the optional division of deductions and net income items in the separate returns of husbands and wives might result in characteristic differences between these two distributions in the kinds and in the average amounts of the various income and deduction items at a given income level.

Unfortunately, even if this assumption is valid, the unavoidably arbitrary method of allocating capital gains, deductions, and tax-exempt interest among the various types of return, on the basis of the percentage distribution of aggregate net income at the various income classes, effectively leveled off such characteristic differences as might exist, and thus nullified any advantages to be gained from adjusting the net income classification before making the final combination into family returns.

The special tabulations of 1936 income tax returns now being carried on by the Treasury Department will include classifications of specific sources of income and deductions by type of return, which will reveal such differences as may exist among the various types of returns in the frequency and in the average amounts of such items, and thus provide the basis for more exact adjustments of the net income classifications for the different types of returns. The findings may suggest that the net income adjustments should be made separately for each type of return, even those in groups 1, 4, and 5, before any combinations have been made.

b) *Pairing incomes of husbands and wives*

As indicated above, the combination of the distributions of the separate returns of husbands and of wives to form a single distribution of family units was made after the two distributions had been adjusted for deductions, capital gains, and tax-exempt interest. Absence of satisfactory statistical material to use as a basis for this combination necessitated a highly arbitrary procedure in pairing the husband and wife units. Essentially, the combination was made in accordance with the general assumption that

husbands and wives making separate returns endeavor to divide the family income as evenly as possible in order to avoid the heavy surtax charges that apply at the high income levels. It should be remembered, in this connection, that the pairing scheme adopted related to a selected group of husband-wife units, and in no way reflects the relative magnitudes of the incomes of husbands and wives in general.

In the pairing scheme adopted, some of the husbands at the highest income level were assigned wives at the same level. But since the number of husbands reporting high incomes was considerably greater than the number of wives, the majority of the husbands at the highest level were necessarily assigned wives at the next lower level. Proceeding down the income scale in this fashion, every husband was paired with a wife, with the latter in most instances coming from a lower income class than the husband. Thus only at the very highest income level, where the incentive was greatest to divide incomes equally, did the method involve the pairing of husbands and wives at the same income level to form a family unit with approximately double the income of the separate returns.¹¹ For example, only about 10 per cent of the husbands with incomes between \$50,000 and \$100,000 were assigned wives with incomes within that same income range. The other 90 per cent of husbands in this class were assigned wives with incomes ranging from \$50,000 down to \$20,000. Similarly, husbands with incomes between \$10,000 and \$15,000 were paired with wives whose incomes ranged from \$7,500 to as low as \$3,500. In every case, the sum of the incomes of the paired husband and wife determined the income level of the combined family unit.

The final number of husband-wife units with incomes above \$5,000 was somewhat greater than the number of husbands filing separate returns with incomes over \$5,000, inasmuch as some husbands with incomes below \$5,000 were paired with wives whose incomes were also below \$5,000, but sufficient to bring the combined income over \$5,000 (see Table 1).

The new distribution of husband-wife units was now com-

¹¹ See Merwin, Part One, Sec. II 3, d. The National Resources Committee procedure does not require acceptance of the belief that the "majority of the so-called 'economic royalists' share their properties and incomes evenly with their wives".

bined with the distribution of other family units by adding the frequencies and the aggregate income at each income level.

c) *Alternative method of pairing incomes of husbands and wives*

The method used in creating the artificial husband-wife units is, of course, open to criticism. It might be argued that it represents an extreme among the possible methods that could have been used; that a distribution of husband-wife units derived by pairing high-income husbands with medium-income wives, and high-income wives with medium-income husbands, would have been more plausible. The results of the current Treasury analysis of 1936 returns, which will show the separate returns of husbands and wives paired into the original family units, may well indicate that some such modified procedure is desirable.¹²

Meanwhile, rather than attempt various alternative methods of combining husband and wife returns—none of which could be interpreted as a measure of the error involved in the present estimates—there has been prepared, for comparative purposes, a distribution that ignores not only the incentive offered by the income tax requirements to split the family income as evenly as possible, but also any other influences, such as similar social and economic status, which might lead high-income husbands to marry high-income wives. Under the particular circumstances presented by the income tax statistics, such a distribution represents a situation probably quite as extreme as the one presented by the National Resources Committee.

The procedure used in preparing this alternative distribution is that of pairing 90,300 husbands with incomes of \$4,000 and over with the same number of wives with incomes of \$1,000 and over by allocating to the husbands at each income level an equal number of wives drawn from income classes throughout the income range in accordance with the percentage distribution of wives filing separate income tax returns for 1935. For example, of the 16,550 husbands with adjusted net incomes between \$10,-

¹² The reader should be warned, however, against drawing a conclusion to this effect from the findings shown by tabulations of state income tax data such as those prepared in the Wisconsin study. The Wisconsin law required the filing of separate returns whenever both husband and wife are income recipients. Hence the husband and wife returns do not represent a selected group seeking to reduce tax liability by means of separate returns

000 and \$15,000, eight per cent were paired with wives having incomes between \$10,000 and \$15,000; nine per cent with wives having incomes between \$7,500 and \$10,000, etc.¹⁸ This procedure, of course, means that wives in any given income level will be paired with husbands scattered throughout the income range. The resulting distribution of husband-wife units with incomes above \$5,000 is compared in Table 1 with the distribution obtained by the methods used in the National Resources Committee study.

The total number of husband-wife units and their aggregate income are, of course, unchanged. The alternative procedure yields a distribution, however, that shows relatively fewer units at the two extremes of the income range between \$5,000 and \$1,000,000 and over, and correspondingly more units in the middle income classes. Thus, 3 per cent of the husband-wife units were assigned to the income classes above \$100,000 and 30 per cent to the classes between \$5,000 and \$10,000 as a result of the method of pairing used in the National Resources Committee study, while 2 and 17 per cent, respectively, were assigned to these two income groups as a result of the alternative procedure. At all but one of the income levels between \$10,000 and \$100,000, the latter procedure indicated higher proportions of the husband-wife units than were obtained by the methods actually used in the National Resources Committee study. In interpreting these figures it should be remembered that for the income level below \$7,500, the estimates derived by both methods are extremely tenuous, and that data for this income class were not used, as such, in the final distribution of families.

It appears that the method of combining the separate returns of husbands and wives might perhaps have been somewhat modified in line with the results shown by this alternative procedure, i.e., that the proportions of husband-wife units at the two extremes of the distribution should have been slightly reduced and those in the middle income range slightly raised. The most important effect of such a modified procedure would be a re-

¹⁸ The percentages cited can be obtained by dividing the figures in the second column of Table 1 for the relevant income classes by 90,300, the total number of wives paired with husbands. The total entered in the second column, 38,362, is solely for wives with incomes of \$5,000 and over.

TABLE 1

COMPARISON OF TWO DISTRIBUTIONS OF HUSBAND-WIFE UNITS WITH INCOMES OF \$5,000 AND OVER, BY
INCOME LEVEL, OBTAINED BY USING TWO METHODS OF PAIRING INCOMES OF HUSBANDS AND WIVES

INCOME CLASS	DISTRIBUTIONS OF RETURNS AFTER ADJUSTMENT FOR NET CAPI- TAL GAINS, DEDUCTIONS FROM GROSS INCOME, AND INTEREST FROM TAX-EXEMPT OBLIGATIONS ¹		DISTRIBUTIONS OF HUSBAND-WIFE UNITS OBTAINED BY USING NATIONAL RESOURCES COMMITTEE METHOD			
	SEPARATE RETURNS (INCL. COM- MUNITY PROPERTY RETURNS) OF HUSBANDS	WIVES	NUMBER OF HUSBAND-WIFE UNITS	PER CENT	NUMBER OF HUSBAND-WIFE UNITS	PER CENT
\$5,000- \$7,500	17,900	12,600	8,750	9 7	4,264	4 7
7,500- 10,000	14,750	7,800	18,205	20 2	10,958	12 1
10,000- 15,000	16,550	7,300	17,825	19 7	22,016	24 4
15,000- 20,000	8,450	3,300	12,388	13 7	15,042	16 7
20,000- 25,000	5,100	2,000	8,250	9 1	9,905	11 0
25,000- 30,000	3,350	1,250	6,362	7 0	6,243	6 9
30,000- 40,000	4,550	1,550	6,450	7 1	7,985	8 9
40,000- 50,000	2,550	750	3,670	4 1	4,149	4 6
50,000- 100,000	4,450	1,400	5,375	6 0	7,638	8 5
100,000- 250,000	1,150	325	2,266	2 5	1,759	1 9
250,000- 500,000	150	60	555	0 6	212	0 2
500,000-1,000,000	80	18	152	0 2	100	0 1
1,000,000 and over	20	9	52	0 1	29	2
Total	79,050	38,362	90,300	100 0	90,300	100 0

¹ For frequency distributions of separate returns of husbands, separate returns of wives, and community property returns, before the adjustments for net capital gains, deductions from gross income, and interest from tax-exempt obligations, see Table 4

² Less than 0.05 per cent.

duction in the proportions of aggregate family income at both extremes of the \$7,500 to \$1,000,000 and over income range, but more particularly at the highest income class.

5 ADJUSTING FOR CAPITAL GAINS, VARIOUS TYPES OF DEDUCTION, AND TAX-EXEMPT INTEREST

As indicated above, the adjustments made to bring the statutory net income classification more closely in line with the definition of net income used in the Consumer Purchases Study were carried through independently for three groups of returns¹⁴ before the final combination of the returns made by family members into a single distribution by family units. To accomplish this adjustment, it was proposed to subtract net capital gains from statutory net income, and to add deductions for net capital losses, interest and taxes paid, contributions and 'other deductions', as well as the amount of income received from wholly or partly tax-exempt securities. It was not necessary to add to the statutory net income the other two types of deduction allowed on the income tax returns—business loss and partnership loss—since these items had also been deducted from gross income in deriving net income as reported in the Consumer Purchases data.

For reasons discussed below, it was decided to adjust statutory net income for the exclusion of capital gains and the inclusion of the five types of deduction and tax-exempt interest in a single step, rather than to correct separately for each item. Net capital loss reported by all returns with statutory net incomes of \$5,000 or more amounted to \$69 million in 1935, interest paid to \$241 million, taxes paid (allowable as deductions) to \$268 million, contributions to \$148 million, and 'other deductions' to \$320 million. The five items of deduction summed to \$1,046 million. Tax-exempt interest from wholly or partly tax-exempt securities, not included in gross or in statutory net income, was estimated at \$250 million for the \$5,000 and over income range.¹⁵ Net

¹⁴ Joint returns combined with returns of heads of families, separate returns of husbands combined with community property returns of husbands, and separate returns of wives combined with community property returns of wives.

¹⁵ As indicated in Sec. IV, the data on tax-exempt interest are known to be incomplete.

capital gain for this income range was reported as \$400 million. The net increase in aggregate income for all types of returns represented by these several items was therefore \$896 million.

a) *Division of income and deduction items among groups of returns*

As a first step in the adjustment, it was necessary to distribute this total amount among six groups of returns:

1. Joint returns of husbands, wives, and dependent children, plus the returns of either husband or wife when no other return is filed, and the returns of heads of families who are single men, married men not living with wives, single women, or married women not living with husbands
2. Separate returns of husbands, including community property returns
3. Separate returns of wives, including community property returns
4. Returns of single men and of married men not living with wives, not heads of families
5. Returns of single women and of married women not living with husbands, not heads of families
6. Returns of estates and trusts

The division among these groups was made on the basis of the percentage distribution of statutory net income among the six groups at each of the 34 income levels above \$5,000. Of the total of \$896 million, \$160 million was thereby assigned to the returns of persons not heads of families and the returns of estates and trusts. The remainder, \$736 million, was assigned to the first three groups of returns comprising members of family units. The bulk of this amount, \$428 million, was to be added to the net income of the first group of family units with statutory net incomes of \$5,000 or more, \$225 million to the separate returns of husbands in group 2, and \$83 million to the separate returns of wives in group 3.

b) *Addition of average amounts to statutory net income*

The procedure used in adding these amounts to the statutory net income classes in each of the three distributions involved two

main steps: (1) the actual addition of the assigned amount to the aggregate income at each income level; (2) the shifting of a certain proportion of the returns, together with their statutory net income and their assigned amount of additional income, from one income class to the next higher class. Such shifting was necessary because the addition of deductions and tax-exempt interest to those returns that were already near the upper limit of a given statutory net income class brought their incomes within the range of the next higher class—the new income class being on an ‘adjusted’ rather than a ‘statutory’ net income basis. For example, if an average amount of \$2,284 in deductions and tax-exempt interest is added to the returns in net income class \$15,000–\$20,000, those returns which had statutory net incomes of \$17,716 or more would shift upward into the class interval of \$20,000 to \$25,000.

The number of returns shifting from one income class to the next higher class was determined on the basis of a cumulative frequency curve drawn freehand for each of the three groups of returns representing members of family units. The number of returns between the upper limit of the income class and the point of shift was read from the curve, the latter point being the difference between the upper limit of the class and the average amount of deductions and tax-exempt interest assigned to the level. This average was derived by dividing the aggregate deductions and tax-exempt interest (minus the capital gains) in the income class by the total number of returns in the class. In order to simplify the procedure, the 34 income classes that had been used up to this point were combined into 14 broader income levels—the 12 levels above \$7,500 in Table 1, and two additional levels, \$5,000–\$6,000, and \$6,000–\$7,500.

The aggregate deductions and tax-exempt interest assigned to each income class was distributed between the group of returns remaining in the class and the group shifting to the next higher class on the basis of the relative magnitudes of the two groups. The returns shifting upward were assumed to have been evenly distributed between the point of shift and the upper limit of the income class. The aggregate net income of this group was calculated, therefore, by multiplying the number of such returns by the midpoint between the point of shift and the upper

limit of the class.¹⁶ Thus, the adjusted aggregate income in each income class was derived by adding to the aggregate statutory net income in the class the additional aggregate income from deductions and tax-exempt interest accruing to those returns remaining in the class, plus the aggregate net income and the income from deductions and tax-exempt interest of those returns shifting into the class, and subtracting the aggregate net income¹⁷ of those shifting out of the class.

As a result of this procedure the aggregate income of returns with incomes of \$5,000 and over in the three distributions comprising members of family units was increased \$1,026 million, an amount \$290 million greater than the estimated amount of deductions and tax-exempt interest added to the returns with incomes of \$5,000 or more. This difference of \$290 million represented the net income and the deductions and tax-exempt interest of returns shifting upward from the income class directly below \$5,000.¹⁸

¹⁶ In the example given above, the midpoint between \$17,716 and \$20,000. The resulting amount of aggregate income was subtracted from income class \$15,000-\$20,000 and added to income class \$20,000-\$25,000. Income from deductions and tax-exempt interest was calculated by multiplying the number of returns shifting by the average amount of deductions and tax-exempt interest that was added to their returns.

¹⁷ Thus, in the example given above, the amount of aggregate net income added at income class \$20,000-\$25,000 was subtracted from income class \$15,000-\$20,000.

¹⁸ Although the adjustments of the income tax data were made primarily for the income range above \$5,000, it was necessary, in this and in subsequent adjustment steps, to estimate the correction factor for returns in the income intervals directly below \$5,000 as well. The number of adjustments involving the shifting of returns to higher income classes made it essential to extend the income range studied to a point lower than \$5,000 in order to avoid incomplete data in the final distribution above \$7,500. The adjustments for deductions and tax-exempt interest in the income classes below \$5,000 were inevitably very arbitrary, since the available tabulations of the income tax statistics included no data on sources of income and deductions for these classes. Hence it was necessary to assign estimated amounts of deductions and tax-exempt income to them. Otherwise the procedures used in adjusting this lower range were similar to those used for the levels above \$5,000.

Returns reporting net deficits were not included in this analysis. Of the 94,609 returns with net deficits in 1935, it is estimated that less than 2,000 would fall in the positive income range immediately above \$5,000 if the figures are adjusted to conform to the definition of net income used in the Study of Consumer Purchases.

c) *Assumptions underlying procedures*

Implicit in the method adopted to determine the point of shift used in deriving the adjusted income distribution was the assumption that each individual return within an income class reported average deductions and tax-exempt interest equal to the average amount prevailing for the class.

It is obvious that this assumption is in conflict with the facts as shown by tabulations presented in *Statistics of Income for 1935*. These tabulations indicate that only a portion of the returns in any given income class show entries for each of the individual items of income and deduction, and that, in the case of capital gains and losses at least, those returns that do report such items show widely varying amounts within the same income class.¹⁹

These data appear, at first, to suggest that a better adjustment might have been effected if the corrections for each item of deduction, for capital gains, and for tax-exempt interest had been carried through separately. The average amount of each item per return reporting the item could then have been estimated and used to determine the number of returns and the aggregate income shifting upward to the next higher income class, and, in the case of capital gains and losses, variable amounts of each item (as reported in *Statistics of Income*) could have been added to or deducted from the returns within an interval. Such a procedure, however, would have involved numerous difficulties, without any compensating assurance that the adjusted distribution would more nearly resemble the actual distribution of family units according to the 'adjusted' net income basis desired.

First, since the tabulations in *Statistics of Income* present the frequencies of returns reporting each type of income and deduction only for all groups of returns combined, it would have been necessary to estimate the distribution of the frequencies at each income level among the several types of returns, i.e., joint returns, separate returns of husbands, returns of single men not heads of families, etc.

¹⁹ See *Statistics of Income for 1935*, pp. 18-20. Tables showing the frequency of specific amounts of deduction items reported at each net income class are available only for capital loss and business loss.

Second, the procedure would have required arbitrary judgments as to the allocation of each type of deduction and of capital gains and tax-exempt interest among the returns within each income class, inasmuch as the available tabulations do not indicate the extent of overlapping in the groups of returns showing the several items. There is no way to determine, for example, the extent to which the group of returns showing capital gains includes, or excludes, the group of returns in the same income class showing tax-exempt interest. Attempts to assign specific types of deductions, capital gains and tax-exempt income to different groups of returns within a given income class, in either equal or varying amounts, would have entailed a series of arbitrary judgments which might well have introduced even more error than the addition of the same average amount of the combined items to each return within an income class.

Third, the statistical procedure would have been extremely complicated by undertaking separate adjustments for the various income and deduction items, since it would have been necessary to keep track of the returns shifted upward from each statutory net income class as a result of each adjustment step. Those returns shifted upward from a given net income class as a result of adding deductions for interest paid, for example, would have to be considered together with the returns remaining in the income class in determining the shifts that would occur when a second adjustment, e.g., for addition of taxes paid, was made. The procedure would be further complicated by the fact that in the adjustment to subtract capital gains the returns would have shifted downward rather than upward.

In the light of these considerations, it was decided that a less complicated and less time-consuming procedure, involving a single adjustment for the several items, would be more satisfactory. It seemed better to combine all the deductions, capital gains, and tax-exempt income at a given income level, and to assign the same average amount to every return at that income level, rather than to venture into the maze of arbitrary decisions involved in any alternative procedure.

The procedure used probably tended to underestimate the net amount of additional income belonging to the returns in the upper portion of each net income class, and to overestimate the

amounts belonging to returns in the lower portion. Since the average amount of deductions, capital gains, and tax-exempt interest increases as we move up the income scale, and since the proportions of returns in each income class showing each type of deduction and capital gain also rise steadily as income increases, similar tendencies no doubt prevail within an income class.

But even if we accept this description of the bias introduced at particular income levels, it is extremely difficult to appraise the ultimate direction and magnitude of the bias introduced in the adjusted distributions of family units and aggregate family income. If the returns in the upper portion of each income interval had been arbitrarily assigned higher average amounts of deductions, capital gains, and tax-exempt income than those in the lower portion, the *average income* (net income plus additional amounts for deductions, etc.) of those returns shifting to the next higher bracket would, of course, have been raised. On the other hand, this procedure might very possibly have reduced the *number* of returns shifting, and hence have reduced both the *aggregate net income* and the *aggregate additional income* from deductions, etc., shifted to the higher level. The results are virtually indeterminate, until the exact basis of allocation of the income and deduction items is decided, and the calculations actually carried through.

It is to be regretted that the special tabulations of the 1936 income tax returns, as now planned, will not afford any satisfactory basis for judging the nature or the extent of the error introduced into the National Resources Committee estimates by the methods used in adjusting the net income classification to allow for these items of deduction, capital gains, and tax-exempt interest. The tabulations will show, for each income level and each type of return, the number of returns reporting each source of income and each deduction item, together with a frequency distribution of returns showing specified amounts of each item. Since the income classes used for these tabulations will be based on statutory net income excluding capital gains and losses, the problem of adjusting for these two items will be eliminated. But the problem of adding tax-exempt interest and the deduction items of interest paid, contributions, taxes paid, and 'other deductions' will remain. Tabulations of the three groups of returns

listed at the beginning of this section according to 'adjusted' net income classes—statutory net income minus capital gains, plus capital losses, interest paid, contributions, taxes paid, and 'other deductions'—would afford perhaps the only factual basis for appraising the results of the National Resources Committee procedures in adjusting the income tax data to allow for these items.

6 ADJUSTING TO 1935-36 BASIS

The distribution of family units obtained in the preceding steps was based entirely on income tax data for the calendar year 1935. This distribution was now adjusted to reflect the effects of the substantially larger national income received by American consumers during the fiscal year 1935-36. As the figures in Tables 3 and 4 indicate, this particular adjustment had a very significant effect on both the number of family units and the aggregate net income in the upper income ranges. Unfortunately, the available data and the methods used in making the adjustment were not geared to the importance of the task in hand.

Comparison of the income tax tabulations for 1935 and the preliminary data for the calendar year 1936 afforded some measure of the differences in the number of returns showing net incomes of \$5,000 and over and in the aggregate income reported in the two years,²⁰ but they offered no clue as to how much of this change should be attributed to the continued expansion of the national income during the last half of 1936. The only available data bearing on this general question were the monthly estimates of national income paid out, prepared by the National Income Section of the Department of Commerce.²¹ These estimates indicate a total national income of \$62,441 million paid out during the calendar year 1936, representing a 13.6 per cent rise over the estimated amount for 1935. An estimate for 1935-36, based on monthly estimates for the last half of 1935 and the first half of

²⁰ These preliminary data differed only very slightly from the figures for 1936 subsequently published in *Statistics of Income*. The aggregate net income for returns with incomes of \$5,000 and over, for example, was estimated at \$8,713 million in the preliminary tabulations, while the final figure for this income range was \$8,895 million.

²¹ See R. R. Nathan and F. M. Cone, 'Monthly Income Payments in the United States, 1929-37', *Survey of Current Business*, February 1938.

1936, showed a 5.5 per cent rise over the 1935 figure, or 40.3 per cent of the total rise from 1935 to 1936.

The adjustment of the 1935 family distribution to a 1935-36 basis was made by relating these changes in the size of the national income paid out over this two-year period to the differences in the total number of returns and in the aggregate income reported for 1935 and 1936 on those individual income tax returns showing net incomes of \$5,000 and over.

The lack of detailed breakdowns in the preliminary tabulations for 1936 made it impossible to carry through the same combinations and adjustments that had been made of the 1935 data and thus establish a direct relationship between the income distributions in 1935 and in 1936. Instead, the comparison was based on the difference in the aggregate income (statutory net income minus capital gains and plus deductions for capital loss, interest paid, taxes paid, contributions, and 'other deductions') reported by all types of returns with statutory net incomes of \$5,000 and over in 1935 and 1936. This comparison indicated a total increase of 36.5 per cent from 1935 to 1936.

The assumption was now made that the increase in aggregate income (as defined above) between 1935 and 1935-36 would bear the same relationship to this total increase of 36.5 per cent that the increase from 1935 to 1935-36 in national income paid out bore to the total increase from 1935 to 1936. Accordingly, 40.3 per cent of the \$2,458 million increase in aggregate income between 1935 and 1936 shown by all types of returns with net incomes of \$5,000 and over was taken to represent the increase in aggregate income from 1935 to 1935-36.

Only part of this increase in national income, of course, accrued to income recipients belonging to family units. It was therefore necessary to divide it among the various groups of returns on some proportionate basis. The percentage distribution of aggregate income (as defined above) among the various types of returns in 1935 was used as the basis for this division. Since the available income tax data for 1936 were not classified by type of return, it was necessary either to accept the 1935 percentage relationship as between the group of returns of members of families (groups 1-5 and 8 as listed in Sec. III, 3) and the group of returns of non-members (groups 6, 7, and 9) as representative of

1935-36 also, or to attempt a purely arbitrary correction of the data. Subsequent comparison of the 1936 relationships with those for 1935 indicate sufficient similarity to justify the acceptance of the 1935 data as a basis for the division.²²

That portion of the increased income attributable to returns filed by family members, \$815 million, was now distributed by income level according to the percentage distribution of aggregate income shown by the family distribution for incomes of \$5,000 and over derived from the 1935 income tax data. Again it seemed better, in the absence of a detailed income classification for the 1936 data, to accept the 1935 relationships than to attempt an entirely arbitrary adjustment. Subsequent comparisons of the 1935 and 1936 income tax data for all types of returns combined reveal a very marked similarity in the two percentage distributions.²³ The method may have overstated to some slight extent the proportions of the increased national income received by the income classes between \$5,000 and \$15,000, and to have understated slightly the proportion received by the income range between \$15,000 and \$1,000,000.

The additional amounts of aggregate income assigned to the various income levels by the procedure described above were then added to the aggregate amounts shown in the 1935 family distribution to obtain a distribution of aggregate family income for 1935-36.

The number of family units at each income level in the 1935-36 distribution was determined by dividing the 1935-36 aggregate income at each income interval by the average (mean) income within that interval, as shown by the family distribution derived from the 1935 data. This procedure was based on the assumption that there would be no significant change from one year to another in the distribution of family units within any given income interval. The validity of this assumption might be

²² Of the aggregate net income reported in *Statistics of Income* for returns with net incomes of \$5,000 and over, 82.35 per cent in 1935 and 82.19 per cent in 1936 represented the income of members of family units.

²³ Of the aggregate net income reported in *Statistics of Income* for returns with incomes of \$5,000 and over, 37 per cent fell in the range \$5,000-\$10,000, 15 per cent, \$10,000-\$15,000, 9 per cent, \$15,000-\$20,000, 21 per cent, \$20,000-\$50,000, 9 per cent, \$50,000-\$100,000, and 9 per cent, \$100,000 and over in 1935. The corresponding percentages in 1936 were 34, 14, 9, 22, 10, and 11.

questioned in the case of the very broad income intervals at the top of the income range, but comparisons made on the basis of statutory net income figures shown in the 1935 and 1936 *Statistics of Income* reveal a very great similarity in the average net income figures in identical income classes.

7 ADJUSTING FOR NONREPORTING AND UNDERSTATEMENT OF INCOMES

The necessity for adjusting the federal income tax data to allow for the understatement and the nonreporting of incomes has been generally recognized by economists seeking to use these data in arriving at a national distribution of income by size.²⁴ In every case, such adjustments have been predicated on essentially arbitrary assumptions concerning the probable prevalence and amount of understatement and nonreporting at different income levels. Since the particular assumptions adopted necessarily reflect subjective judgment rather than factual evidence, they are particularly subject to criticism.

The adjustments made by the National Resources Committee for understatement and nonreporting are no exception to this general rule. In approaching this problem the effort was made to obtain tentative estimates from tax students and others who were in a position to offer authoritative opinions based on an intimate knowledge of the problems involved. The results were far from satisfactory. Treasury officials, who were perhaps in the best position to have an informed judgment in the matter, were unable to furnish definite estimates. Estimates ventured by various persons ranged widely about those finally accepted.

However, the interviews did reveal a general agreement on certain aspects of the problem: (1) that the preponderance of understatement and nonreporting occurs in connection with income from fees, rents, profits, royalties and 'other income'; (2) that nonreporting is apt to occur more frequently at the low than at the high income levels, and tends to be negligible at income levels

²⁴ See, e g., estimates for 1929 by Leven in Maurice Leven, H. G. Moulton, and Clark Warburton, *America's Capacity to Consume* (Brookings Institution, 1934), p. 167 and footnotes to Table 23; and estimates for 1918 by Macaulay in W. C. Mitchell, W. I. King, F. R. Macaulay, and O. W. Knauth, *Income in the United States* (National Bureau of Economic Research), I (1921), 109, 124, 130; and II (1922), 253-68.

above \$20,000, (3) that understatement also tends to be relatively more frequent at the lower income levels but extends further up the income scale. The exact percentages applied by the National Resources Committee to correct for understatement and nonreporting reflect these composite opinions. The adjustments were made in two consecutive steps.

a) *Adjustment for nonreporting*

The correction for nonreporting was intended to account for the incomes of those families that are legally required to file income tax returns and fail to do so, as well as for the incomes received by state and local officials, whose salaries are not subject to federal income taxation.²⁵ The adjustment, which affected both the number of families and aggregate net income, was based on arbitrary estimates of the probable percentage increase in income tax returns if all families with incomes of \$5,000 and over had filed returns on their incomes for the year 1935-36.

The assumption that most nonreporting is concentrated in the

²⁵ The number of state and local officers and employees whose salaries were exempt from the federal income tax in 1937 was estimated at 2608,289, but only 16,206 of these persons had salaries above \$5,000, see *Hearings before Committee on Ways and Means, House of Representatives, 76th Cong., 1st Sess., Jan. 26, 1939. Tax-Exempt Salaries, Table 1, p. 26.* The estimated number of state and local officers and employees in 1937, by salary classes, as presented in these *Hearings* by J. W. Hanes, Undersecretary of Treasury, is given below. The distribution would, of course, be higher if the tabulation were made on the basis of income classes, including income other than salaries, rather than on the basis of salary classes.

SALARY CLASSES	NUMBER	PERCENTAGE DISTRIBUTION
\$1,000 and under	1,036,108	39.72
1,001- 1,500	544,770	20.89
1,501- 2,000	439,140	16.84
2,001- 2,500	323,797	12.41
2,501- 3,000	135,731	5.20
3,001- 3,500	53,395	2.05
3,501- 4,000	33,261	1.28
4,001- 4,500	18,527	.71
4,501- 5,000	7,354	.28
5,001- 6,000	7,231	.28
6,001- 7,000	3,313	.13
7,001- 8,000	2,174	.08
8,001- 9,000	1,242	.05
9,001-10,000	907	.03
Over \$10,000	1,339	.05
Total	2,608,289	100.00

lower ranges and is negligible above \$20,000 recognizes two considerations: (1) that the exempted salaries of state and local officials do not, for the most part, exceed \$10,000; (2) that evasion of the income tax law through nonreporting tends to become increasingly difficult as incomes become larger. The specific set of percentages used for increasing the number of families and aggregate net income in the income classes between \$5,000 and \$20,000 are, of course, wholly arbitrary. The number of returns and aggregate income between \$5,000 and \$10,000 were increased 25 per cent, those between \$10,000 and \$15,000, 15 per cent; and those between \$15,000 and \$20,000, 5 per cent.

b) *Adjustment for understatement*

Like nonreporting, understatement of income was assumed to vary by income level and to be proportionately greater at the lower levels. This assumption recognized that returns showing higher incomes are probably based on more adequate accounts and are subject to a more careful audit by Treasury officials—both factors which would tend to discourage illegal understatement for the purpose of evading income tax payments. Specifically, it was decided that the aggregate income of families with incomes between \$5,000 and \$20,000 should be increased 15 per cent, that of families between \$20,000 and \$25,000, 10 per cent, and that of families between \$25,000 and \$50,000, 5 per cent.²⁶

Although these percentages were applied to total income at the various levels, they were designed to reflect primarily the understatement of income from the four sources mentioned above: (1) business profits; (2) partnership profits; (3) rents and royalties;

²⁶ A direct comparison of these percentages and of those for nonreporting with the percentages used by Leven in the Brookings estimates for 1929 and by Macaulay in the National Bureau estimates for 1918 is not possible. Leven does not make separate adjustments for nonreporting and understatement. He indicates that a correction for underreporting and evasion was made by increasing the estimated number of income tax returns for business and professional incomes 65 per cent. As Merwin points out (Part One, Sec. II, 3, c) it is not clear whether the same percentage was used in correcting each income class above \$5,000.

Macaulay's adjustments of the 1918 data included both an adjustment for farmers and small business men who filed no returns and an adjustment to allow for evasion by persons actually reporting. The exact percentages used in adjusting the data at different income levels are not shown, but the aggregate income reported on returns between \$5,000 and \$50,000 was increased \$2 billion to allow for understatement of incomes at these levels. *Op. cit.*, II, 259

(4) 'other income' (including income from all sources not specifically reported). The proportion of aggregate statutory net income on all types of returns in 1935 attributable to these four sources is shown by the tabulations in *Statistics of Income* to have declined as incomes increased above \$5,000. Thus the proportion at the statutory net income class \$5,000-\$7,500 was 29 per cent, while that at class \$40,000-\$50,000 was 21 per cent. The additional amounts of income added at the several income classes to adjust for understatement represented increases of 59 per cent in the income from these four sources for the income class \$5,000-\$7,500 and 26 per cent for the income class \$40,000-\$50,000. The total amount added for understatement in the income ranges \$5,000 to \$50,000 was equal to approximately 50 per cent of the aggregate amount reported from these four sources of income by all returns showing net incomes of \$5,000 and over.²⁷ These estimates of understatement do not take into account any legal evasions of income tax liability which may result in understatement at levels above \$50,000. It is quite possible that this type of evasion increases rather than decreases as income rises, and the failure of the National Resources Committee estimates to make specific allowance for such understatement may tend toward an underestimate of the number of families and aggregate income in the very high income ranges.

The actual procedure of correcting for understatement differed from that used for nonreporting in that the number of returns was not increased, except as a result of returns shifting from the income class directly below \$5,000. The total amount of income to be added at each income level to correct for understatement was calculated by applying the appropriate percentages to the aggregate income figures shown by the 1935-36 family distri-

²⁷ Since the correction for understatement discussed here applied only to the returns of members of family units, the percentages of understatement should preferably be related to the income reported from the four sources by those types of returns representing family members. However, data for sources of income are available only for all types of returns combined, including the returns of single individuals and of estates and trusts. The correction for understatement of family income from these four sources is therefore somewhat greater than 50 per cent. This figure of 50 per cent is inaccurate also because statutory net income classes are used here for the four sources of income, while the aggregate amount of understatement refers to income classes after the several adjustments described above had been made.

bution after the correction for nonreporting had been completed.

Following the procedure adopted in the case of the adjustment for deductions and tax-exempt interest, all the returns in each income class were assumed to have understated their incomes by the average amount prevailing for the entire class. The average understatement at each level was therefore determined by dividing the aggregate amount by the number of family units in the class. Addition of this average amount resulted in a shifting of some families from each income level to the next higher level. This shift and the corresponding shift in aggregate income were accomplished by the methods described above for adding deductions and tax-exempt interest to the net income distributions.

8 ADDING INCOME OF SUPPLEMENTARY EARNERS

As indicated earlier, the income tax statistics provided no information on the incomes received by non-dependent members of economic families other than wives. Yet to achieve comparability with the Consumer Purchases data, it was necessary to make some allowance in the family income distribution for the amounts contributed by such supplementary income recipients. Unfortunately, while the Consumer Purchases data included in the family income figures total income from all sources, entries for the individual family members pertained only to earnings. Hence the schedule data offered no adequate basis for estimating total income contributed by non-dependent income recipients. Because of this deficiency in the available data on supplementary income, and because the method otherwise tended, as explained below, to overestimate the average number of supplementary earners at the various income levels, no specific adjustment was made to allow for supplementary incomes other than earnings. The omission of supplementary income from rents, investments, royalties, pensions, etc., may result in a slight understatement of the aggregate income of family units.

Available tabulations from the Study of Consumer Purchases showed for individual sample communities the number of supplementary earners at each income level. These supplementary earners were classified into four types—husbands, wives, others 16 years and over, and others under 16 years. The average earnings for each type were also shown, by income level. Inasmuch as

the earnings of husbands, wives, and dependent children under 18 are required by law to be included as part of the family income—in a joint return, in the separate returns of husband and wife, or in a single return by the head of the family—the income tax data were presumably deficient only by the amount of the income received by the 18 year and over part of the supplementary earners of the third type, those persons 16 years and over other than husbands or wives.

Available tabulations of the Consumer Purchases data did not make it possible to segregate supplementary earners between the ages of 16 and 18 years, so that it was necessary to make the adjustment on the basis of the data for the entire group of supplementary earners (other than husbands and wives) over 16. The upward bias introduced by this procedure was, as observed earlier in the discussion, at least partly compensated for by the lack of any adjustment for supplementary income recipients who were not earners, or for income received by supplementary earners from other sources.

The adjustments for supplementary incomes were made on the basis of preliminary tabulations for eight large cities²⁸ included in the Study of Consumer Purchases. It would have been more desirable, of course, to have utilized data from all types of community, properly weighted to obtain national averages. This was not possible, and an examination of sample data for other communities indicated that the eight cities were not unrepresentative. From these sample data were calculated the average number of supplementary earners of 16 years and over for families in each income class up to \$10,000, and the average earnings per supplementary earner in each class. By multiplying the average number of supplementary earners per family by the average earnings per supplementary earner, there was obtained for each income class up to \$10,000 an average amount of supplementary earnings per family to be added to the incomes of the families in the 1935-36 family distribution.

The average amounts to be added at successive income classes above \$10,000 were estimated by plotting the data for the classes below \$10,000 and extending the curve freehand to read off the

²⁸ Data from Atlanta, Ga., Chicago, Ill., Columbus, O., Denver, Colo., New York, N. Y., Omaha, Nebr.-Council Bluffs, Iowa, Portland, Ore., Providence, R. I.

extrapolated values. The extrapolated values naturally showed a declining number of supplementary earners per family as incomes advance beyond \$10,000. The average number of supplementary earners per family ranged from .38 at the income level \$5,000-\$7,500 to .17 at the level \$10,000 and over. The average amount of supplementary earnings per earner ranged from approximately \$1,000 to approximately \$1,500. Whereas this seems plausible enough, in terms of earnings, the discrepancy between supplementary earnings and supplementary income probably becomes greater at the higher income levels, so that the correction tends toward a greater understatement of supplementary income at the top of the income range.

Once having determined, by the above means, the average amount of supplementary earnings to be added at each income level, it was possible to carry forward the adjustment by using the methods used in adding average deductions and tax-exempt interest and in adding the estimated average amounts necessary to correct for understatement of income.

Obviously, the data and procedures followed in adjusting for supplementary incomes had numerous shortcomings, but the adjustment as a whole had merely a minor effect on the national distribution.

9 ADDING IMPUTED VALUE OF NON-MONEY INCOME

A more substantial adjustment of the income tax distribution was necessary to allow for the imputed value of those types of non-money income covered by the estimated income distribution based on Consumer Purchases data. The value of home-produced food is probably a negligible item of income for most families reporting net incomes of more than \$7,500 but the value of occupancy of an owned dwelling or dwellings is apt to be of considerable importance even in the upper income ranges, where the proportion of families owning their own dwellings is very high.

Consumption data collected in the Study of Consumer Purchases yielded data on the average value of non-money items of income at each income level up to \$20,000 and over. These average amounts were added at each income level by the procedure used in preceding adjustments, with the distribution of families and of aggregate income shifting upward to allow for those fam-

ilies whose incomes were sufficiently increased by the added income to cause them to move into a higher income class. For the several income classes within the \$20,000 and over range, it was necessary to resort to extrapolated figures read from a free-hand extension of a curve plotted from the data for lower income levels.

VI Correction of Preliminary Income Distribution based on Consumer Purchases Data

The addition of the imputed value of non-money items of income completed the series of adjustments of the income tax data, and yielded a distribution of family units and of aggregate income for income levels above \$7,500 which was, within the limitations of the data and of the procedures adopted, on a comparable basis with the estimated national distribution built up from the sample income data collected in the Study of Consumer Purchases. The latter distribution, known to be deficient in the high income levels, was now corrected by adding at each income interval above \$7,500 the additional number of families and amount of aggregate income that the adjusted income tax data indicated belonged in those income intervals. This correction, in effect, substituted above \$7,500 the distribution based on corrected income tax data for the distribution based on sample data.

Since the population weights used in building up the estimated national distribution had included all families in the United States as of January 1, 1936, it was necessary to reduce the number of families in the income intervals below \$7,500 to allow for the increased number of families in the higher income intervals. On the assumption that the sample data below \$7,500 reflected accurately the relative proportions of families at the different income levels, i.e., that the tendency toward underrepresentation at the high income levels did not begin until the \$7,500 level, the total reduction in the number of families below \$7,500 was distributed among the various income intervals in proportion to the relative number of families in each interval before the correction was made.

These proportions were obtained by calculating a percentage distribution, by income level, of the total number of families be-

low the \$7,500 level. The resulting percentages were applied to the total number of families to be subtracted from the distribution below \$7,500 (that is, the number added above \$7,500) to obtain the number of families to be subtracted from the various income intervals. The aggregate income at each interval below \$7,500 was, of course, decreased in proportion to the decrease in the number of units at that interval.

As Table 2 indicates, the substitution of the adjusted income tax distribution for the Consumer Purchases distribution for income levels above \$7,500 raised the proportion of families with in-

TABLE 2

COMPARISON OF ESTIMATED NUMBER OF FAMILIES HAVING INCOMES BETWEEN \$7,500 AND \$10,000, AND INCOMES ABOVE \$10,000, BASED ON CONSUMER PURCHASES DATA AND ON FEDERAL INCOME TAX DATA, 1935-1936

INCOME CLASS	DISTRIBUTION OF FAMILIES BASED ON			
	CONSUMER PURCHASES DATA	FEDERAL INCOME TAX DATA		
	NUMBER	PERCENTAGE OF ALL FAMILIES ¹	NUMBER	PERCENTAGE OF ALL FAMILIES ¹
\$7,500-\$10,000	71,394	0.24	187,060	0.64
10,000 and over	66,562	.23	283,791	.97
Total	137,956	.47	470,851	1.61

¹ The total number of families was estimated in *Consumer Incomes in the United States* to have been 29,400,300; see that report, Tables 1 and 3.

comes of \$7,500 and over from 0.47 to 1.61 per cent. It is unfortunate that a similar comparison in terms of aggregate income is impossible, since an estimate based on Consumer Purchases data of aggregate family income for the \$7,500 and over range was not prepared; the percentage increase in aggregate family income as a result of the substitution would, of course, have been greater than the percentage increase shown in Table 2 for the number of families.

The use of \$7,500 as the lower limit of the income range for which the adjusted income tax distribution was substituted for the Consumer Purchases distribution is perhaps open to some question, because of the possibility that underrepresentation of high incomes in the Consumer Purchases data may have extended somewhat below the \$7,500 level. Unfortunately, the income range common to the two family distributions was fairly narrow. In view of the marked deficiencies of the adjusted income tax dis-

tribution below the \$7,500 level, there seemed little to be gained by adopting any compromise method of splicing the two distributions, such as was used in the case of the distributions for single individuals.²⁹

VII Summary of Results of Various Adjustments

The results of the various adjustments in the income tax data are summarized in Tables 3-5. Table 3 summarizes the changes in the aggregate income of members of family units with incomes of \$7,500 and over, Tables 4 and 5 compare the distributions, by income level, resulting from the series of adjustments of the data. These tables present the figures only for the income range above \$7,500. Although the series of adjustments extended to lower income classes, the comparisons have been confined to the income range for which an adequate distribution was available after the final adjustment had been made. Data for the income classes immediately below \$7,500 were incomplete because of the shifting of frequencies and of aggregate income from one income level to the next higher level as the series of adjustments was carried through.

1 CHANGES IN AGGREGATE INCOME

Table 3 shows the aggregate income of the \$7,500 and over income range before and after each type of adjustment, and the increase in income resulting from each step. The aggregate income of members of family units reporting statutory net incomes of \$7,500 and over was reported in *Statistics of Income* as \$3,712 million. As a result of the series of adjustments, the aggregate income of families with 'adjusted' net incomes of \$7,500 and over was \$8,030 million, an increase of approximately 116 per cent.

²⁹ The distributions for single individuals were spliced at the \$3,000 income line, and the curves for single men and women with incomes between \$3,000 and \$5,000, based on sample data, were smoothed to conform more closely with the curve shown by the adjusted income tax data, see *Consumer Incomes in the United States*, pp 69 87

TABLE 3

SUMMARY OF CHANGES IN AGGREGATE INCOME OF MEMBERS OF FAMILY UNITS WITH INCOMES OF \$7,500 AND OVER, RESULTING FROM SUCCESSIVE ADJUSTMENTS OF DATA FROM FEDERAL INDIVIDUAL INCOME TAX RETURNS FOR 1935

TYPE OF ADJUSTMENT	AGGREGATE INCOME BEFORE ADJUSTMENT	INCREASE DUE TO ADJUSTMENT ¹ (millions of dollars)	AGGREGATE INCOME AFTER ADJUSTMENT
Individual returns as reported in <i>Statistics of Income</i> ²			
Joint returns and returns of male and female heads of families	1,911		
Separate returns of			
Husbands	1,125		
Wives	392		
Community property returns	284		
Total	3,712		
Adjustment for net capital gains, deductions from gross income, and interest from tax-exempt securities			
Joint returns and returns of male and female heads of families	1,911	632	2,543
Separate returns (incl. com- munity property returns) of:			
Husbands	1,330	263	1,593
Wives	471	103	574
Total	3,712	998	4,710
Pairing separate returns of husbands and of wives (incl. community property returns)	2,167	338	2,505
Adjustment from 1935 to 1935-36 basis (joint returns, returns of heads of families, paired returns of husbands and wives, and community property returns)	5,048	659	5,707
Adjustment for.			
Nonreporting	5,707	423	6,130
Understatement	6,130	1,154	7,284
Income from supplemen- tary earners	7,284	312	7,596
Imputed value of non- money items of income	7,596	434	8,030

¹ The amounts listed in this column can, in most cases, be divided into the part due to the adjustment 'proper', and the part due to the shifting of returns or of family units from income classes below \$7,500 as a result of the adjustment. The latter amounts were estimated at \$359 million in the adjustment for deductions added to

The \$4,318 million added by the adjustments of the data was distributed as follows: \$998 million, or 23 per cent of the total amount, resulted from the adjustment made to subtract net capital gains, and to add the various types of deductions allowed on the income tax returns and the tax-exempt interest from wholly or partly tax-exempt securities; \$338 million, or 8 per cent, from the pairing of the separate returns of husbands and wives to form family units; \$659 million, or 15 per cent, from the adjustment of the 1935 data to a 1935-36 basis; \$423 million, or 10 per cent, from the adjustment for nonreporting of incomes; \$1,154 million, or 27 per cent, from the adjustment for understatement of incomes; \$312 million, or 7 per cent, from the addition of income of supplementary earners; and \$434 million, or 10 per cent, from the addition of the imputed value of non-money items of income.

In almost all the adjustments, the amount by which the aggregate income above \$7,500 was raised includes more than the amount attributable to the particular income items that were being added to the distribution, that is, the increase in aggregate income due to the adjustment for capital gains, deductions, etc., was more than the total amount of deductions and tax-exempt income added to the group having statutory net incomes above \$7,500. Similarly, the increase due to the adjustment for understatement of incomes was more than the estimated aggregate understatement for this income range. A relatively large part of the increase in aggregate income resulting from each adjustment step represents the income of those returns which are shifted upward from below the \$7,500 level as a result of the adjustment. The exact amounts added because of these shifts are indicated in footnote 1 to Table 3. In instances where the assumed average amount of correction, e.g., the average amount of deductions or

(footnotes to Table 3 concluded)

joint returns, at \$58 million for deductions added to separate returns of husbands, and at \$32 million for deductions added to separate returns of wives. All the \$338 million added by the combination into husband-wife units represented the aggregate income of returns of husbands and of wives whose combined income brought them up into the range above \$7,500. The increases due to the adjustments for understatement of incomes, for income from supplementary earners, and for imputed value of non-money items of income included \$609, \$214, and \$211 million, respectively, which represented the aggregate income of returns shifted upward from below the \$7,500 line.

² *Statistics of Income for 1935, Part I, Table 5*

of understatement, was relatively large for the income class directly below \$7,500, the number of returns shifting upward, and hence the aggregate income of the group shifting, was also large. Thus in the case of the adjustment for deductions and tax-exempt interest, almost one-half of the increase in aggregate income above \$7,500 represented the statutory net income of returns shifting from below the \$7,500 line plus their aggregate deductions and tax-exempt interest. The same is true of the adjustment for imputed value of non-money items of income. The aggregate amounts added as a result of the adjustments for understatement of incomes and for income from supplementary earners included even larger proportions representing the income of returns shifting upward; in the latter case, the amount added as a result of the shift is more than twice the amount of supplementary income added to the distribution above \$7,500.

Confining the discussion to the income added for specific adjustment items, it is interesting to note that the estimated \$545 million added for understatement of incomes is only slightly lower than the \$549 million added to allow for deductions and tax-exempt interest (less capital gains) reported by the net income classes above \$7,500, but that the distribution of these amounts among the several income levels is very different. Whereas an average amount of deductions and tax-exempt interest was added to returns at *each* income level—the amount ranging from approximately \$1,250 at the income level \$7,500–\$10,000 to as high as \$185,000 in the case of joint returns and returns of heads of families, and to \$630,000 in the case of separate returns of husbands, at the income level \$1,000,000 and over—an average amount of understatement was added at only *seven* income levels above \$7,500. In this case, the average amount of the correction item showed much less variation, ranging from about \$1,250 for the income level \$7,500–\$10,000 to \$2,250 for the income level \$40,000–\$50,000.

The average amount added for income from supplementary earners decreased as income rose, ranging from approximately \$300 at the income level \$7,500–\$10,000 to \$100 at the levels above \$25,000. Average amounts added for the imputed value of non-money items of income varied in the opposite direction, increasing relatively rapidly as income increased. Average amounts

added ranged from \$350 at the income level \$7,500–\$10,000 to \$25,000 at the income level \$1,000,000 and over.

The correction for nonreporting was made only for three income levels above \$7,500. Here, as in the adjustment to a 1935–36 basis, where a correction was applied at every income level, the average income within an income class remained unchanged, and the increase in the aggregate income was due entirely to the increase in the number of family units in the income range above \$7,500.

Of the seven types of adjustment, it appears that the aggregate income added by three, namely, the adjustment for net capital gains, deductions from gross income, and interest from tax-exempt securities, the adjustment for income from supplementary earners, and the adjustment for imputed value of non-money items of income, may have been too low. As noted above, the first of these adjustments fails to take account of several items of income that were excluded from gross income as defined by the provisions of the 1934 Revenue Act. The second adjustment, by correcting for earners rather than income recipients, by adding only a nominal amount at the very high income levels, and by omitting entirely the incomes reported on the returns of single men and women not heads of families, doubtless understated the amount of supplementary income received by family units in the upper income ranges. The value of non-money items of income in 1935–36 for these income classes has been estimated in a forthcoming report of the National Resources Committee⁸⁰ at a slightly higher figure than the total amount added here for this adjustment factor. In the case of the other types of adjustment, notably those for understatement, nonreporting and the difference in year covered, it is difficult to estimate whether they tended to overstate or to understate the amounts added to the aggregate income.

Certain of the adjustment steps seem to have introduced elements of bias into the distribution of aggregate income among the various income classes, thereby affecting the degree of equality of the income distribution. Thus the method adopted for pairing the separate returns of husbands and wives may very possibly have resulted in too great a degree of inequality in the resulting

⁸⁰ *Consumer Expenditures in the United States: Estimates for 1935–36*

income distribution of husband-wife units, which would be reflected in the final distribution.

The methods used in the addition of deductions and tax-exempt interest, on the other hand, led to a bias toward too great a degree of equality in the distribution. The correction for supplementary earnings and the lack of adjustments for possible evasions of income tax liability at the high income levels in the correction for understatement may have tended toward this same result. It does not seem feasible to estimate the relative influence of these conflicting tendencies on the final income distribution.

2 CHANGES IN FREQUENCY DISTRIBUTION

For the convenience of persons interested in following, in detail, the effects of the adjustment procedures, the actual frequency distributions obtained at various stages of the adjustment process are presented in Table 4, and the corresponding percentage distributions in Table 5. Returns of members of family units showing statutory net incomes of \$7,500 and over in 1935 numbered 211,374. The number of family units with incomes in this dollar range was raised, as a result of the series of adjustments, to a total of 470,851, an increase of almost 123 per cent. The addition of allowable deductions and of tax-exempt interest, items actually reported on the income tax returns, and the correction for understatement of incomes were primarily responsible for the movement of family units into this income range.

3 SUGGESTIONS FOR IMPROVED RESULTS

It seems likely that analyses of the income tax data similar in scope to that made by the National Resources Committee will be undertaken in the very near future. The experience of the National Resources Committee is of significance, not only as a means of evaluating the 1935-36 estimates of income distribution, but also because it suggests several ways in which improvements in basic data would make for improvements in methodology and in results.

a) *Individual income tax returns*

As already mentioned, additional tabulations of federal individual income tax returns, which would avoid the necessity for cer-

TABLE 4

FREQUENCY DISTRIBUTIONS BY INCOME LEVEL OF MEMBERS OF FAMILY UNITS WITH INCOMES OF \$7,500 AND OVER,
AFTER SUCCESSIVE ADJUSTMENTS OF DATA FROM FEDERAL INDIVIDUAL INCOME TAX RETURNS FOR 1935

DISTRIBUTIONS OF INDIVIDUAL RETURNS AS REPORTED IN <i>Statistics of Income</i> ¹					DISTRIBUTIONS OF RETURNS AFTER ADJUSTMENTS FOR NET CAPITAL GAINS, DEDUCTIONS FROM GROSS INCOME, AND INTEREST FROM TAX-EXEMPT OBLIGATIONS				DISTRIBUTION OF HUSBAND- WIFE UNITS AFTER PAIRING SEPARATE RETURNS OF HUS- BANDS AND OF WIVES (INCL. COMMUNITY PROPERTY RETURNS)	DISTRIBUTION OF FAMILY UNITS
INCOME CLASS		JOINT RETURNS AND RETURNS OF MALE AND FEMALE HEADS OF FAMILIES	SEPARATE RETURNS OF		COMMUNITY PROPERTY RETURNS	JOINT RETURNS AND RETURNS OF MALE AND FEMALE HEADS OF FAMILIES	SEPARATE RETURNS (INCL. COMMUNITY PROPERTY RETURNS) OF		COMMUNITY PROPERTY RETURNS)	
			HUSBANDS	WIVES			HUSBANDS	WIVES		
\$7,500-	\$10,000	60,722	9,331	4,509	6,092	81,000	14,750	7,800	18,205	99,205
10,000-	15,000	42,449	10,853	4,643	5,188	59,000	16,550	7,300	17,825	76,825
15,000-	20,000	14,852	6,252	2,459	2,070	17,000	8,450	3,300	12,388	29,388
20,000-	25,000	6,940	3,891	1,421	1,085	8,500	5,100	2,000	8,250	16,750
25,000-	30,000	3,617	2,659	867	614	4,800	3,350	1,250	6,362	11,162
30,000-	40,000	3,401	3,261	1,052	708	5,200	4,550	1,550	6,450	11,650
40,000-	50,000	1,587	1,799	626	310	1,800	2,550	750	3,670	5,470
50,000-	100,000	1,774	3,026	880	496	2,945	4,450	1,400	5,375	8,320
100,000-	250,000	320	926	278	77	405	1,150	325	2,266	2,671
250,000-	500,000	34	140	48	10	40	150	60	555	595
500,000-	1,000,000	9	48	12	7	13	80	18	152	165
1,000,000 and over		7	16	6	2	9	20	9	52	61
Total		135,712	42,202	16,801	16,659	180,712	61,150	25,762	81,550	262,262

INCOME CLASS		DISTRIBUTION OF FAMILY UNITS	DISTRIBUTIONS OF FAMILY UNITS AFTER ADJUSTMENT FOR.				IMPUTED VALUE OF NON-MONEY ITEMS OF INCOME ²	USE OF INCOME TAX DATA
			CHANGE FROM 1935 TO 1935-36 BASIS	NONREPORTING	UNDERSTATEMENT	INCOME FROM SUPPLEMENTARY EARNERS		
\$7,500- \$10,000	99,205	112,161	140,201	163,060	178,460	187,060		
10,000- 15,000	76,825	86,858	99,887	117,209	123,995	131,821		
15,000- 20,000	29,388	33,226	34,887	50,812	53,913	58,487		
20,000- 25,000	16,750	18,938	18,938	29,608	31,398	34,208		
25,000- 30,000	11,162	12,620	12,620	19,883	20,312	22,233		
30,000- 40,000	11,650	13,172	13,172	14,094	14,415	15,561		
40,000- 50,000	5,470	6,184	6,184	6,464	6,495	6,603		
50,000- 100,000	8,320	9,407	9,407	10,272	10,293	10,571		
100,000- 250,000	2,671	3,020	3,020	3,020	3,039	3,336		
250,000- 500,000	595	673	673	673	675	699		
500,000-1,000,000	165	187	187	187	187	197		
1,000,000 and over	61	69	69	69	69	75		
Total	262,262	296,515	339,245	415,351	443,251	470,851		

¹ *Statistics of Income for 1935*, Part I, Table 5.

² This distribution appears as the 'tail' of the income distribution of families presented in Table 3 of *Consumer Incomes in the United States*.

TABLE 5

PERCENTAGE DISTRIBUTIONS BY INCOME LEVEL OF MEMBERS OF FAMILY UNITS WITH INCOMES OF \$7,500 AND OVER, AFTER SUCCESSIVE ADJUSTMENTS OF DATA FROM FEDERAL INDIVIDUAL INCOME TAX RETURNS FOR 1935 ¹

DISTRIBUTIONS OF INDIVIDUAL RETURNS AS REPORTED IN <i>Statistics of Income</i> ²					DISTRIBUTIONS OF RETURNS AFTER ADJUSTMENTS FOR NET CAPITAL GAINS, DEDUCTIONS FROM GROSS INCOME, AND INTEREST FROM TAX-EXEMPT OBLIGATIONS				DISTRIBU- TION OF HUSBAND- WIFE UNITS AFTER PAIRING SEPARATE RETURNS OF HUS- BANDS AND OF WIVES (INCL. COMMUNITY PROPERTY RETURNS)	DISTRIBU- TION OF FAMILY UNITS
INCOME CLASS		JOINT RETURNS AND RETURNS OF MALE AND FEMALE HEADS OF FAMILIES	SEPARATE RETURNS OF		COMMUNITY PROPERTY RETURNS	JOINT RETURNS AND RETURNS OF MALE AND FEMALE HEADS OF FAMILIES	SEPARATE RETURNS (INCL. COMMUNITY PROPERTY RETURNS) OF		COMMUNITY PROPERTY RETURNS)	
			HUSBANDS	WIVES			HUSBANDS	WIVES		
\$7,500-	\$10,000	44.72	22.11	26.84	36.57	44.82	24.12	30.29	22.32	37.82
10,000-	15,000	31.28	25.73	27.64	31.14	32.05	27.06	28.34	21.86	29.29
15,000-	20,000	10.94	14.81	14.64	12.43	9.41	13.82	12.81	15.19	11.21
20,000-	25,000	5.11	9.22	8.46	6.51	4.70	8.34	7.76	10.12	6.39
25,000-	30,000	2.67	6.30	5.16	3.69	2.66	5.48	4.85	7.80	4.26
30,000-	40,000	2.51	7.73	6.26	4.25	2.88	7.44	6.02	7.91	4.44
40,000-	50,000	1.17	4.26	3.73	1.86	1.00	4.17	2.91	4.50	2.09
50,000-	100,000	1.31	7.17	5.24	2.98	1.63	7.28	5.43	6.59	3.17
100,000-	250,000	.24	2.19	1.65	.46	.22	1.88	1.26	2.78	1.02
250,000-	500,000	.03	.33	.29	.06	.02	.25	.23	.68	.23
500,000-	1,000,000	.01	.11	.07	.04	.01	.13	.07	.19	.06
1,000,000 and over		.01	.04	.02	.01	.3	.03	.03	.06	.02
Total		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

200

PART THREE

INCOME CLASS	DISTRIBUTION OF FAMILY UNITS	DISTRIBUTIONS OF FAMILY UNITS AFTER ADJUSTMENT FOR:				IMPUTED VALUE OF NON-MONEY ITEMS OF INCOME
		CHANGE FROM 1935 TO 1935-36 BASIS	NONREPORTING	UNDERSTATEMENT	INCOME FROM SUPPLEMENTARY EARNERS	
\$7,500- \$10,000	37.82	37.82	41.34	39.25	40.27	39.72
10,000- 15,000	29.29	29.29	29.44	28.22	27.97	28.00
15,000- 20,000	11.21	11.21	10.28	12.23	12.16	12.42
20,000- 25,000	6.39	6.39	5.58	7.13	7.08	7.27
25,000- 30,000	4.26	4.26	3.72	4.79	4.58	4.72
30,000- 40,000	4.44	4.44	3.88	3.39	3.25	3.30
40,000- 50,000	2.09	2.09	1.82	1.56	1.47	1.40
50,000- 100,000	3.17	3.17	2.77	2.47	2.32	2.25
100,000- 250,000	1.02	1.02	.89	.73	.69	.71
250,000- 500,000	.23	.23	.20	.16	.15	.15
500,000-1,000,000	.06	.06	.06	.05	.04	.04
1,000,000 and over	.02	.02	.02	.02	.02	.02
Total	100.00	100.00	100.00	100.00	100.00	100.00

¹ Based on Table 4.

² *Statistics of Income for 1935*, Part I, Table 5.

³ Less than 0.005 per cent.

tain arbitrary assumptions, would prove of great assistance to persons endeavoring to derive an income distribution of family units in the upper income brackets. Most important of these, perhaps, is a tabulation of the matched separate returns of husbands and wives, classified by their combined net incomes. Such a tabulation, on the basis of net income classes exclusive of capital gains and losses, is included in the project of the Treasury Department for the 1936 and 1937 returns and it is to be hoped that tabulations will continue to be made for future years. A similar tabulation of the community property returns of husbands and wives would make it possible to omit the arbitrary division of the income between husbands and wives, and the pairing of the returns into family units that was necessary in the National Resources Committee study.

For other types of returns as well, the special tabulations on the basis of net income exclusive of capital gains and losses will prove of great help, as will those assigning the various income and deduction items to the several groups of returns. The problem of adding other types of deduction as well as tax-exempt interest to the returns within each net income class, however, will still remain. As suggested earlier, a tabulation of the income tax returns on the basis of 'adjusted' net income classes (statutory net income plus the five types of deductions and minus capital gains) would be highly desirable, but one unlikely to be undertaken by the Bureau of Internal Revenue. An analysis of the error in the reported amounts of tax-exempt interest on the tax returns would make possible a more accurate adjustment for this factor. One of the most arbitrary adjustments made in the National Resources Committee estimates, the correction for nonreporting and understatement, could, of course, be greatly improved were it possible to obtain more definitive data on the extent to which these types of underreporting prevail. Unfortunately, accurate information in this field is about impossible to obtain.

b) *Sample income data*

If the primary objective in the collection of sample data on family incomes is to obtain a distribution of family incomes by size, using the income tax data for the upper income levels, it is obvious that the period covered by the two sets of data should be as

nearly as possible identical, and, therefore, that the sample income survey should be made on a calendar year basis. In this way an arbitrary correction of the income tax data to allow for the difference in reporting period, such as was made in the National Resources Committee study, can be avoided.

The more arbitrary aspects of the adjustment for supplementary family income could also be avoided, to a considerable extent, if the schedules recorded separately, where possible, incomes of supplementary income recipients from all sources, not just their earnings. A minor improvement would be possible if the tabulations of such supplementary income were made for persons over and under 18, rather than 16, years of age. Tabulations of the sample data on supplementary incomes and imputed value of non-money items of income for separate income levels above \$10,000 would afford a somewhat better guide than was available in this study for estimating the amounts of such income to be added at the very high levels.

It would also add to the reliability of the final distribution if it were possible to correct statutory net income, as reported in *Statistics of Income*, not only for capital gains, allowable deductions and tax-exempt interest, but also for certain other items included in total family income as defined in the Study of Consumer Purchases. This might be accomplished if the sample schedules and the tabulations isolated, at least for families above \$5,000, certain items of income that are specifically excluded from gross income by law; for example, incomes composed entirely or largely of state and municipal salaries, income from sources outside the United States, and amounts received through accident or health insurance under workmen's compensation acts.

Discussion

I A. J. GOLDENTHAL

To those interested in evaluating the reliability of estimates of the frequency distribution of income, this paper comes as a refreshing departure from earlier studies. For the first time we have not only a complete and detailed description of the statistical procedures followed in the construction of a distribution, but also an analysis of the limitations of the various adjustments. Any elaboration of this comprehensive and painstaking statement of methods and limitations may seem superfluous; but a brief comment on a few points in the analysis, by way of adding emphasis, seems desirable. In addition, advantage will be taken of the opportunity to put forward several suggestions.

1 COMBINING RETURNS OF HUSBANDS AND WIVES

As indicated by the authors, one of the most difficult problems confronting them was the task of pairing the separate income tax returns of husbands and wives as a step in obtaining family incomes. The procedure adopted embodied the extreme assumption that the husband with the largest income is married to the wife with the largest income, the husband with the next highest income to the wife with the next highest income, and so forth. The authors' discussion of this supposition seems inadequate. Inasmuch as the method of combining the separate returns of husbands and wives will to a large extent¹ determine the aggregate income and the number of families in the upper income brackets, and as these have a significant effect on estimates of savings based on the income distribution, some further analysis of the validity of this assumption seems desirable.

¹ Of the 3,492 families with incomes of \$100,000 and over, 3,025 are the result of pairing the separate returns of husbands and wives. These figures are before adjustments for the difference in period, nonreporting, etc (see Table 4)

The choice of this method of combining the separate incomes of husbands and wives is predicated on the general assumption that husbands and wives filing separate returns endeavor to divide their total incomes as evenly as possible in order to avoid the heavy surtaxes prevailing in the high income brackets. The possibility that similar social and economic status might lead high-income husbands to marry high-income wives is also mentioned.

Considerable division of income between husband and wife doubtless has taken place in order to lower the tax charge. Indeed, analysis of federal income tax data reveals that in the higher income brackets the proportion of all returns that are filed separately by wives has increased substantially over the last two decades. However, there are many influences at work that should be examined before deciding how the incomes of husbands and wives are likely to be related.² Among these are the present gift tax which acts so as to prevent to a considerable extent the division of income between husband and wife;³ the vigilance of the Bureau of Internal Revenue in examining transfers of property from husband to wife or vice versa with the view of determining whether the transfer is bona fide; the impossibility of legally dividing the non-property income of one spouse, such as salaries and fees; the fact that the source of a considerable number of high incomes is a large capital gain which may have resulted from transactions involving property legally owned by the husband or the wife and, therefore, part of his or her taxable income; and the reluctance of many wealthy individuals to lose control over their property. One could cite numerous instances of common knowledge where a high-income husband or wife is married to a spouse of moderate income with the likelihood of any substantial division of income being slight.

In addition to the above considerations which seem to indicate

² The following discussion is not intended to apply to community property returns. The reported incomes of husband and wife in the eight states having the community property law are more nearly equal than in the other states. Probably a different procedure should be followed in matching the separate returns of these eight states. It should be realized, however, that because of the exclusion of certain income from the community property provisions, the reported incomes of husbands and wives in these states are not necessarily equal, though for many couples this is the case.

³ See Mabel Newcomer, 'Estimate of the Tax Burden on Different Income Classes', in *Studies in Current Tax Problems* (Twentieth Century Fund, 1937), p. 37

that the facility with which income is divided between husband and wife has been exaggerated, there is statistical evidence on the subject, none of which seems to support the assumption adopted. The substantial number of large incomes in the Bureau of Internal Revenue classification headed 'joint returns of husbands, wives, and dependent children and returns of either husband or wife when no other return is filed' is in itself evidence that high incomes in many cases are not divided between husband and wife. From this it follows that even when separate returns are filed the incomes need not be divided as equally as possible and that a high-income husband is not always married to a high-income wife.

More direct information on this matter is available from the *Statistics of Income for 1916*. While the data are probably not entirely pertinent because of the time interval that has elapsed, the manner in which the separate returns of husbands and wives were tabulated in this issue of *Statistics of Income* does throw some light on how their incomes are related. For that year the return of a wife filing separately was placed in the combined income class of husband and wife. The husband's return also was put in this class. By comparing the average size of the combined income in a given class with that of the wives in the same class, one obtains some idea of the division of income between husband and wife in that year. The data indicate that for the higher income classes the average income of the wife was but a small fraction of the combined income of husband and wife. Thus for the income class \$1,000,000 and over, which contained 86 couples, the wives' average income was less than 9 per cent of the average of the combined income of husbands and wives. Under the assumption adopted in the study of the National Resources Committee, the income of a wife would be, in this income bracket, almost one-half of the total income of husband and wife. Undoubtedly a greater proportion of women had independent incomes in 1935-36 than in 1916. Moreover, the rise in the surtax rates since 1916 has increased the incentive to divide the income within the family. Taking into account both these factors, it is nevertheless quite unlikely that the relation between the incomes of husbands and wives has changed as much as the procedure in this study assumes. It should perhaps be mentioned in connection

with the relevance of these data that in 1916 the income tax law had been in effect for four years, that the surtax rates, while small when compared with those of subsequent years, did rise to 13 per cent, and that no gift tax was levied.

The most important body of information on the pairing of the separate incomes of husband and wife are the tabulations of the 1936 Wisconsin individual income tax returns contained in Volume I of the Wisconsin series.⁴ Although Miss Baird and Miss Fine warn readers (footnote 12) against drawing conclusions from the Wisconsin study, it does appear that these tabulations can serve to indicate the relationship of the separate returns of husbands and wives. As the authors point out, the reporting requirements of the federal income tax law and of the Wisconsin law differ. Under the Wisconsin law separate returns are required whenever both husband and wife are income recipients; in contrast, the federal law provides that the husband may include his wife's income with his own and file a joint return or they may file separately. However, this difference does not greatly impair the usefulness of the tabulations for the present purpose. If the combined income of a couple is in the federal surtax brackets, separate returns will generally be filed under both the federal and Wisconsin laws. The one exception is when one of the couple has a deficit, in which event a joint return would probably be filed under the federal law and separate returns under the Wisconsin law.⁵ Aside from this exception, it is virtually certain that if either spouse is in the surtax brackets, separate returns will be filed under both income tax laws.

Inspection of Table 7.0 of Volume I of the Wisconsin series reveals that the wives of husbands with high incomes are widely

⁴ *Wisconsin Individual Income Tax Statistics: 1936 Income*, Vol. I, *Tax Analysis*. The results of this study were not available when the National Resources Committee estimates were prepared.

⁵ This would not always be true. Because of the unlimited deduction of capital losses under the Wisconsin law as compared with the \$2,000 limitation the federal law imposes and because of the exclusion and deduction of certain types of income (chiefly the exclusion of income from property outside Wisconsin and the deduction of dividends received from Wisconsin corporations and federal income taxes paid), it is quite likely that an individual might have a deficit under the Wisconsin law but a positive net income under the federal law. Furthermore, it is stated in Vol. I of the Wisconsin series that "although married couples, each having income, should file separate returns, this practice is not always followed" (p. A108).

dispersed throughout the income range. Curiously enough the table shows that none of the husbands in the income class of \$100,000 and over is mated with a wife in the income class of \$50,000 and over. As an experiment, the method followed in the National Resources Committee estimate was applied to the separate returns of husbands and wives filed in Wisconsin for 1936. The resulting distribution was then compared with that of the paired incomes of the same husbands and wives in Table J (p. 19) of Volume I. The application of the National Resources Committee method of combining the separate returns of husbands and wives yielded 47 per cent more couples with incomes of \$100,000 and over than were shown in Table J.⁶ There was also a 65 per cent increase in the aggregate income of this class. Though the number of Wisconsin returns in the high income brackets is small⁷ and there may be some question concerning the representativeness of the Wisconsin data, it seems reasonable to accept these findings as roughly comparable with those which would be obtained by treating the federal income tax data in a similar fashion.

In the light of the preceding discussion the unavoidable conclusion seems to be that a less extreme procedure would have more accurately combined the incomes of husbands and wives. As a consequence of the method adopted in the National Resources Committee estimate the number of couples in the high income brackets is overstated. To a greater degree the same is true of aggregate income. Consequently, the number of families in the middle-income brackets is too small. The results of the Treasury tabulation of the 1936 returns, which will show the sep-

⁶ This is an understatement since those returns in which one spouse had a deficit were eliminated from the data. As mentioned above, many of those with a deficit under the Wisconsin law would not have a deficit under the federal law and should, therefore, be included in the comparison.

⁷ There were 15 couples with incomes of \$100,000 and over, excluding those with a deficit for one spouse. If the analysis is extended to the lower income brackets, the following results are obtained: the percentage increase in the number of couples as determined by the National Resources Committee method, over the comparable figure in Table J, is 17 per cent for the \$50,000 and over class and 15 per cent for the \$20,000 and over class. The percentage increases in the aggregate income are 27 and 19, respectively. Returns were filed by 67 couples with net taxable incomes of \$50,000 and over and by 302 with incomes of \$20,000 and over. Interpolation within the rather broad income classes of Table 7.0 may be the source of some error, which, however, is not believed to be serious.

arate returns of husbands and wives paired into family units, will indicate the extent of the necessary revisions.

2 ADJUSTMENTS FOR DIFFERENCES IN INCOME CONCEPTS

The inclusion in the federal income tax data of realized capital gains and losses has proved to be a source of difficulty for those statisticians who wished to exclude such income from their distributions. In the previous size distribution estimates no attempt was made to eliminate this type of income either because of the intention of the investigator to include it, or, if the desire was to exclude capital gains and losses, because of the impracticability of any adjustment.⁸ In the National Resources Committee estimate the attempt was made to exclude all realized capital gains and losses from the income tax data.⁹ The exclusion of capital gains and losses was accomplished together with addition of the five deduction items and tax exempt interest in the following manner: the aggregate amount of the five types of deduction plus tax-exempt interest minus capital gains was added to each income level. Then, by assuming that each return within an income class reported the class average of these items, certain proportions of the returns of each class were shifted to adjacent income classes if the addition of the average amounts increased the size of the incomes sufficiently.

Because of the nature of capital gains, the question arises as to the extent of the bias imparted to the final distribution by this procedure. It has long been known that capital gains are often sporadic and large and that this type of income is one of the chief sources of the large incomes reported in *Statistics of Income*. Abundant data have recently become available that reveal to what extent this is true.

Table 7 of *Statistics of Income for 1935* indicates that only a portion of the returns in each income bracket, varying from one-half of the returns with net income of \$1,000,000 and over to one-seventh of those in the \$5,000 to \$6,000 class, report income from capital gains. Furthermore the 1935 *Statistics of*

⁸ On this point see the remarks of Clark Warburton, *Studies, Volume One*, pp 98-9

⁹ This adjustment, however, is not in accord with the income concept of the study which included realized capital gains and losses on assets bought and sold within the given year; see below.

Income text table (p. 18) cross-classifying net capital gain by net income shows that the size of the capital gain varies widely within an income class and that a great many returns report a capital gain large enough to constitute a substantial proportion of net income. Selecting the \$100,000 to \$150,000 class as an example the following data may be cited: The average net capital gain for the 1,395 returns in this group was \$11,450. Examination of the table reveals no tendency for the returns in this income bracket with a net capital gain to cluster about this average. For the 712 returns reporting a capital gain, the average was \$22,700. Of these, 192 had a capital gain of above \$25,000 and 38 a gain of \$100,000 and over. The Wisconsin data are also informative in this connection. In 1936 16 per cent of the returns with statutory total incomes of \$5,000 and over reported a capital gain as a principal source of income.¹⁰

The use of average amounts in the adjustment for capital gains may considerably distort the distribution, especially in the upper income brackets. In contrast to the National Resources Committee method which shifts all returns to a slightly lower income level, a procedure based on the distribution of capital gains would have redistributed a portion of the returns throughout the income scale, while the rest would not be moved at all. Such an adjustment could have been accomplished in this study by treating capital gains separately. While, as the authors indicate, it is impracticable to adjust individually for each item to be added to or deducted from net income, it does seem feasible to adjust separately for the exclusion of capital gains. With the use of the text table in *Statistics of Income for 1935* cross-classifying net capital gain by net income, returns reporting capital gains could be transferred to their appropriate income class. Average amounts of the other items could be added to these returns.

The income concept adopted in the National Resources Committee frequency distribution includes realized capital gains and losses on assets bought and sold within the schedule year. However, in the treatment of the income tax data no attempt was made to incorporate such gains or losses. That these gains

¹⁰ Text Table G (p. 21) Vol. IV A of the Wisconsin series. The largest item on a single and double source return and the two largest items on a multiple source return are defined as principal sources. Capital gains in excess of \$5,000 have been included as principal sources.

would be fairly large may be inferred from a special Treasury tabulation for 1934 of capital gains and losses classified according to the length of time the capital asset was held. This tabulation shows that for those with net incomes of \$5,000 and over the total of the net capital gains on assets held one year or less was equal to two-thirds of the statutory net capital gain of the same income group.¹¹ While the concept of capital gains on assets held one year or less is more inclusive than a concept of gains on assets bought and sold within a calendar year, the amount under the latter concept would be fairly large. On the other hand, some capital losses should have been included. The Treasury tabulation cited above indicates that for returns of \$5,000 and over, the aggregate net capital loss from assets held one year or less amounted to one-half of the total statutory net capital loss for this income group. For the year 1935-36, the net result of the failure to take these two items into account is to understate the income of those in the upper income brackets as well as to place many families and individuals in the wrong income class.

In the above comment on the method of passing from statutory net income to the income concept of this study, the adjustment for capital gains has been singled out largely because it was thought that the assumption upon which the entire shift in income concepts was based is weakest for this item. However, the general conclusions with respect to exclusion of capital gains apply, though with less force, to addition of tax exempt interest and the five types of deductions. Table 7 of *Statistics of Income* shows that only a portion of the returns—larger, however, than in the case of capital gains—report each type of deduction. It is possible that an analysis of the Wisconsin tabulations may be fruitful in providing a basis for appraising the procedure employed in the passage from net income to the desired income concept. The 1936 Wisconsin returns are already tabulated according to 'taxable net income', roughly comparable to the 'net income' concept of the federal income tax data, and according to an 'income bracket' concept that approximates the concept in the National Resources Committee study. The effect by income classes of transforming the Wisconsin distribution from a classification by

¹¹ *Statistics of Income for 1934*, Supplement, Sec. II, 'Capital Gains and Losses', Table I (U. S. Treasury Department).

net taxable income to one by income bracket may be compared with the effect of the similar adjustment for income concepts made in the study under consideration. However, careful examination of the differences in the income items involved in the two adjustments will be necessary. Since this suggested analysis will probably be the only method available in the near future for evaluating this aspect of the National Resources Committee estimates, it is desirable that it be undertaken.

3 NONREPORTING AND UNDERSTATEMENT OF INCOMES

Sweeping adjustments of an essentially arbitrary nature for non-reporting and understatement of incomes have invariably followed painstaking and time-consuming statistical treatment of income tax data in the construction of the earlier distributions. Such a sequence has always seemed anomalous. It is also present in the study under consideration. The call by Miss Baird and Miss Fine for more definitive data on the extent to which these types of understatement prevail brings to mind F. R. Macaulay's suggestion of seventeen years ago for a universal and compulsory census of incomes in which the giving of false information would be severely punished. From the very nature of the information desired it is virtually impossible to obtain it directly. Nevertheless, if the reliability of frequency distributions of income is to be improved, some basis for adjusting income tax statistics superior to that of expert opinion is urgently needed. The only checks on the present method of making these estimates are the opinions of other experts, which vary widely, and independent estimates of the size of the aggregate income of all families and individuals. Segregating those sources of income most likely to be understated, such as fees, rents, profits from business, royalties and other income, is a step in the proper direction, but unfortunately data necessary to determine the degree of understatement at the various income levels are lacking.

It may be that progress in dealing with this problem can be achieved by classifying the income tax returns by occupation and industry,¹² and then making separate estimates for nonreporting

¹² Recent issues of *Statistics of Income* present a size distribution of net profit or loss from business in a rather broad industrial classification (Table 8). Information for recent years from income tax returns on the occupational distribution of in-

and. underreporting for each occupation and industry. Independent information on the incomes of an occupation or industry would provide the basis for these adjustments. Even though such information may be quite meager, this procedure should be more satisfactory than one involving over-all estimates for the entire distribution.

The recent passage by Congress of a law subjecting the salaries of the employees of state and local governments to federal income taxation has eliminated for the immediate future the necessity of including these income recipients in the allowance for nonreporting. However, sufficient data seem to be available to construct a tolerably accurate size distribution of the salaries of non-federal government employees for 1935-36.¹³ If this were done it would have the desirable effect of reducing the area covered by the estimate for nonreporting.

Another of the unknown quantities in size distribution estimates is the influence of legal evasion on income tax data. The absence of quantitative knowledge of this factor virtually precludes the possibility of ascertaining the direction and extent of the bias that may characterize an income distribution. The Treasury undoubtedly has information on the prevalence, in the past, of the various methods for reducing income.¹⁴ An investigation of the Treasury information should indicate the importance of this factor for frequency distributions of income. Provided the data do not disclose individual incomes it may be possible to secure this information from the Treasury Department.

The National Resources Committee staff has accomplished the formidable task of transforming an original distribution with aggregate income of \$3,712 million to one with \$8,030 million. The inadequacy of the data in relation to the assignment con-

come seems to be confined to the Wisconsin data (Vol III). However, the 1916 *Statistics of Income* did present an occupational classification by income classes (Table 6c). The Treasury also made a special tabulation of the incomes of dentists for 1929.

¹³ The Division of Tax Research of the Treasury has constructed such a distribution. See *Hearings before a Special Committee on the Taxation of Governmental Securities and Salaries*, U. S. Senate, 76th Cong, 1st Sess., p. 724. This distribution is presented by Miss Baird and Miss Fine in footnote 25.

¹⁴ See *Hearings before the Committee on Ways and Means—Tax Evasion and Avoidance*, 75th Cong, 1st Sess., especially pp. 24-33.

fronting the estimators has necessitated several procedures that are open to question. Further investigation of their validity is advisable. Fortunately, valuable data on some of the steps in the adjustment will become available in the near future. This information as well as more intensive analysis of existing data may indicate that revisions in the original estimate are needed. However, as stated by the authors, there are important gaps in our statistical information that projected studies will not fill.

Part Four

THE VOLUME AND COMPONENTS
OF SAVING IN THE UNITED STATES

1933-1937

R. W. GOLDSMITH

WITH THE ASSISTANCE OF

WALTER SALANT

RESEARCH AND STATISTICS SECTION
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R. W. GOLDSMITH AND WALTER SALANT

THE VOLUME AND COMPONENTS
OF SAVING IN THE UNITED STATES
1933-1937

R. W. GOLDSMITH

WITH THE ASSISTANCE OF
WALTER SALANT

THIS report of a new attempt to measure the volume and the components of saving in the United States, made in the Research and Statistics Section of the Trading and Exchange Division of the Securities and Exchange Commission,¹ consists of two parts. The text describes briefly the basic principles used in deriving the estimates and presents a summary of the results of the calculations for 1933 through 1937. The many controversies that have been in progress during recent years concerning the concepts and procedures usually involved in any attempt to measure saving have been discussed only in the briefest form and only so far as discussion seemed essential to an understanding of the methods actually used. The Appendix describes in some detail the individual series used in building up the estimates, setting forth the sources from which the material was derived and explaining the adjustments made on the raw material.

Any calculation of the volume of saving is, to a considerable extent, of a hypothetical or 'constructed' character, even more so than the measurement of national income though less than the estimation of national wealth. If we are not to lose ourselves in a maze of confusion we must adhere to a consistent set of ac-

¹ This report has not been passed upon or approved by the Securities and Exchange Commission. Responsibility for the estimates or statements made rests upon the authors.

counting principles in our calculations, irrespective of whether they are actually applied by the parties to the transactions we measure. For this study we have, with few exceptions, accepted the accounting principles now generally in use among business enterprises and have tried to apply them to unincorporated businesses, households, and government units.

It has been claimed, however, that a scientific calculation of such magnitudes as national income, national wealth, investment, and saving, should go a step further and modify the accounting methods current in business practice wherever adjustment is necessary to make them conform to the concepts developed by economic theory. In this study we have made such adjustments only on one of the most obvious and most important points: we have tried to eliminate write-ups and write-downs and capital gains and losses from the calculation of saving. A strong case can also be made from a theoretical point of view for the elimination of inventory profits and losses. Elimination of the difference between depreciation allowances calculated on the basis of original cost and of replacement cost also deserves serious consideration but happens to be of small numerical importance for the period studied. Inventory profits and losses of corporations have not been excluded because the material is, as yet, lacking to eliminate them consistently and because doubt exists as to how such an adjustment should be made.

The calculation of the volume and components of saving in the United States presented in this paper makes use, in general, of methods and techniques already applied in this field and is based on statistical raw material, most of which is available to all students. It claims to differ from previous attempts at a comprehensive measurement of the volume of saving mainly in its more consistent adherence to accounting concepts. The estimates are, nevertheless, still preliminary and, on many points, far from satisfactory. Many of the constituent series can be improved considerably even without the collection of new basic data.² That both the theory of measuring saving and the statistical procedures adequate for such measurement are still in a rather rudimentary stage and have not enjoyed the thorough discussion that has gone

² For a list of the major deficiencies and suggestions for additional material needed for more satisfactory estimates, see Sec IV, 3 below

a long way toward elucidating similar problems in the field of national income³ may be advanced as a partial explanation for the deficiencies of this investigation. Finally, the form of the paper has been strongly influenced by its origin as a study made for the internal use of the Securities and Exchange Commission. Limitations of time have made it necessary to restrict changes in the original version to the relatively secondary matter of presentation and to revisions of series that do not require a considerable amount of statistical spade work.

Perhaps a word is necessary concerning the reason for this attempt to measure the volume and components of saving since we possess at least the principal material and the methods required to derive fairly reliable estimates of the annual volume of investment in the United States.⁴ It might seem that there is little point in an attempt to derive the same figures again through a calculation of 'saving'.⁵ Indeed, there would not be, were the aim solely to arrive at a national aggregate of saving, except that such an estimate should provide a certain check on the estimates of investment. But the significance of attempts to measure national saving lies elsewhere. What is of importance is not so much the final aggregate but the components that indicate the persons or institutions performing the saving and the forms the change in asset-holding takes. Such a picture, which cannot be

³ See e.g., *Studies, Volumes One and Two* (1937 and 1938).

⁴ See particularly the studies of the National Bureau of Economic Research. Simon Kuznets, *National Income and Capital Formation, 1919-35* (1937) and *Commodity Flow and Capital Formation, Volume I* (1938); and Solomon Fabricant, *Capital Consumption and Adjustment* (1938). Another comprehensive estimate by Mr. Terborgh has now been published in part in the *Federal Reserve Bulletin*, 1939, pp. 731-6. We used an earlier unpublished draft in which a few figures differ slightly from those published.

⁵ In making this statement we take the prevailing use of terms among students of the subject to be such that for any period investment and saving are equal, if measurements are made—as in actuality they must be—at the end of the period. To maintain the equality it is necessary to regard the cost of distribution of new securities and similar costs involved in other forms of saving as services equivalent to capital expenditures (Cf. Clark Warburton, *Volume One*, pp. 101-104). It is also assumed that the difference between the Keynesian definition of saving (used here) and the Robertsonian concept is not of great importance statistically unless the period is much shorter than the annual intervals used in this study. (The same conclusion is reached by Gottfried Haberler, *Volume Two*, p. 164).

obtained from statistics of investment, is essential to any thorough analysis of the capital market.

I Definitions

By net saving we mean the part of the national income of residents of the United States earned ⁶ during any year that is not spent during the same period on consumption goods and services.

Using the concepts of accountancy we measure net saving as the difference between current income and expenses (including payments to equity owners) of all household,⁷ business, and government units in the United States or by the equivalent of this difference, the change in the earned surplus of all such units. The theoretical basis and some details of this measurement will be explained in the next section.

Gross saving is defined as net saving plus depreciation allowances on the stock of durable assets held by all households, business and government units. Depreciation allowances are taken from the books wherever they are specifically entered, (i.e., for business corporations). For economic units not recording depreciation allowances in their books resort must be had to rough estimates.⁸

II Four Methods of Measuring Saving

Net saving can be calculated by two methods which may be called, by their origin, the income account and the balance sheet measurements respectively. Both the income account and the balance sheet measurements, in turn, can be based on either sample or overall data. If errors and omissions could be avoided the numerical results of the calculation of net saving for any group of accounting units would, of course, be the same irre-

⁶ Earned income excludes capital gains and losses and other revaluation items

⁷ The term 'household' is here used to include, in addition to households and unattached individual consumers, trust funds, unincorporated businesses (except farm enterprises), and private non-profit organizations

⁸ Some of the problems arising in connection with the measurements of depreciation allowances are discussed below in Sec III, 3

spective of whether calculated by (1) the sample balance sheet method, (2) the overall balance sheet method, (3) the sample income account method, or (4) the overall income account method.

1 BALANCE SHEET AND INCOME ACCOUNT METHODS

The change in the earned surplus of any accounting unit can be ascertained both from its income account and from its balance sheet. In the income account it appears as the difference between (1) current income and (2) current expenses (including income tax payments) plus dividend payments to equity owners (or other entrepreneurial withdrawals), omitting from both sides all revaluation items, which include capital gains and losses.⁹ In the balance sheet the earned surplus represents the difference between the depreciated cost of assets on the one hand, and liabilities plus the net contribution to the enterprise by equity owners on the other.¹⁰ The change in the earned surplus, as calculated by the balance sheet method, therefore, is equal to the change in the depreciated cost of assets minus the change in the liabilities and in the net contribution of equity owners, again excluding revaluation items throughout.

These two methods of measuring saving, which are fairly familiar with respect to business enterprises, can likewise be applied to households,¹¹ non-profit organizations,¹² government units and, finally, to the nation as a whole. We may attempt to find the total current income of all economic units and to deduct their total current expenses as shown in their actual or hypothetical ('constructed') books. Or, we may ascertain for each economic unit the change in its earned surplus (thus excluding changes resulting from (a) net capital contributions and (b) re-

⁹ For more details see Sec III, 2 below

¹⁰ This contribution is calculated by subtracting from the total amount received from equity owners in payment for the securities of the enterprise (irrespective of whether reflected on the books as capital or capital surplus) the amounts returned to them on the occasion of the retirement or repurchase of equity securities. Revaluation items are excluded.

¹¹ In the balance sheets of households no account is taken of stocks of non-durable consumers' goods (i.e., all consumers' goods except houses, automobiles, furniture, and household machinery). This corresponds to the omission of expenditures and depreciation on non-durable consumers' goods from the income account measurement of saving.

¹² This group of economic units comprises, e.g., foundations, universities, hospitals, and churches.

valuations and capital gains and losses) and add the figures so obtained.

In the process of adding the balance sheets of all economic units, all claims, liabilities, and debt securities cancel out, leaving among the assets only tangible property and the (cost or capitalized) value of certain privileges (mainly patents and similar rights)¹³ with 'equity' as the balancing item on the right side.¹⁴ The combined balance sheet of all economic units thus reduces to a statement of the depreciated cost of national physical wealth (plus certain privileges) and its ultimate ownership.

2 SAMPLE AND OVERALL METHODS

For both the balance sheet and income account measurement an attempt can be made to cover all accounting units of a specific type, or even all such units in the United States. Such attempts may be designated the overall varieties of these two basic methods. Alternatively, calculations of total saving may be based on the records of a relatively small sample of accounting units.

For the income account measurements, the overall approach demands data on or estimates of the total current income and expenses of all accounting units. Such figures can, in general, be estimated only by indirect methods, and with scant reliability for household units. For business units and the federal government, on the other hand, the aggregations of profit and loss or budget accounts provide relatively comprehensive and reliable information.

As a rule, household and government units do not compile, and rarely publish, balance sheets. It is, therefore, not feasible to measure changes in certain assets and liabilities of all household and government units from aggregations of compiled balance sheets, as can be done for corporate business units. This

¹³ This item, to which M. A. Copeland draws attention (see Discussion II) is probably very small in comparison to tangible property if actual balance sheets are taken as the basis of calculation.

¹⁴ This statement is strictly correct only for a closed economy. If the consolidation is carried through solely for one country, there also remains an item, either on the assets or the liabilities side, reflecting the net balance of international claims (including ownership rights) or of international liabilities (including foreigners' equity).

deficiency can be largely remedied by obtaining from other sources statistical information on the total of certain assets and liabilities of all household and government units.¹⁵

The sample methods, ordinarily used solely for household units, always start from the balance sheets or income accounts of relatively few units. Even the largest sample of this type, that used by the National Resources Committee in its study of consumer expenditures in the United States for the year 1935-36, contained only about 43,000 households. The data in the sample are then multiplied by appropriate coefficients to yield an estimated figure for the total population from which the sample was taken.

3 COMPARABILITY OF METHODS

Since both the balance sheet and the income account measurement of saving do in principle yield the same figures, estimates for different groups of accounting units derived by the two methods can safely be combined. This substitutability of the two measurements is of very great practical importance. The statistical material at our disposal is such that the income account measurement constitutes the only practicable approach for certain groups of accounting units while we are restricted for other groups to the balance sheet measurement.

With the material now available the income method is, practically speaking, the only possible approach for government units and the preferable approach for corporations. For households, on the other hand, we must work with the balance sheet method since current and comprehensive data that would make possible a determination of the saving of households by the income account method are not available.

¹⁵ The bank deposits of all households, e.g., can be derived with fair reliability from banking statistics (which also show separately the deposits of government units) supplemented by estimates of bank deposits of business corporations derived from their aggregated balance sheets. Or the change in the holdings of securities by households (excluding realized and unrealized capital gains and losses) can be calculated from statistics of new issues and retirements in conjunction with information on changes in the security holdings of foreigners and of domestic corporations and government units.

4 METHODS USED IN THIS STUDY

The figure for total saving presented in this study is the sum of the estimated saving of individuals,¹⁶ farm enterprises, corporations and government units. The series for saving of individuals and farmers has been built up from separate estimates of the change in individuals' and farmers' equity in various types of assets with due consideration for changes in corresponding types of liabilities. The saving of government units and of corporations have been obtained by subtracting from estimated or reported current income the sum of current expenses (excluding capital expenditures) and dividend payments.

The major components of total saving have, with few exceptions, been built up from overall rather than from sample statistics.¹⁷ Both income account and modified balance sheet methods¹⁸ have been used, the former for corporations and for government units, the latter for individuals and farmers.

5 PREVIOUS ATTEMPTS TO MEASURE SAVING

To our knowledge, only two comprehensive attempts have been made to measure saving in the United States by the income account method. The first was undertaken by the Brookings Institution for 1929,¹⁹ the second by the National Resources Committee for the year 1935-36.²⁰ In both, the estimation of individuals' saving was based on the sample method. The relations

¹⁶ The term 'individuals' always includes unattached individuals, households, trust funds, unincorporated non-agricultural businesses, and non-profit making organizations such as churches, universities, foundations. For types of saving omitted in this study see IV, 3 below

¹⁷ A few of the many basic series have been derived from figures that do not cover the entire field, but in many of these the data cover over 90 per cent of the entire field. Several overall figures taken from other sources were derived by the original estimators from large samples.

¹⁸ The modification introduced into the balance sheet method lies in computing directly the *changes* in particular assets and liabilities and adding these changes to obtain an aggregate figure for saving without ever estimating total actual net assets at any moment of time. This modification, which has both theoretical and practical advantages, does not affect the principle underlying the balance sheet method of measuring saving.

¹⁹ Maurice Leven, H. G. Moulton, and Clark Warburton, *America's Capacity to Consume* (Brookings Institution, 1934)

²⁰ Contained in a forthcoming report *Consumer Expenditures in the United States*

between saving and income for different levels of income obtained in the Brookings study were used by several authors to estimate saving for fairly long periods, sometimes more than a decade distant from the base year, 1929.²¹

The only serious attempts to measure saving of individuals over several years by the balance sheet method, of which we know, were made by W. H. Lough for 1919 to 1931,²² and Walter Lederer for 1925-1930.²³ It is our opinion that both these attempts, as well as several less comprehensive and less satisfactory efforts, did not result in adequate and comprehensive estimates because of their failure to approach the problem consistently with the appropriate methods of accounting.²⁴

III Some Special Problems of Measurement

1 STANDARD OF MEASUREMENT

All estimates of saving in this study are expressed, in principle at least, in current dollars. For both theoretical and practical reasons no attempt has been made to reduce the estimates expressed in current dollars of different years to any common denominator. Foremost among these reasons is the absence of any ultimate yardstick or physical measurement of saving that

²¹ Clark Warburton, 'The Trend of Savings, 1900-1929', *Journal of Political Economy*, XLIII (February 1935), 84-101 (for 1914 to 1929), Mordecai Ezekiel, 'An Annual Estimate of Savings by Individuals', *Review of Economic Statistics*, XIX (November 1937), 178-91 (for 1918 to 1935).

The estimates of saving derived by W. W. Leontief for 1919 ['Quantitative Input and Output Relations in the Economic System of the United States' *Review of Economic Statistics*, XVIII (August 1936), 105-25], and 1929 [unpublished manuscript] as a byproduct of his analysis of production and consumption statistics may in essence be regarded as similar to the income account measurement. They differ, however, from the estimates of the Brookings Institution and the National Resources Committee in that no figures are obtained for the saving of individuals at different income levels.

²² *High Level Consumption* (McGraw-Hill, 1935).

²³ Jacob Marschak and Walter Lederer, *Kapitalbildung* (London, 1936).

²⁴ The calculations made by F. G. Dickinson and Franz Eakin for 1929 are nearer in their methods to our estimates than any of the other attempts and include figures both for the balance sheet and the income account methods of measuring saving. See *A Balance Sheet of the Nation's Economy*, Bureau of Business Research, University of Illinois, Bulletin No. 54 (Urbana, Nov. 24, 1936).

would make it possible to compare the dollar volume of saving at different times.²⁵

Quantitative data on saving acquire their economic meaning chiefly in comparison with contemporary monetary magnitudes (such as the national income) or in an analysis of the various components of the saving process. For these purposes, reduction to a common denominator obviously is unnecessary.

A particular problem is created through the use of depreciation allowances, which in their original form often do not represent current values. This difficulty, which will be discussed briefly below, exists only for net saving.

2 REVALUATION ITEMS

The change in the earned surplus over a period is equal to the difference between current income and current expenses plus dividend payments to equity owners, excluding all revaluation items from both sides. These revaluation items are of three types: (a) write-ups and write-downs; (b) the difference between cost and balance sheet value of inventories, which may be regarded as a special case of (a); (c) realized capital gains and losses.

a) Current income is almost unanimously held not to include profits and losses representing write-ups or write-downs of assets or liabilities. Attempts have been made in this study to eliminate such write-ups or write-downs wherever they are apparent. It is possible, however, that a considerable amount of similar revaluations included in the basic series used in the

²⁵ Deflation of the annual dollar volume of saving by a price index of durable goods is not adequate for this purpose. From a theoretical point of view one might think of comparing the utility of the consumption goods purchasable at a certain time with the yield of a certain amount of saving made at different times, or of the utility, properly discounted for the interval until maturity, of the most preferred bundle of yields of the assets purchasable, at different points of time with a certain amount of saving. See H. Makower and J. Marschak, 'Assets, Prices and Monetary Theory', *Economica*, V (August 1938), 266. These concepts, however, are too vague for translation into actual measurement.

With respect to the value of investment, on the other hand, a certain basis exists for the reduction to a common denominator in the fact that investment results in plant, equipment, and stocks measurable in physical quantities. The practical difficulties of finding a common denominator and calculating adequate index numbers are, however, forbidding. See M. A. Copeland and E. M. Martin, *Volume Two*, pp. 88-99, 106-7.

preparation of the final estimates may have escaped detection and elimination.

b) Inventory profits and losses should also be excluded from current income and from earned surplus since they are essentially equivalent to write-ups or write-downs.²⁶ This adjustment which, of course, is necessary only where figures from actual books of account embodying such a difference are used (i.e., in this study in the net saving or dissaving of corporations alone) has not been made in the figures presented in this paper. This admittedly important adjustment has been omitted because the estimates of corporate saving also require other adjustments (partly for the probable underreporting of profits and partly for other revaluation items still included), some of which may be in a direction opposite to the correction for inventory profits. It therefore seemed preferable not to attempt, in an unsatisfactory and incomplete way, a partial adjustment which might increase the error rather than reduce it. We realize, however, that a thorough reworking of the figures for corporate saving and dissaving, consistently eliminating all revaluation items, is one of the major prerequisites for satisfactory estimates of total national saving.

c) Realized capital gains and losses likewise must be regarded as revaluation items to be excluded from current income.²⁷ Since saving has been defined for the purposes of this study as that part of current income which is not spent on consumption goods and services, the results of all revaluations of assets or liabilities

²⁶ These inventory profits or losses consist of two items. (1) the difference between the cost and the balance sheet valuation of inventories held at the beginning and the end of the period of measurement, (2) the difference between the book value and the market price at the time of consumption of inventories consumed during the period of measurement in the process of production. See Simon Kuznets, *Volume One*, p. 165.

On the practical problems of eliminating inventory profits and losses, see *ibid.*, pp. 145-56 and 165-72.

²⁷ Unrealized capital gains and losses should, of course, always be excluded from current income and from earned surplus. For discussion of the problem of the treatment of capital gains and losses in estimates of national income, see *Volume One*: M. A. Copeland, Part One, pp. 19, 20, 30-32, discussion by Simon Kuznets and Dr. Copeland's reply; Clark Warburton, Part Two, pp. 97-101; Simon Kuznets, Part Four, discussion by M. A. Copeland, Milton Friedman, and A. W. Marget, and Dr. Kuznets' reply; and *Volume Two*: Roy Blough and W. W. Hewett, Part Four, discussion by M. A. Copeland, H. M. Groves, Simon Kuznets, George O. May, and H. C. Simons, and the reply by Blough and Hewett.

as well as realized and unrealized capital gains and losses, in theory, do not enter into the calculation of saving or dissaving.²⁸

Using the income account method it is possible, though difficult in practice, to eliminate revaluations and capital gains and losses by properly adjusting the available basic data, which often include such transactions among current income.²⁹ In the overall balance sheet method elimination of revaluation items and capital gains and losses is achieved automatically if care is taken not to include revaluation items among changes in assets and liabilities.³⁰

²⁸ Write-downs occasionally constitute only an acknowledgment of regular depreciation or obsolescence formerly omitted from the accounts; likewise some write-ups represent merely the cancellation of excessive depreciation allowances of the past. See Fabricant, *Volume One*, pp. 133-134. While such revaluations may, to some extent, be regarded as forming part of the current income account, it seems preferable to omit them, together with all other revaluation items, from both income and saving.

²⁹ In the estimate of saving made by the Brookings Institution capital gains and losses were included in income and in saving, but separate figures were shown so that an adjustment is possible. Dickinson and Eakin include 'advances in values due to price changes' (which they take from the Brookings estimates) in their calculated change in the national net worth but show them also as a separate item (*A Balance Sheet*, p. 29).

³⁰ Capital gains and losses on securities, constituting the great bulk of all capital gains and losses, will never appear directly in the saving subtotal 'net absorption of securities', because absorption is calculated as the difference between the gross proceeds from the issue of new securities minus payments received by investors for securities matured or retired, adjusted for the net purchase or sales balance on account of security transactions by foreigners and for changes in borrowing on securities. This series is obviously unaffected (except for the relatively minor amount of gains or losses on international transactions) by transactions in already outstanding securities, the type of transaction giving rise to capital gains or losses.

However, realized capital gains (or losses), if not spent (or offset by increased saving) during the period of measurement, may appear at the end of the period as an increase (or decrease) in certain assets or liabilities other than securities of the individual making (or suffering) gains (or losses). But, and this is the essential point, such a change in the assets or liabilities of the recipient of capital gains or losses is balanced in the overall statistics by an opposite change in the assets or liabilities of other economic units. Assuming that both purchase and sale occur within the period of measurement and that capital gains or losses are retained in the form in which they are originally made, e.g., in cash, an increase (decrease) in the cash holdings of the gainer (loser) will be offset by a decrease (increase) in the cash balance of the other party to the transaction or an increase (decrease) in his borrowing on securities. In either case, the aggregate figures quite correctly show no saving. Where one of the parties is a foreigner,

3 DEPRECIATION

The treatment of depreciation allowances, which constitute the difference between gross and net saving, raises no problems not already discussed in connection with the estimation of national income.⁸¹ These problems are connected mainly with (1) the determination of the useful life of durable assets, (2) the method of distributing total depreciation charges on a durable asset over its entire useful life, (3) the question whether depreciation charges should be based on the original or the replacement cost of durable assets.

For this study the depreciation charges as entered in the books of corporations have provisionally been accepted as adequate reflections of the depreciation accruing on the durable assets of corporations. There is probably little objection to this treatment so far as the determination of the useful life of durable assets and the distribution of depreciation allowances over it are concerned. Accounting practices are anything but consistent and vary from firm to firm and year to year, but we possess neither an economic theory of depreciation sufficiently consistent or of sufficiently general acceptance to justify a systematic correction of the figures entered in the books of corporations, nor would it be possible to carry through such an adjustment in practice.

The relative merits of original or replacement cost as the basis for depreciation allowances are still subject to controversy. Depreciation allowances are, in fact, based on a conglomeration of pure historical cost, historical cost affected by revaluation, replacement cost, and arbitrary values, with historical cost probably prevailing to an extent not exactly determinable. Strict

the offsetting item is absent and a saving (dissaving) is shown, again as it should be.

The psychological effect of capital gains (or losses), whether realized or not, may nevertheless affect consumption expenditure. An increase in wealth which appears as a windfall rather than as a result of saving out of ordinary income is likely to result in increased consumption expenditure, particularly when the gain is realized. The resulting increase in expenditures has repercussions which may and probably will affect income and saving as compared to the level that would have existed had there been no capital gain. Such indirect effects will be reflected in the statistics as they should be, but the capital gain, as such, will not be.

⁸¹ See particularly *Volume One*, Parts One, Three and Four.

adherence to the principle of replacement cost would in any case be extremely difficult since assets written off or abandoned generally are not replaced by physically identical pieces of property, a fact which makes it almost impossible to determine actual replacement costs. Adjustment of depreciation allowances, which are based on cost, by an index of prices of machinery and equipment, therefore, does not solve the problem. It so happens that for the period covered by this study the difference between depreciation based on cost and on replacement values is, apparently, numerically small.³² These theoretical and practical reasons have induced us not to make any adjustments in the reported depreciation allowances of corporations.

The depreciation allowances on the durable assets held by individuals, farm enterprises, and government organizations had to be estimated for the purpose of this study. The data on the value of the durable assets to be depreciated are subject to such a wide margin of error and the assumptions that had to be made with respect to the useful life of the different types of such assets so rough that it seems inadvisable at present to consider a refinement such as an adjustment for the difference between replacement value and cost.

4 DEMARCATION OF CURRENT EXPENSES

The demarcation of the types of expenses to be regarded as current, which by exclusion determines capital expenses, is necessarily somewhat arbitrary. For this study it has been decided to include expenses on durable consumers' goods, as well as those on durable goods used by business and government, as 'capital expenses'.³³ Durable consumers' goods have been defined so as to include not only houses, but also automobiles and certain other types of consumers' goods that ordinarily have a life of more than a year, namely, furniture and household machinery and equipment. Expenditures on some types of consumers' goods that would ordinarily last more than a year have thus been included among current expenses. A fine segregation in the field of these minor durable consumers' goods, however, is of little importance for the statistical results.

³² See *Volume One*, p. 129.

³³ 'Capital expenses' include also the cost of services associated with the saving process, such as the cost of distributing new securities.

5 TREATMENT OF INTERNATIONAL TRANSACTIONS

The object of measurement is the combined change in the earned surplus of all residents of the United States. The material is such that for both the income account and the balance sheet measurements certain adjustments have to be made in the figures to eliminate changes attributable to persons residing outside the United States.

Where the income account measurement is used, i.e., for government units and business corporations, adjustment is necessary only so far as part of the net saving or dissaving reflected in a change in the earned surplus must be imputed to foreigners on the basis of their ownership of a certain proportion of the equity. Since foreigners, over the period covered by this study, probably owned not more than about 3 per cent of the total equity in all domestic corporations,³⁴ the error committed by not segregating the corresponding share of foreigners in the change in the earned surplus of domestic corporations is necessarily very small. This omission, moreover, may be either compensated for or aggravated by the failure to make separate allowance for the equity of Americans in changes in the undistributed earned surplus of foreign corporations (other than consolidated subsidiaries).

Where changes in certain items of assets and liabilities have been used in measuring saving (i.e., in the case of individuals and farmers) the portions attributable to individuals residing outside the United States must be deducted in each instance. This has been done, although but roughly, for bank deposits and securities held by foreigners and for foreigners' equity in insurance contracts with American companies.³⁵ The impossibility of making similar adjustments for other items of assets and liabilities, e.g., individuals' equity in building and loan associations, is probably of no practical importance. Not enough information is

³⁴ Total capital stock and surplus of all corporations submitting balance sheets to the Treasury amounted to about \$110 billion in 1935, while the value of all foreign investments in domestic corporate stock may be estimated on the basis of Department of Commerce figures to have fluctuated between about \$3 and \$5 billion from 1934 to 1937. See the *Balance of International Payments of the U. S. in 1937*, p. 64.

³⁵ The residual credit in the balance of international payments suggests that present statistics understate foreigners' acquisitions of cash and securities.

available to make it possible to adjust for the changes in the deposits of American individual investors with foreign banks and in their equity in contracts with foreign life insurance companies; both items, however, may be assumed to have been very small.³⁶

6 DUPLICATIONS

The method of measuring saving employed in this study, it is claimed, excludes all duplications that have so beset attempts to measure saving by the balance sheet method. Duplications are theoretically avoided under this method because changes in the earned surplus (exclusive of revaluation items) of different economic units are independent of one another in the sense that an increase or decrease in the surplus of one unit is not reflected in a similar change in that of another unit. Changes in assets or in liabilities that are not reflected in a change in the earned surplus of an economic unit do not in principle enter into the calculations and therefore cannot give rise to duplication.³⁷

IV The Components of the Saving Estimates

1 COMPONENT SERIES

The following separate series, described in more detail in the Appendix, have been used in estimating national saving:

1. Saving of individuals
 - a) Change in individuals' holdings of currency and deposits in banks and Postal Savings System
 - b) Change in individuals' equity in building and loan associations

³⁶ A minor problem is raised by the treatment of the capital brought in by immigrants or removed by persons transferring their residence abroad. The figures used in this study always include assets and liabilities of all persons residing within the United States. Annual changes, therefore, include items that reflect the funds brought in by immigrants or removed by emigrants and belong to the capital account rather than to the current income account. There is no possibility at present of estimating these items or of distributing them among the different forms of assets and liabilities of individuals.

³⁷ In applying the principle, however, there is a possibility of duplications because it is not feasible to compute the changes in earned surplus for each unit individually. In practice the change in earned surplus of individuals is computed for them as a group from the changes in their assets and liabilities.

- c) Change in individuals' equity in insurance and pension contracts (measured by the total assets less borrowings and policy loans of insurance companies; includes Social Security funds ³⁸ and state and municipal trust funds)
 - d) Change in individuals' equity in securities (measured by deducting from the new issues sold for cash, retirements at or before maturity, and adjusting for net purchases or sales by foreigners and by domestic institutions and for changes in individuals' borrowings on securities)
 - e) Change in individuals' equity in houses (measured by the value of construction of one to four family urban houses minus depreciation and adjustment for changes in residential mortgage debt outstanding and for loss of residences to non-individuals through foreclosure)
 - f) Change in individuals' equity in passenger cars (measured by the value of domestic retail sales minus depreciation and adjusted for changes in instalment debt outstanding)
 - g) Change in individuals' equity in other durable consumers' goods, mainly furniture and household machinery (measured as in Item (f))
2. Business saving
- a) Corporate saving (net earnings, adjusted for capital gains and losses, minus cash dividends paid)
 - b) Business saving of farmers (measured by the value of farm construction, the sale value of farm machinery and the investment in livestock minus depreciation on farm buildings and equipment, adjusted for changes in farm indebtedness and loss of farms to non-individuals through foreclosure) ³⁹
3. Government saving
- a) Federal government (measured by the difference between current receipts and current expenditures, i.e., excluding capital outlays, minus depreciation on government property)
 - b) States and territorial subdivisions (measured, in principle, in the same way as for the federal government).

2 SOURCES AND CHARACTER OF DATA

The sources from which the figures were derived are described in detail in the Appendix. It may suffice here to mention briefly the main sources of the material utilized in our calculations. Most

³⁸ See the discussion by Dr. Dulles and Dr. Colm regarding the assignment of growth of Social Security funds to individual saving and our reply.

³⁹ Saving by farmers in other forms is included with individuals' saving

of the series used in estimating saving of individuals have been derived from the usual financial and production statistics, although adjustments have often been necessary to make the data conform as closely as possible to the concepts used. However, one of the main series, the change in individuals' equity in securities, is based to a large extent on newly assembled data.⁴⁰

For corporate saving our estimates are based on the *Statistics of Income* of the Treasury Department. There is reason to believe that they understate the actual amount of corporate saving because of the tendency to report to the Treasury Department as unfavorable a picture of net income as is compatible with the law.⁴¹ Inventory profits and losses, bad debts, and write-ups and write-downs, other than gains and losses realized on the sale of capital assets, have not been eliminated.

The data for saving of the federal government have been derived from various statements of income and expenditure by the Treasury Department. They are very tentative because the Treasury Department fails to separate in its accounts current and capital expenditures.⁴²

The estimate for state and local governments is still rougher. It is based chiefly on published estimates by the National Industrial Conference Board and the Twentieth Century Fund and on estimates of non-federal public construction by the Department of Commerce.

3 DEFICIENCIES OF MATERIAL

It is realized that almost every one of the numerous series from which the estimates have been built up can well stand refinement and improvement. In several cases the changes to be expected will be small enough in size and diverse enough in direction to be without appreciable effect on main subtotals or grand totals. In others, however, the corrections are likely to be in a definite

⁴⁰ *Selected Statistics on Securities and on Exchange Markets* (Securities and Exchange Commission, August 1939), Parts I and II.

⁴¹ J. F. Ebersole, S. S. Burr, and G. M. Peterson found that for 104 industrial corporations net income for 1923 through 1926 in returns to the Treasury averaged about 12 per cent below that in published reports ('Income Forecasting by the use of *Statistics of Income Data*', *Review of Economic Statistics*, XI (1929), 178).

⁴² However, our figures agree fairly well, for the period as a whole, with the rough estimates presented in the President's budget message of January 4, 1939

direction year after year and to be sufficiently large to alter materially at least some of the major components of the aggregate.

The series used in preparing the estimates are of very different completeness and reliability. Probably the widest margin of error exists in the tentative figures developed to measure the saving of the various government units. A considerable and probably systematic error also affects the estimates for business saving. Of the series measuring individual saving, the figures for saving in the form of durable consumers' goods other than houses and automobiles are little more than guesses. Of the other series, those for individual saving through cash and bank deposits and through insurance are probably subject to the relatively smallest amount of error.

The most important improvements in the statistical material needed in order to obtain fairly reliable estimates of total saving and its components by the method adopted in this study are listed below.

a) Estimates for the net construction and equipment expenditures and net changes in inventories of unincorporated enterprises other than farms—items now simply omitted because of lack of material

b) A new series for corporate saving, eliminating both the understatement inherent in the use of uncorrected Treasury figures and the write-ups and write-downs and other revaluation items now included

c) A new, or rather the first, comprehensive estimate of the saving of government units

d) Estimates of changes in the equity of individuals in buildings other than one to four family houses—omitted because of lack of data

e) An improved estimate of changes in individuals' equity in durable consumers' goods other than houses and automobiles, particularly of changes in consumers' indebtedness

f) Information on the purchase and sale of non-tax-exempt securities by non-financial corporations and data on individuals' borrowing on securities (now lumped with similar borrowing by corporations), both series necessary for an adequate calculation of individuals' equity in securities

g) Information on other forms of indebtedness of individuals and unincorporated businesses to corporations and government units ⁴⁸

⁴⁸ Samples of detailed balance sheets of individuals on various income levels, particularly in the upper levels—an item rightly stressed by Dr Hart in Discussion IV—would go far to fill the gaps indicated under (d), (e), and (g).

h) Information on the composition of the persistent residual credit in the balance of international payments. This credit is believed to represent unreported acquisitions of cash or securities by foreigners. Failure to report such acquisitions leads to an overstatement of increases in domestic holdings and therefore to an overstatement of saving

*V The Total Volume and Components of Saving,
1933-1937*

1 TOTAL NET SAVING

Our estimates of saving, defined as the change in the aggregate earned surplus of all household, business, and government units in the United States, for 1933-37, and rounded to the nearest half billion dollars, are as follows (the negative items represent, of course, dissaving, estimates are in billions of dollars):

1933	—\$6.0	}	—\$12.5
1934	— 4.5		
1935	— 2 0		
1936	4.5	}	\$10.0
1937	5.5		

The main series making up these totals are summarized in Table 1. Sources and methods of calculation are described in the Appendix. These figures are very tentative and somewhat incomplete (see Sec. IV, 3 above). It is as yet impossible in calculations of this type to achieve a high degree of accuracy, the more so since there is no assurance that the errors in some series will be compensated by errors in the opposite direction in others. Rounding off the figures to the nearest half billion, or to the nearest one hundred million as in Table 1, serves to emphasize the approximate nature of all the figures and to avoid too unjustified an appearance of precision.

It is likely that these preliminary estimates for total saving somewhat understate the amount of saving, mainly because of the underestimation of corporate saving, the omission of net in-

They would also provide a check on many other estimates and make it possible to analyze the relation between income and changes in certain assets and liabilities

vestment in plant and inventory by unincorporated business, and the omission of an apparent decrease in certain types of floating debts of individuals owed to corporations and government units. On the other hand, saving by state and local governments is probably overstated somewhat because of the incompleteness of certain depreciation charges.

TABLE 1
NET SAVING IN THE UNITED STATES

(billions of dollars)

	1933	1934	1935	1936	1937	1933-37
<i>Individual saving</i>						
In Liquid Form						
Currency and deposits	-1.2	+2.5	+2.6	+3.9	+0.5	+8.3
Bldg and Loan associations	-0.6	-0.3	-0.4	-0.2	-0.1	-1.6
Insurance and pension reserves	+0.5	+1.4	+1.9	+2.7	+2.9	+9.4
Through absorption of securities	+0.5	-1.0	-2.3	+0.1	+0.6	-2.1
In Durable Consumers' Goods						
Non-farm dwellings	-0.3	-1.7	-0.8	0.0	-0.2	-3.0
Automobiles	-0.7	-0.4	+0.2	+0.3	+0.7	+0.1
Other	-1.0	-0.5	-0.3	+0.6	+1.0	-0.2
Total	-2.8	0.0	+0.9	+7.4	+5.4	+10.9
<i>Business saving</i>						
Agriculture	-0.2	-0.4	-0.1	+0.2	+0.2	-0.3
Corporate	-3.1	-2.5	-1.5	-1.2	-0.9	-9.2
<i>Government saving</i>						
State and Local	+0.5	+0.5	+0.6	+1.1	+1.4	+4.1
Federal	-0.5	-2.0	-2.0	-2.8	-0.5	-7.8
Total national saving	-6.1	-4.4	-2.1	+4.7	+5.6	-2.3

In evaluating these figures for total net saving in the United States, it is important to remember that the same absolute amount of saving or dissaving may mean quite different things for the economic process as a whole depending on how it is made up. There is, first, a considerable difference between saving in the form of repayment of indebtedness or of hoarding, which interrupts the flow of income, and saving of equal magnitude that reflects the acquisition of newly produced assets. Thus the type of assets in which saving appears is of considerable importance. The same addition to assets ordinarily will lead to a more precarious situation when it makes its appearance in the form of an addition

to inventories than when it takes the form of new durable goods. Among durable goods, again, saving in the form of durable owner-operated consumers' goods is likely to lead to shorter disturbances in the existing price and production structure than saving that reflects additions to the stock of durable producers' goods. Aside from the type of the new assets, the method of financing also makes a considerable difference. An increase in stockholders' equity usually raises fewer financial problems than a similar increase that finds its counterpart in an addition to the debt structure. Finally, the same amount of net saving means something quite different if it is a result of large gross saving and large depreciation allowances than if both are small; a larger production of durable goods is implied in the first case than in the second.⁴⁴

2 COMPONENTS OF NET SAVING, 1933-1937

At least as much importance and interest attaches to the data on the components of saving as to the estimates of aggregate saving discussed in the preceding section. As a matter of fact, methods like those used in this study provide the only way of obtaining information on changes in the structure of the saving process; the proportion of national income saved could as easily be estimated from statistics of the volume of investment.

a) *Individual, business, and government saving*

The first striking fact that emerges from any quantitative analysis of the saving process from 1933 to 1937 is the predominance of individual saving. In these five years individual saving is estimated to have aggregated about \$11 billion while business and government units showed dissaving of about \$9.5 and \$4 billion

⁴⁴ These distinctions apply with considerable force to a comparison between the situation in 1936-37 and the late 'twenties. In 1936-37 a not inconsiderable part of net saving reflected repayment of indebtedness, particularly of residential mortgage debt and borrowings on securities. Cash and bank deposits among the increase in assets of individuals, and inventories of raw materials and finished goods among the increase in assets of business enterprises, were apparently much more important, both absolutely and relatively, than in the late 'twenties. On the other hand, the much higher ratio of gross to net saving in 1936-37 meant that the same amount of net saving reflected larger expenditures on durable goods, and thus a larger effect on the economic system than a decade earlier.

respectively.⁴⁵ In 1933 and 1934 none of the three major groups showed net saving, the net dissaving of business being by far the largest item. In 1935 and 1936 individuals were the only major group with positive saving. Even in 1937, when the current income of government units seems to have exceeded their current expenses, individuals contributed by far the largest part of total national saving.⁴⁶

b) *Direct and indirect individual saving*

Closer analysis must distinguish two types of saving by individuals, which may be called direct and indirect net saving. Direct net saving (or dissaving) takes the form of a change in the equity of individuals in individually owned and operated durable consumers' goods. Indirect saving represents the acquisition by an individual of a money claim of determined amount (or the reduction of a debt of determined amount) or of a participation in the equity of a business enterprise.

For 1933-37 as a whole, direct individual net saving is estimated to have been negative to the extent of over \$3 billion, as new purchases of durable consumer goods by individuals were not sufficient to make up in full for the accruing depreciation on the existing stock of such goods and the increase in instalment debt. However, while there was considerable direct dissaving during 1933-35 new purchases exceeded depreciation and increase in instalment indebtedness by about \$2.5 billion in the two years 1936 and 1937 together. Individuals' equity in non-farm dwellings declined in every year; for automobiles and other durable consumers' goods the excess in 1936 and 1937 of new purchases over depreciation and increase in consumers' indebtedness was virtually sufficient to cancel the shortage that had persisted from 1933 to 1935.

⁴⁵ Corporate dissaving would probably be considerably smaller if more nearly correct figures could be calculated and might even be positive in a few years. This correction, however, would not invalidate the general statement that over the period as a whole business and government showed a net dissaving and that positive saving was restricted to individuals.

⁴⁶ It should be remembered that saving in the form of Social Security reserves and trust funds of government units is classified here as saving of individuals. If it were classified as government saving, these statements would still be correct, the preponderance of individual saving being materially reduced only in 1937.

c) *Structure of indirect individual saving*

A further breakdown of indirect individual saving, which constituted most of the nation's net saving over the last six years, is necessary to bring the relevant facts out adequately. There was but little individual saving through absorption of securities. As a matter of fact, over the period as a whole, individuals are estimated to have reduced their holdings of securities (abstracting from changes in the value of securities held) about \$3 billion.⁴⁷ Only in 1933, 1936, and 1937 did individuals spend more on the purchase of securities than they received from issuers for securities retired or from foreigners or financial institutions for securities bought from individuals in the open market. However, these relatively small purchase balances were more than compensated for by the large reduction in holdings in 1934 and 1935, to a great extent the result of foreign purchases of stocks and redemptions and institutional purchases of corporate bonds.

In the final analysis, then, individual saving was restricted exclusively to increase in (1) individuals' cash and bank deposits and (2) individuals' equity in insurance and pension contracts.⁴⁸ For the period as a whole, individual saving in the form of an increase of cash and bank deposits amounted to over \$8 billion while individuals' equity in insurance and pension contracts increased nearly \$9.5 billion. The average annual saving in these two main forms of indirect saving, therefore, amounted to over \$3.5 billion.⁴⁹

3 GROSS SAVING

Gross saving, the sum of net saving and depreciation allowances on producers' and consumers' goods, rose rapidly from about \$5.5 billion in 1933 to about \$18.5 billion in 1937. Our estimates of

⁴⁷ For calculation of this figure, see IV, 1

⁴⁸ In his discussion of this paper Dr Hart suggests that there may also have been a considerable repayment of indebtedness by individuals.

⁴⁹ Year to year fluctuations were considerable for individuals' cash and bank deposits. Saving in this liquid form was at a high level from 1934 through 1936, but fell sharply in 1937. Saving through the medium of private and government insurance institutions, on the other hand, grew steadily from not much over \$500 million in 1933 to well over \$2 billion in 1937. (But see footnote 46)

gross saving for each of the years 1933-37, again rounded to the nearest half billion dollars, are as follows (in billions of dollars):

1933	\$5.5
1934	7.5
1935	10.0
1936	17.0
1937	18.5

VI Comparison with other Estimates of Saving and Investment

1 NET SAVING

A direct check on our figures is provided by a comparison with the (as yet unpublished) estimate of saving of individuals in the year ended June 30, 1936, prepared by the National Resources Committee from material collected in connection with the Consumer Purchases Study. The expenditures on durable consumers' goods other than houses are not included in saving, and depreciation on consumers' durable goods is omitted throughout; otherwise, however, the definitions coincide fairly well with those adopted in our study. To make comparison possible an estimate has been prepared, by the methods used in our calendar year estimates, of individual saving for the year ended June 30, 1936. The estimate so derived, after eliminating net saving or dissaving in consumers' durable goods other than houses, coincides fairly closely with the calculations of the National Resources Committee, both indicating about \$6 billion (before depreciation on houses).⁵⁰

⁵⁰ Direct comparison of our estimates with those developed by Ezekiel, *op. cit.*, for each year 1918-35 by a method similar to that applied to 1914-29 data by Warburton, *op. cit.*, is not possible because Dr. Ezekiel's figures cover only saving by income tax payers (i.e., individuals with an annual net income of over \$1,000) and do not include the change in individuals' equity in automobiles and other durable consumers' goods.

Dr. Ezekiel's estimates are based on the income statistics of the Treasury Department and the ratios of saving to total income at different income levels as determined by the Brookings Institution for 1929. In fact, the estimates represent nothing but a weighted aggregate of the income of taxpayers in the different groups, the Brookings saving ratios being used as weights. The annual movement

The most important check upon our estimates of saving are the calculations of net investment, i.e., the value of expenditure on durable goods minus depreciation, adjusted for changes in inventories not resulting from price changes and for the foreign balance.

Comparison is possible, first, with estimates of expenditures on durable goods prepared by Mr. Terborgh of the Division of Research and Statistics, Board of Governors of the Federal Reserve System.⁵¹ Since Mr. Terborgh's figures do not include the value of changes in inventories or in the foreign balance, these two items must be added to his figure to make them comparable with our estimates of saving. The estimates indicate net aggregate disinvestment and dissaving respectively of about \$8 and \$12.5 billion for 1933-35, and positive aggregate investment and saving of about \$13 and \$10 billion, respectively, for 1936 and 1937. Most of the discrepancy occurs in 1935 and 1937, when estimated saving is considerably below calculated net investment.⁵²

The differences are considerably larger between the estimates of saving presented in this paper and the figures for net investment (excluding durable consumers' goods other than houses) calculated by Kuznets.⁵³ Kuznets' estimates for net investment

of the estimates therefore reflects only the changes in the income structure of individual taxpayers and does not allow for changes in the propensity to save for incomes of equal size, which may well be of considerable importance. See W. L. Crum, 'Individual Shares in the National Income', *Review of Economic Statistics*, XVII (November 1935), 116-30, E. W. Gilboy, 'The Propensity to Consume', *Quarterly Journal of Economics*, LIII (November 1938), 120-40.

Although Dr. Ezekiel's estimates cover the saving of only part of the population, his absolute figures for 1933-35 are considerably higher than those presented in this paper. This is probably due mainly to two factors (1) his estimates include capital gains which were particularly large in 1929, the base year for the saving ratios used throughout, (2) they exclude individuals with a net income of under \$1,000, who, as is known from other sources, are responsible for a considerable amount of dissaving.

⁵¹ The figures for net expenditures on durable goods in 1929 prices have been kindly supplied by Mr. Terborgh.

⁵² Virtually the same figures are used in estimating individuals' equity in durable consumers' goods, the difference being only the adjustment for changes in installment debt outstanding which is made in the saving estimate.

⁵³ 'Commodity Flow and Capital Formation in the Recent Recovery and Decline, 1932-1938', *Bulletin 74*, National Bureau of Economic Research (June 25, 1939), p. 2.

are higher throughout than our figures for net saving (excluding net saving reflected in purchases and depreciation of durable consumers' goods other than houses). For 1933-35 net investment according to Kuznets was negative to the extent of over \$4 billion while our figures show net dissaving of about \$10 billion. For 1936 and 1937 estimated net saving of less than \$8 billion compared with calculated net investment of over \$13.5 billion.⁵⁴

Both comparisons suffer because: (1) the estimates of saving imply a book value measurement of changes in inventories whereas in the estimates of capital formation the change in inventories is adjusted for price changes; (2) the estimates of saving omit the change in non-corporate inventories whereas the estimates of capital formation include the change in inventories of all business enterprises; (3) the estimates of capital formation apparently include certain commodities, the purchase of which is often regarded as a current expense in the books of business corporations. Had it been possible to adjust the saving figures for revaluation of corporate inventories and also to include the value of changes in non-corporate inventories, dissaving (and therefore the discrepancy between the estimates of saving and investment) would probably have been greater in 1933 and 1934 than is indicated above. In 1935 and particularly 1937, and probably also in 1936, positive saving would have been greater, however, and the discrepancy would have been less.

2 GROSS SAVING

Our estimates of gross saving for each of the years 1933 to 1937, together with the estimates of gross investment by Kuznets and Terborgh, are shown in the table below to the nearest half billion dollars. This comparison is affected by the differences just mentioned in the preceding section.

⁵⁴ Let none assume that any difference as shown here between the estimates of saving and those of investment measures the divergence between saving and investment during a given period. Both sets of figures are undoubtedly still affected with a margin of error so large that differences of the order of magnitude indicated here may be nothing but the result of the imperfections of one or both sets of estimates. They are certainly not able to disprove the theoretically demonstrated equality of investment and saving measured *a posteriori* for any period.

	GROSS INVESTMENT ¹		
	ESTIMATED GROSS SAVING ¹	KUZNETS' ESTIMATE	BASED ON TERBORGH'S
			ESTIMATE ²
1933	\$ 5½	\$ 7½	\$ 6½
1934	7½	10	9
1935	10	15	14
1936	17½	21	19½
1937	18½	25	23

¹ Including consumers' durable commodities

² To Terborgh's figures have been added the additions or reductions in inventories (according to the estimates of Kuznets) and the foreign balance on current account to make the figures comparable with those in the other two columns.

APPENDIX: STATISTICAL SOURCES AND METHODS

Sections I–VII of the Appendix relate to individuals' saving,⁵⁵ Sections VIII and IX to business saving, and Sections X and XI to government saving.

I Change in Currency and Deposits in Banks and Postal Savings System held by Individuals (Table I)

In order to develop a series for the cash holdings of individuals it is necessary to prepare two main subtotals: first, total volume of currency, and bank and Postal Savings deposits in the hands of the public; second, the amount of such cash held by foreigners and by domestic non-individuals. The second subtotal must be subtracted from the first in order to arrive at an estimate of currency and deposit holdings of domestic individuals.

1. *Total currency outside banks and U. S. Treasury.* Obtained from the Division of Research and Statistics, Board of Governors of the Federal Reserve System. It is based on a calculation of total money in circulation outside the Treasury and the Federal Reserve banks and figures for currency in the hands of banks, reported by the Comptroller of the Currency for all banks on June 30 and by the Federal Deposit Insurance Corporation for insured banks on December 31 of 1934 and succeeding years.

⁵⁵ Throughout this study the term 'individual' is used to include unincorporated businesses (other than farms), trust funds, and non-profit-making institutions such as churches and universities.

TABLE I
CHANGE IN INDIVIDUALS' HOLDINGS OF CURRENCY AND DEPOSITS
IN BANKS AND POSTAL SAVINGS SYSTEM

(millions of dollars)

	YEARS ENDING DECEMBER 31					
	1932	1933	1934	1935	1936	1937
1 Total currency outside banks and U. S. Treasury	4,710	4,800	4,670	4,940	5,550	5,690
2 All bank deposits, excl. inter-bank deposits	41,780	38,651	44,679	48,724	53,420	52,318
3 Deposits in Postal Savings System	902	1,209	1,207	1,201	1,260	1,270
4 Deposits of Postal Savings System in banks	793	914	540	287	145	130
5 Items in process of collection by banks	1,180	1,176	1,949	2,313	2,604	2,326
6 Total currency and deposits, adj. (1+2+3-4-5)	45,419	42,570	48,067	52,265	57,481	56,822
7 Currency and deposits of non-financial corp.	6,431	6,131	6,395	6,828	7,607	6,922
8 Currency and deposits of financial corp excl. banks	1,698	1,659	2,357	3,035	2,908	2,472
9 U. S. Gov. deposits in commercial banks	500	1,000	1,687	881	947	801
10 Deposits of other public bodies	1,826	2,026	2,601	3,079	3,263	3,256
11 Deposits of foreigners	715	390	496	1,056	1,325	1,437
12 Deposits of foreign banks with Federal Reserve banks	19	4	19	29	99	172
13 Deposits of foreign banks with U. S. commercial banks	248	136	156	453	442	466
14 Total deductions (7+8+9+10+11-12-13)	10,903	11,066	13,361	14,397	15,509	14,250
15 Currency and deposits of domestic individuals in open domestic banks and Postal Savings System (6-14)	34,516	31,504	34,706	37,868	41,972	42,572
16 Annual change		-3,012	+3,202	+3,162	+4,104	+600
17 Change in U. S. currency held abroad		-90	-26		+22	
18 Change in individuals' deposits in closed banks		+1,690	-770	-530	-145	-85
19 Change in currency and deposits of domestic individuals (16-17+18)		-1,232	+2,458	+2,632	+3,937	+515

2. *All bank deposits excluding inter-bank deposits.* A revision of figures appearing in the *Federal Reserve Bulletin*, also obtained from the Division of Research and Statistics, Board of Governors of the Federal Reserve System. It does not include deposit liabilities of Federal Reserve banks (which consist only of deposits held by domestic or foreign banks and the U. S. Treasury) but does include those of the major private banks.

3. *Deposits in Postal Savings System.* Taken from the *Federal Reserve Bulletin*.

4. *Deposits of Postal Savings System in banks.* Also taken from the *Federal Reserve Bulletin*. In order to avoid duplication it must be deducted from total deposits of banks.

5. *Items in process of collection by banks.* In order to avoid duplication this figure must be deducted from the reported total of deposits because items in the process of collection are included in the deposits reported by the banks of both the payor and the payee. The figures were obtained from the Division of Research and Statistics, Board of Governors of the Federal Reserve System; they are a few million dollars higher than the published figures for insured banks only. The reported data are known to be too low because some banks report their collection items under the heading 'due from banks'.

6. *Total currency and deposits, adjusted.* Sum of items 1, 2, and 3, less items 4 and 5. It is the first main subtotal referred to in the opening paragraph of this section.

7. *Currency and deposits of non-financial corporations.* The primary source for this estimate for 1932-36 is *Statistics of Income*, published by the Bureau of Internal Revenue. This volume contains the total cash reported by corporations submitting balance sheets with their income tax returns. Figures for these corporations are raised slightly to cover all corporations. The figure for 1937 was derived by reducing the 1936 figure 9 per cent. This percentage represents the change in cash held by 385 corporations as reported by the Standard Statistics Company. The estimate should be regarded as preliminary and subject to considerable revision.

8. *Currency and deposits of financial corporations other than*

banks. For 1932-36 the figure for financial corporations submitting balance sheets, other than banks, was made available by the Bureau of Internal Revenue. Deposits of mutual life insurance companies and building and loan associations are included. The figure for 1937 was assumed to be 15 per cent less than in 1936, the same as the percentage decline in the cash holdings of 49 life insurance companies reported in the annual proceedings of the Association of Life Insurance Presidents. The estimate is also subject to revision, which may be drastic, when *Statistics of Income for 1937* is published.

9. *U. S. Government deposits in domestic commercial banks.* For 1934-37, taken from the Federal Deposit Insurance Corporation call reports for insured banks. For 1932 and 1933 estimates were made from reports for member banks by multiplying these figures by the ratio between U. S. Government deposits in insured banks and in member banks in 1934-37.

10. *Deposits of other public bodies.* Obtained in same manner as item 9. The duplication referred to in the explanation of item 5 is also involved in item 10 because these figures were taken from bank statements. The outstanding checks of state and local governments are large but neither their size nor the change therein can be estimated. The debits of state and local government were reported only beginning with the week ended February 8, 1939, when they amounted to \$360 million.

11. *Deposits of foreigners.* Figures for year-ends beginning with 1932 taken from *The Balance of International Payments of the United States for 1937*, Table 36, p. 87.

12. *Deposits of foreign banks with Federal Reserve banks.* This item, which appears in the statement of the condition of Federal Reserve banks, must be added to total deposits because item 11, which is to be deducted, includes foreigners' deposits with Federal Reserve banks, whereas the total deposits from which the deduction is to be made do not. In Table I this addition is performed by deducting the item from the deductions.

13. *Deposits of foreign banks with U. S. commercial banks.* Based on Federal Reserve Board and Federal Deposit Insurance Corporation reports for member and insured banks. This item

must also be added back to total deposits because it represents inter-bank deposits, not included in item 6 but included in item 11.

14. *Total deductions.* Sum of items 7–11, minus items 12 and 13. It is the second main subtotal referred to in the opening paragraph of this section.

15. *Currency outside banks, U. S. Treasury, and corporations and deposits of domestic individuals in open domestic banks and in Postal Savings System.* Item 6 minus item 14.

16. *Annual change in item 15.*

17. *Annual change in U. S. currency held abroad.* Net receipts from abroad, shown as a negative figure in Table I, must be added to the annual changes in item 4, and net shipments must be deducted since they constitute changes in the domestic stock of cash which would otherwise not appear in the total. The figures, the reliability of which is rather doubtful, were taken from *The Balance of International Payments of the United States*.

18. *Change in individuals' deposits in closed banks.* The estimated annual change in individuals' deposits in closed banks must be added to item 16, since closed banks were not included in the above figures. The deposits of banks closed during a given year are included in total deposits at the end of the preceding year but not in total deposits at the end of the given year.

The basic material for these estimates (Table I–1) is not very satisfactory. The estimates were prepared by the authors, with the advice of experts of the Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation who, however, are not responsible for the figures. The footnotes to Table I–1 describe in detail the methods and the sources used in constructing the final figure.

19. *Change in currency and deposits held by domestic individuals.* Sum of items 16 and 18 minus item 17.

Changes in the holdings of foreign currency and deposits of individual Americans in foreign banks should be added in computing the final total, but there is no direct information concerning such changes, and the data now available are insufficient to make an estimate possible. It is believed, however, that non-individuals hold at least 95 per cent of the total deposits of Amer-

TABLE 1-1
CHANGE IN INDIVIDUALS' DEPOSITS IN CLOSED BANKS

	(millions of dollars)				
	1933	1934	1935	1936	1937
1 Deposits in banks closed during year ¹	3,599	37	10	11	20
2 Deposits in banks reopened ²	410	266	20	0	0
3 Dividends paid to unsecured creditors ³	775	872	747	220	140
4 Change in deposits in closed banks (1-2-3)	+2,414	-1,101	-757	-209	-120
5 Estimated change in individuals' deposits in closed banks ⁴	+1,690	-770	-530	-145	-85

¹ Figures for 1933 from *Annual Report*, Board of Governors, Federal Reserve System, 1936, p. 177; for 1934-37 from *Federal Reserve Bulletin* (1938), p. 510, 1933 figure excludes deposits in banks reopened between March 16 and June 30

² From Board of Governors, Federal Reserve System. The 1933 figure is for July to December only.

³ Years ending October 31. The figures, which include offset allowances, are estimated to be 280 per cent of the payments by national banks, reported for 1933-36 by the Comptroller of the Currency and estimated for 1937. The ratio of 280 per cent is based on figures for the cumulated deposits of suspended national and state banks

⁴ Estimated at 70 per cent of total deposits on basis of relationship in open banks

icans in foreign banks. The deposits of individuals in foreign banks may therefore be neglected, since they would vary only between \$5 and \$15 million at the maximum.

II Individuals' Equity in Building and Loan Associations (Table II)

In calculating individuals' saving through building and loan associations, no distinction need be made between the form such saving takes, namely, whether it is made in the form of purchase of shares or in the form of an increase in deposits. For this reason it can be measured from changes in the total assets of building and loan associations. It is necessary, however, to deduct from total assets the liability for funds contributed by non-individuals. So-called share-loans or pledged shares should also be deducted

TABLE II
CHANGE IN INDIVIDUALS' EQUITY IN BUILDING AND
LOAN ASSOCIATIONS

(millions of dollars)

		END OF YEAR					
		1932	1933	1934	1935	1936	1937
1	Total assets	7,750	6,978	6,451	5,889	5,742	5,712
2	Borrowed funds	280	272	209	183	205	239
3	Preferred stock owned by H O L C.	0	0	0	20	126	207
4	Preferred stock owned by U. S. Treasury	0	0	11	49	49	48
5	Pledged shares	1,100	900	700	500	400	350
6	Total deductions (2+3+4+5)	1,380	1,172	920	752	780	844
7	Net equity of individual shareholders (1-6)	6,370	5,806	5,531	5,137	4,962	4,868
8	Change in net equity of individual shareholders		-564	-275	-394	-175	-94

because they represent either unpaid balances due on shares or actual loans made to shareholders on the security of their shares. The situation is more truly reflected if the share account and the share loans are eliminated from both sides of the balance sheet.

The statistics of building and loan associations are unsatisfactory. The only comprehensive reports available up to 1936 are the annual compilations of the United States Building and Loan League, which do not make possible an adjustment for share loans. In recent years comprehensive and detailed statistics have become available for the federally chartered building and loan associations and for those participating in the Federal Home Loan Bank System. These associations, however, have less than one-third of the total assets of all associations. Any series for saving through building and loan associations must, therefore, be highly tentative. The following figures have been used:

1. *Total assets of building and loan associations.* From *Building and Loan Annals*, published by U. S. Building and Loan League.

2. *Borrowed funds.* Same source as item 1.

3. *Preferred stock owned by Home Owners' Loan Corporation.* Taken from the *Federal Home Loan Bank Review* and from the daily Treasury statement for the end of January, which

shows in detail the assets and liabilities of government corporations and credit agencies for year-ends.

4. *Preferred stock owned by U. S. Treasury.* The annual reports of the Federal Home Loan Bank Board give the government share subscriptions in member associations on December 31, 1935 and later years after deduction of Home Owners' Loan Corporation holdings. The remainder represents direct Treasury holdings which are confined to stock of federal associations. The figures for earlier years were obtained from the itemized statement of Treasury expenditures in the mid-month daily treasury statements.

5. *Pledged shares.* Figures for pledged shares are very incomplete, as may be seen from the discussion of the statistics in *Debts and Recovery*.⁵⁶ The figures in Table II for 1933 to 1936 are those used in that volume. The 1937 figure is our estimate, based upon the earlier years and discussions with experts at the Federal Home Loan Bank Board.

6. *Total deductions.* Sum of items 2-5.

7. *Net equity of individual shareholders.* Item 1 minus item 6.

8. *Change in net equity of individual shareholders.*

III Individuals' Equity in Insurance and Pension Reserves (Table III)

Saving through insurance, for the purposes of this study, is measured by the change in policyholders' net equity, i.e., total assets minus capital obtained from non-policyholders and minus policy loans and notes. This method lumps together changes in policyholders' and shareholders' equity. This, however, is not a drawback because most large life insurance companies and funds are mutuals in which there are no stockholders or members distinct from policyholders. The small undistributed net earnings of stock companies, which will appear in the figure for corporate saving (Sec. IX), have, however, been deducted in calculating the net equity of policyholders.

⁵⁶ A. G. Hart and the Committee on Debt Adjustment, *Debts and Recovery* (Twentieth Century Fund, 1938), pp. 76, 78, 80, 81, and 298.

TABLE III

INDIVIDUALS' EQUITY IN INSURANCE AND PENSION RESERVES

(millions of dollars)

	1932	1933	1934	1935	1936	1937
1 Legal Reserve Life Insurance Companies						
a Total assets	20,117	20,259	21,162	22,612	24,267	25,598
b Borrowings from RFC	60	63	53	36	33	30
c Loans to policyholders	3,730	3,710	3,510	3,380	3,250	3,230
d Net equity (a—b—c)	16,327	16,486	17,599	19,196	20,984	22,338
e Change in net equity		+159	+1,113	+1,597	+1,788	+1,354
f Corporate saving of stock companies		—29	—32	—23	—27	—33
g Change in net equity of policyholders (e—f)		+188	+1,145	+1,620	+1,815	+1,387
2 Fraternal Orders						
a Total reserves	680	794	822	850	888	924
b Loans	37	45	54	65	68	71
c Net equity (a—b)	643	749	768	785	820	853
d Change in net equity		+106	+19	+17	+35	+33
3 U S Gov Life Insurance Fund						
a Total reserves	559	615	665	724	789	850
b Loans	111	122	122	128	129	139
c Net equity (a—b)	448	493	543	596	660	711
d Change in net equity		+45	+50	+53	+64	+51
4 Social Security Funds						
a Total					64	1,138
b Change					+64	+1,074
5 Other Treasury Funds						
a Total	224	245	254	282	316	428
b Change		+21	+9	+28	+34	+112
6 Adj Service Certificate Fund, Change					+500	
7 State and Municipal Trust Funds, Change		+100	+200	+200	+200	+200
8 Total Change (1g+2d+3d+4b+5b+6+7)		+460	+1,423	+1,918	+2,712	+2,857

1 LEGAL RESERVE LIFE INSURANCE COMPANIES

a) *Total assets.* Derived from annual proceedings of the Association of Life Insurance Presidents. A downward adjustment of approximately 3 per cent, based on the ratio of reserves against foreign business to total reserves, was made to allow for the fact that some of the assets represent the equity of foreign policyholders.⁵⁷

b) *Borrowings from Reconstruction Finance Corporation.* Taken from R. F. C. reports and deducted from item (a). Small in amount, these borrowings are believed to constitute virtually the only funds obtained from other than policyholders.

c) *Policy loans and premium notes in the United States.* The figure for all companies, which must be deducted from item (a), was estimated from that for companies reported in the annual proceedings of the Association of Life Insurance Presidents. The published figures are based on about 50 companies holding fully 90 per cent of the assets of all legal reserve life insurance companies in the United States, and show separately that part of policy loans and premium notes emanating from the United States. The estimate was made by applying to these figures the ratio of total admitted assets of reporting companies to total admitted assets of all companies.

d) *Net equity.* This item, item (a) minus items (b) and (c), represents the net equity of shareholders and policyholders together.

⁵⁷ Changes in the equity of American policyholders in contracts with foreign life insurance companies should, on the other hand, be counted as a separate item of saving. In the absence of comprehensive information on the subject, no allowance for this item was made in the final figures.

The Sun Life Insurance Company of Canada reported its net liabilities, in millions of dollars, on United States business as follows

	END OF					
	1932	1933	1934	1935	1936	1937
Amount	167	173	190	208	231	252
Change		+6	+17	+18	+23	+21

The total assets of the Sun Life Insurance Company amount to about 40 per cent of those of all Canadian life insurance companies. No information is available on equity of American policyholders with other foreign life insurance companies but the amount and the changes in it may be assumed to be negligible.

e) *Change in net equity.*

f) *Corporate saving of stock companies.* Obtained from the Income Section, Department of Commerce.

g) *Change in policyholders' net equity.* Item (e) minus item (f). The deduction of item (f) eliminates the equity of shareholders in stock companies, leaving as a final figure the change in net equity of policyholders in stock and mutual companies.

2 FRATERNAL ORDERS

a) *Total certificate and contingent reserves.* Based on figures taken from *Statistics Fraternal Societies* of the Fraternal Monitor and from the *New York Insurance Reports, Volume IV*. The 1935-37 figures from the *Statistics Fraternal Societies* are considered all-inclusive. For prior years the ratio between the 1935 figure from this source and the corresponding figure in the *New York Insurance Reports* was applied to the 'other reserve' figures in the *New York Insurance Reports*. All the figures were, however, adjusted for reserves against liabilities to foreign members on the assumption that these were roughly equal to one-half the total liabilities to policyholders of Canadian companies included in the statistics. As the item is small, details of the adjustment are not important.

b) *Loans and liens to policy and certificate holders.* Estimated by multiplying the data published in *New York Insurance Reports, Volume IV*, by the ratio between total assets as given in *Statistics Fraternal Societies* and *New York Insurance Reports*. This estimate was then adjusted for loans and liens to foreigners on the assumption that half the total for foreign organizations represented loans and liens to foreigners. Figures for 1936 and 1937 are estimated from a sample of the largest fraternal orders.

c) *Net equity of individuals.* Item (a) minus item (b).

d) *Change in item (c).*

3 U. S. GOVERNMENT LIFE INSURANCE FUND

a) *Total reserves.* The 1932-36 figures appear in the annual report of the Administrator of Veterans' Affairs for 1937. The estimate for 1937 is based on the rate of change during preceding years.

b) *Policy loans*. The source for 1932-36 figures and the estimate for 1937 are the same as for total reserves.

c) *Net equity*. Item (a) minus item (b).

4 SOCIAL SECURITY FUNDS AND ACCOUNTS

This figure represents the change in investments of the Old Age Reserve Account and the Unemployment Trust Fund, as reported in the daily statement of the United States Treasury.

5 OTHER TREASURY FUNDS

Under this heading are included the Civil Service Retirement Fund, the Foreign Service Retirement Fund, the Canal Zone Retirement Fund, the Railroad Retirement Account, and the Alaska Railroad Retirement Fund. Figures are obtained in the same way as those for Social Security funds.

6 ADJUSTED SERVICE CERTIFICATE FUND

The certificates have been regarded as equivalent to annuity or life insurance contracts although veterans have not made any payments, the value of the certificates resulting purely from allocations of U. S. Treasury funds. The equity of individuals was therefore the difference between the estimated actuarial value of the adjusted service certificates prior to their redemption in 1936 and the loans made against them to veterans. Changes in this equity from year to year were negligible except in 1936, when the equity is estimated to have increased about \$500 million as a result of the premature payment of the face value. Estimates are based on figures appearing in the annual reports of the Administrator of Veterans' Affairs for maturity values of certificates and loans against them.

7 STATE AND MUNICIPAL TRUST FUNDS

Changes in assets were taken as representative of changes in equity of individuals in these funds. They were assumed to be about twice the figure for New York State trust funds plus the funds of cities having a population of 100,000 or over, as derived from various issues of *Financial Statistics of Cities* (Bureau of the Census, U. S. Department of Commerce). The 1937 figure is estimated on the assumption of a continuous growth.

IV Change in Individuals' Equity in Security Holdings
(Table IV)

To measure the saving of domestic individuals in the form of securities, it is necessary to calculate the net purchases (or sales) of securities by individuals and to deduct the increase (or add the decrease) in their borrowings against securities. In the absence of adequate figures bearing directly on transactions by

TABLE IV
CHANGE IN INDIVIDUALS' EQUITY IN SECURITIES

	<i>(millions of dollars)</i>				
	1933	1934	1935	1936	1937
1 Net change in securities outstanding ¹ (at cost value)	+1,374	+4,124	+1,317	+5,167	+3,044
2 Change in foreign holdings ²	+10	+80	+270	+655	+309
3 Change in holdings of domestic non-individuals ³	+1,164	+5,382	+3,376	+4,303	+2,556
4 Change in holdings of domestic individuals	+200	-1,338	-2,329	+209	+139
5 Change in borrowings of domestic individuals on securities ⁴	-366	-306	+28	+82	-463
6 Change in domestic individuals' equity in securities	+566	-1,032	-2,357	+127	+602
¹ From Table IV-1				³ From Table IV-5	
² From Table IV-4				⁴ From Table IV-6	

domestic individuals, their net purchases or sales must be determined indirectly. This is done by computing the joint net purchases or sales of securities by both individuals and institutions and by adjusting the result for the net purchases or sales of institutions and foreigners.

The figure for net purchases by individuals and institutions together is the sum of separate computations for different types of securities. Data on new security issues of the federal government and its agencies, and of the states and their territorial subdivisions, are directly available. But comprehensive information is lacking on retirements by states and their subdivisions. It is therefore preferable to base the calculation directly on the change in the amount of securities outstanding in the hands of the public. This change is known accurately for securities of the federal

government and its agencies. For state and municipal securities it has to be estimated rather crudely but even this estimate is preferable to a calculation of the difference between new issues and retirements because statistics on retirements are very unsatisfactory. On the other hand, net purchases or sales of corporate and foreign securities by individuals and institutions are computed by subtracting estimated retirements from new issues.

Changes in the value of securities outstanding do not enter into the computations because net sales and purchases are affected only by new and retired issues. This is as it should be, for such changes do not represent saving according to the definition used in this study.

Net purchases and sales of securities by domestic individuals are derived by subtracting from the difference between new issues and retirements the changes in the holdings of domestic institutional and foreign investors. To arrive at a figure representing the net purchase and sale balances of institutional investors (i.e., the money spent or realized from transactions in securities) it is necessary to eliminate from the changes in their holdings the effects of revaluations on securities held and of gains and losses on the sale of securities. To effect this correction an increase in holdings, reported in the balance sheets of institutions, is reduced by the amount of write-ups and capital gains or increased by the amount of write-downs and capital losses, while the opposite adjustments are made in the case of a decrease in the reported holdings.

The change in the equity of domestic individuals in securities, summarized in Table IV, is computed as follows:

1. *Net change in securities outstanding.* This figure, the computation of which is described in detail in Sec. 1-3 below, represents the gross receipts by issuers of securities less their expenditure for retirements, including in gross receipts the amounts received by underwriters and distributors. It therefore indicates the net amount spent on purchases or received from sales of securities by other than issuers.

2. *Change in foreign holdings.* This figure is the net purchase or sale balance of foreigners, taken from *The Balance of International Payments of the United States* (see Table IV-4). Bond redemptions and sinking fund payments to foreigners have to be

deducted. All such redemptions are included in our retirement figures but some of the securities retired were held abroad and must be added back. This addition is performed here by reducing the change in foreign holdings which must be deducted from 'net change in securities outstanding.' No adjustment for revaluation or capital gains or losses is necessary.

3. *Change in holdings of domestic non-individuals.* Computation explained in detail in Section 4 below.

4. *Change in holdings of domestic individuals.* Item 1 minus items 2 and 3.

5. *Change in domestic individuals' borrowings on securities.* This item, whose computation is explained in Section 5 below, represents the change in net liabilities of individuals to non-individuals on account of securities, and must be deducted from the change in holdings to get the change in individuals' equity.

6. *Change in individuals' equity.* This final item, used to measure domestic individuals' saving in the form of securities, is equal to item 4 minus item 5.

1 COMPUTATION OF NET CHANGE IN SECURITIES OUTSTANDING (TABLE IV-1)

This item is the total of changes in the following types of securities:

a) *U. S. Government direct obligations.* Measured by the annual change in direct interest-bearing obligations outstanding (including those held by Treasury funds and agencies) as shown by the daily statement of the U. S. Treasury, excluding bills and certificates of indebtedness with maturities of less than one year. Exchanges of bonds and notes for certificates of indebtedness of less than one year maturity are thus treated as cash offerings.

b) *U. S. Government guaranteed obligations.* Of a total United States guaranteed debt of \$4,644 million at the end of 1937, only \$726 million represents net cash sales, \$3,873 million being net issues exchanged for other securities, mortgages and loans, and the remaining \$45 million being net issues sold the U. S. Treasury (which, however, is included in the contingent debt of the United States). Exchange issues, as described above, together with retirements through like exchanges, have been excluded from Table IV-1. Data on the guaranteed debt are

TABLE IV-1
NET CHANGE IN SECURITIES OUTSTANDING
(millions of dollars)

	SALES FOR CASH (1)	RETIREMENTS (2)	NET CHANGE IN SECURITIES OUTSTANDING (3)
<i>1933</i>			
U. S. Gov. direct obligations			+2,006
U. S. Gov. guaranteed obligations			
State and local	520	874	-354
Corporate	515	683	-168
Foreign	70	180	-110
Total			+1,374
<i>1934</i>			
U. S. Gov. direct obligations			+4,178
U. S. Gov. guaranteed obligations			+511
State and local	939	1,396	-457
Corporate	715	713	+2
Foreign	10	120	-110
Total			+4,124
<i>1935</i>			
U. S. Gov. direct obligations			+1,202
U. S. Gov. guaranteed obligations			+245
State and local	1,232	1,193	+39
Corporate	2,875	2,904	-29
Foreign	60	200	-140
Total			+1,317
<i>1936</i>			
U. S. Gov. direct obligations			+4,305
U. S. Gov. guaranteed obligations			+33
State and local	1,121	1,140	-19
Corporate	4,985	4,007	+978
Foreign	160	290	-130
Total			+5,167
<i>1937</i>			
U. S. Gov. direct obligations			+3,259
U. S. Gov. guaranteed obligations			-63
State and local	908	908	
Corporate	2,600	2,582	+18
Foreign	150	320	-170
Total			+3,044

based chiefly on statistics supplied by the Farm Credit Administration and the Home Owners' Loan Corporation and on Statements of the Public Debt.

c) *State and municipal bonds.* Data concerning debts of states and municipalities are available only for June 30 or thereabouts from the annual report of the Secretary of the Treasury. The figures used to represent these debts at calendar year-ends are interpolations of these data, after deduction of the holdings of such securities by state and local sinking funds.

d) *Domestic corporate and foreign securities.* Difference between the gross proceeds from cash sales of new securities and the amount spent by issuers to redeem securities. The computation of these two items is described more fully in the next two sections.

2 CASH SALES OF NEW DOMESTIC CORPORATE AND FOREIGN SECURITIES (TABLE IV-2)

Figures for new issues include only issues of one year maturity or over and have been built up as follows:

a) *Issues offered for cash of which notice has appeared in the chief financial newspapers or statistical services, or records of the*

TABLE IV-2

CASH SALES OF NEW DOMESTIC CORPORATE AND OF FOREIGN SECURITIES ¹

(millions of dollars)

	1933	1934	1935	1936	1937
a Cash offerings other than lines b to e	380	540	2,680	4,750	2,400
b Investment company issues	120	150	170	200	200
c Small offerings not recorded in financial press	10	20	20	20	20
d Offerings of \$100,000 or less and intrastate issues not included in line a	10	10	10	10	10
e Oil and gas royalty interests	20	20	20	30	30
f Total cash offerings (a+b+c+d+e)	540	740	2,900	5,010	2,660
g Unsold amount of cash offerings	25	25	25	25	60
h Cash sales of domestic corporate securities (f-g)	515	715	2,875	4,985	2,600
i Cash offerings of foreign securities	70	10	60	160	150
j Cash sales of new securities (h+i)	585	725	2,935	5,145	2,750

¹ Lines a through h cover domestic securities only.

Commission, whether registered or not and whether publicly offered or sold privately. (A few private placings not so reported but known from other sources are also included.) This compilation is made by the staff of the Research and Statistics Section.

It has been assumed that all registered public utility issues, all private placings, and all other issues offered through underwriters were sold in full. For non-public utility issues offered for cash but not sold through underwriters [except issues registered on Form A-1, which have been taken account of under item (c)] a deduction of 25 per cent of the amount offered has been made to represent the proportion of the issues not actually sold. (To make these estimates it was necessary to classify new issues by method of offering. Since such a classification is not yet available before January 1936 it has been assumed for these preliminary estimates that the ratio of unsold to total offerings was the same for earlier years as from January 1936 to June 1937.)

b) *Investment company issues.* Taken from Table 2 of Chapter III, Part II, of the Securities and Exchange Commission's *Study of Investment Trusts and Investment Companies*. It is likely that only very small amounts of such securities have already been included under item 2 (a), thus constituting a minor item of duplication.

c) *Small registered issues for which no record of offering appeared in the press.* Sales estimated on the basis of follow-up reports on securities registered on Form A-1 under the Securities Act, collected by the Research and Statistics Section. See *Selected Statistics on Securities and on Exchange Markets* (Securities and Exchange Commission, August 1939), pp. 34-7.

d) *Issues of \$100,000 and less, and intrastate issues not included in (a) above.* No comprehensive information is available but the statistics of interstate issues between \$30,000 and \$100,000 for which prospectuses were filed with the Securities and Exchange Commission indicate that the aggregate volume of small new issues actually sold is almost negligible.

e) *Oil and gas royalty interests.* Rough estimates based on tabulations of actual sales reported to the Securities and Exchange Commission on Form G-1 for part of the period.

f) *Total cash offerings of domestic securities.* Sum of items (a) to (e).

g) *Unsold amount of cash offerings.* Estimated as described under item (a) above.

h) *Cash sales of domestic corporate securities.* Item (f) minus item (g).

i) *Cash offerings of foreign securities.* Obtained from registration statements, financial publications, and the *Balance of International Payments of the United States*.

j) *Cash sales of new securities.* Item (h) plus item (i).

3 CASH RETIREMENTS OF DOMESTIC CORPORATE AND OF FOREIGN SECURITIES (TABLE IV-3)

a) *Domestic corporate bonds redeemed in cash at maturity.* The amounts disbursed by corporations for payment of matured

TABLE IV-3
CASH RETIREMENTS OF CORPORATE AND OF FOREIGN SECURITIES
(millions of dollars)

	1933	1934	1935	1936	1937
a Domestic corporate bonds redeemed at maturity	381	344	313	493	371
b Domestic corporate bonds redeemed before maturity	167	243	2,242	2,961	1,850
c Domestic corporate tenders for bonds and stocks	35	35	35	35	35
d Domestic corporate retirements of preferred stock	40	31	244	448	246
e Other repurchases ¹	60	60	70	70	80
f Total domestic corporate retirements	683	713	2,904	4,007	2,582
g Retirements of foreign securities	180	120	200	290	320
h Total redemptions	863	833	3,104	4,297	2,902

¹ Includes only repurchases by investment companies.

bonds were estimated from *Moody's Investors Service* and *Standard Statistics'* lists of maturing bonds. A check was made of all maturing issues of \$1 million and over to determine the amounts actually paid off in cash at maturity, i.e., eliminating issues extended or defaulted. Issues of less than \$1 million were estimated to have been redeemed in the same proportion as the larger issues.⁵⁸ For small railroad issues, which consisted largely of

⁵⁸ For all issues under \$1 million an attempt was made to determine, by taking a few sample months, the percentage actually paid in cash, but the result was unsatisfactory because so little information on small issues of small companies could be obtained

equipment trust certificates on which defaults have been very rare, a cash payment ratio was applied which was about 20 per cent higher than the ratio for the issues of \$1 million and over.

Certain adjustments in the total monthly maturity figures were necessary in order to exclude issues floated outside the United States, as well as foreign dollar bonds. Moreover, corrections were made to strike out issues that had been called for redemption prior to maturity but were still carried in the maturity list. Deletions and additions were also made in several cases where issues were included or omitted from the lists by error, or otherwise. Adjustments were made only in the issues of \$1 million and over, but the percentage of error in the remainder is probably not great, as maturities of \$1 million and over comprise about 70 per cent of total maturities.

b) *Domestic corporate bonds redeemed before maturity.* Figures for bonds called for redemption prior to maturity are those compiled by the *New York Times* (also carried by the *Annalist*). From spot checks for several months we believe that this compilation is fairly accurate. Consequently we adjusted the *New York Times* total only to take care of the estimated premiums above par at which the calls were made. Sample studies showed an average call price for railroads of 105 per cent from 1933 to 1937; for industrials and miscellaneous issues, 102 per cent (except for 1936, when 103 per cent was estimated to be the average call price); while for public utility issues, the average price at which bonds were called appeared to be 102 per cent of par for 1933-35, 103 per cent for 1936, and 104 per cent for 1937.

Comparison of Standard Statistics' lists of bonds called for redemption with the individual issues reported by the *New York Times* shows that the two correspond very well for partial, entire, and sinking fund calls for domestic industrials, public utilities, and rails. (The test covers four or five months.)

The total individual issues posted in Standard Statistics nevertheless exceeded the *New York Times* computation of bonds called for redemption. The difference, therefore, must be due to the omission from the *New York Times* figures of some issues marked 'v.b.' (various bonds) and 'e.i.' (entire issue) or 'e.s.' (entire series) where definite information is difficult to get. Thus our figures probably underestimate actual retirements.

c) *Tenders for bonds and stocks.* A sampling of different months from 1934 through 1937 indicated that corporations allotted between \$2 and \$4 million per month for purchase of their bonds and stocks by tender, including tenders for sinking fund. A rough figure of \$35 million per year was used to represent actual retirements by this method.

d) *Retirements of preferred stock.* Tabulated from the press and financial services. The figure obtained in this way is not inclusive, however, because the data on the exact number of shares called are insufficient. Some entire and many partial calls were consequently omitted. The retirements of whole issues that were omitted were mostly those by small companies, the changes in whose capitalization would probably not have affected the total materially. It is believed that partial calls omitted are likewise not very large. No definite information exists on which to estimate the degree of understatement.

e) *Other repurchases.* Includes only the repurchases of their own securities by investment companies as reported in the Securities and Exchange Commission's *Study of Investment Trusts and Investment Companies* (Part II, Ch. III). Other repurchases had to be omitted because of the impossibility of obtaining adequate data.

f) *Total retirements by domestic corporations.* This figure, the sum of items (a) to (e), falls short of actual total retirements by an amount that, though unknown, is believed to be small relative to retirements included in the statistics. However, the absolute amount of retirements and repurchases, which apparently escape the usual sources of information, seems to have been considerable, possibly between \$500 million and \$1 billion for 1933-37, most of which was apparently in corporate domestic bonds. If these figures, based on estimates by the Department of Commerce of securities outstanding (*Survey of Current Business*, January 1939) and certain unpublished tabulations of Schedule N of the corporation income tax returns for 1936, are correct, then the underestimates of retirements are in the order of 5 to 10 per cent. While a certain underestimation of retirements is fairly certain, the evidence is not yet definite enough to make possible adjustment for individual years. For this reason no

adjustment has been attempted in the estimates derived from the available sources detailed under items (a) to (e)

g) *Retirements of foreign securities by issuers.* Taken from *The Balance of International Payments of the United States* (Table IV-4).

TABLE IV-4
CHANGE IN FOREIGN SECURITY HOLDINGS
(millions of dollars)

	1933	1934	1935	1936	1937
1 Foreign securities resold to foreigners	565	510	425	595	666
2 American securities sold to foreigners	760	480	1,305	2,685	2,274
3 Foreign securities purchased from foreigners	685	405	475	540	602
4 American securities repurchased from foreigners	580	480	970	2,070	2,014
5 Net (1+2-3-4)	+60	+105	+285	+670	+324
6 Bond redemption and sinking fund payments to foreigners	50	25	15	15	15
7 Net, incl. retirements of American securities (5-6)	+10	+80	+270	+655	+309

h) *Total redemptions.* Item (f) plus item (g).

4 COMPUTATION OF CHANGE IN HOLDINGS OF DOMESTIC NON-INDIVIDUALS (TABLE IV-5)

This figure is built up from the reported security holdings of different types of 'institutional' holders.

a) *U. S. Treasury investment accounts.* Figures for the security holdings of these accounts at the end of calendar years since 1934 were obtained from special tables prepared by the Treasury Department.⁵⁹ For 1932 and 1933 data concerning accounts for which special United States securities are issued were taken from the daily statement of the U. S. Treasury. Estimates for other funds were derived by averaging the June figures, which appear in the annual reports of the Secretary of the Treasury. In the case of funds not reported in the annual reports, estimates were made by extrapolation.

b) *U. S. Government corporations and credit agencies.* For

⁵⁹ Since December 1937 all holdings of this type are reported in a monthly release on 'Securities held as Investments in Trust Funds and in Accounts of Certain Governmental Corporations and Agencies'.

TABLE IV-5

CHANGE IN SECURITY HOLDINGS OF DOMESTIC NON-INDIVIDUALS

(millions of dollars)

	1932	1933	1934	1935	1936	1937
a U. S. Treasury investment accounts	658	810	1,242	1,639	1,801	3,567
b U S Government corporations and credit agencies	131	364	1,299	1,448	1,494	1,580
c Federal Reserve banks	1,440	1,685	1,903	1,858	1,832	1,907
d Operating commercial banks	13,658	13,144	16,994	18,792	21,121	19,676
e Closed national banks	137	115	84	19	5	0 ¹
f Mutual savings banks	4,049	4,156	4,384	4,682	4,926	5,192
g Private banks	310	326	348	442	452	359
h Legal reserve life insurance companies	7,586	7,914	9,234	10,911	12,699	14,421
i Fraternal orders	636	597	680	720	748	774
j Other insurance companies						
1) bonds	1,729	1,688	1,747	1,837	1,983	2,078
11) stocks	0 ¹	0	0	50	100	100
k State and municipal trust and investment funds	1,950	2,100	2,280	2,370	2,470	2,570
l Investment companies	0 ¹	150	150	200	160	35
m Other corporations ²	2,733	2,840	2,543	2,126	2,040	2,040 ³
n Building and loan associations ⁴	85 ⁵	85	286	235	216	216 ³
o Total	35,102	35,974	43,174	47,329	52,047	54,515
p Change in unadj. holdings		+872	+7,200	+4,155	+4,718	+2,468
q Adjustment for securities received in exchange for mortgages, loans, and other securities		—80	—2,011	—697	—80	
r Adjustment for profits and losses ⁶		+372	+193	—82	—335	+128
s Adj change in non-individual holdings (p+q+r)		+1,164	+5,382	+3,376	+4,303	+2,596

¹ Arbitrary base figure.² Tax-exempt securities only³ Assumed no change from 1936⁴ From Table 14, *Debts and Recovery* Figures represent 'investments', which include chiefly stock in Federal Home Loan Bonds and H O L C Bonds⁵ Assumed equal to 1933.⁶ Losses to be added and profits to be subtracted.

1934-37 figures were obtained from the daily Treasury statement. Year-end figures for 1932 and 1933 were estimated by averaging June figures given in special tables from the Treasury Department. Since these agencies, as well as the Treasury's investment accounts, do not apparently hold any short term securities, no further adjustments are necessary.

c) *Federal Reserve banks.* From 1934 to 1937 holdings of United States long term securities are reported separately in the *Federal Reserve Bulletin*. For 1932 and 1933, however, all United States securities held by the Federal Reserve banks are reported without distinction as to type. For these two years bills and certificates of less than one year maturity were estimated on the basis of information obtained from the Federal Reserve Board regarding the distribution of the System's holdings. These holdings of bills and certificates were deducted from the total reported United States security holdings in order to obtain the desired figure on holdings of Treasury securities with a maturity of over one year.

d) *Operating commercial banks.* For 1934-37 the figures, taken from reports of the Federal Deposit Insurance Corporation, cover operating insured banks. Estimates for 1932 and 1933 are based on the annual reports of the Federal Reserve Board which show holdings of U. S. Government obligations and other securities separately. The ratio, for each of these two groups, of holdings of all commercial banks to holdings of member banks of the Federal Reserve System, as given for June 30, 1934 in the 'Call Reports of Insured Banks' of the Federal Deposit Insurance Corporation, was applied to the figures for holdings of member banks alone at the end of 1932 and 1933. Holdings of Treasury bills are deducted, since they are not included in the figures from which institutional holdings are subtracted. They are reported separately from 1934 on and were estimated for 1932 and 1933 by assuming that at the end of those years they constituted the same proportion of total United States security holdings of commercial banks as at the end of 1934. Holdings of stock in Federal Reserve banks are also deducted.

e) *Closed national banks.* Information is available only on the sales in the New York market of the securities for the account of suspended national banks. The figures, which were supplied by

the Comptroller of the Currency, are supposed to cover the sales of all securities by such banks except those of local issues. Since no basis exists for an estimate of the sales by suspended state banks (and the sales of local securities by national banks) they are of necessity omitted from Table IV-5. The figures for 'adjusted change in non-individual holdings' in the last line of Table IV-5 therefore slightly overstate the increase in non-individual holdings from 1933 through 1937 and correspondingly understate the increase (or overstate the decrease) in individual holdings as shown in line 6 of Table IV. The extent of this omission, however, is very small compared to total changes in non-individual and individual holdings.

f) *Mutual savings banks*. Figures used for the end of each year from 1932 to 1935 are averages of June 30 data, as reported by the Comptroller of the Currency. For 1936 and 1937 the report gives the figures as of December 31. No deduction was made for Treasury bills, but it is assumed that their amount is small.

g) *Private banks*. Estimates for holdings at the end of 1935 and of 1936 were derived by averaging the June 30 figures reported by the Comptroller of the Currency. From 1932 to 1934 the estimates were made on the basis of these figures and supplementary information taken from the statements of J. P. Morgan and Co. A special release by the Treasury Department gave the figure for 1937. No deduction is possible for Treasury bills held.

h) *Legal reserve life insurance companies*. Based on reports of the Association of Life Insurance Presidents, the figures from this source being divided by the ratio of total admitted assets of the companies included to total admitted assets of all life insurance companies. Bill holdings, which have to be deducted, are taken directly from Poor's *Insurance Company Holdings* by totaling figures for individual companies.

For U. S. Government guaranteed obligations, totals are derived from Poor's *Insurance Company Holdings* for those 45 companies included in the *Wall Street Journal* weekly statistics on life insurance companies' purchases. The totals for these companies, which are assumed to represent 90 per cent of total admitted assets of all life insurance companies, are accordingly increased 11 per cent.

i) *Fraternal orders*. The estimate of total securities held by

fraternal orders at the end of each year from 1932 to 1935 is based on the holdings of United States and Canadian societies doing business in New York, as shown in the *New York Insurance Reports, Volume IV*, and the ratio of the assets of these societies to total assets of all United States and Canadian fraternal orders doing business in the United States, as given by *Statistics Fraternal Societies*. Aggregate bond and stock holdings for societies in New York, as given in the *New York Insurance Reports*, are divided by the ratios thus determined, the results being used as estimates of holdings of all societies. No deduction is possible for holdings of Treasury bills, which are believed to be small. For 1936 and 1937 total bonds and stocks are assumed to bear the same ratios to all assets as they do in the estimates for 1935, namely, 67.0 per cent for domestic societies and 45.0 per cent for Canadian societies.

j) *Other insurance companies*. Based on totals for casualty, surety, reciprocal, Lloyds, fire, marine, and automobile insurance companies as given in annual volumes of the *Spectator*. Only combined totals are available in 1932-36 for U. S. Government direct and guaranteed and foreign obligations. Of these totals, 7 per cent (the approximate ratio for 1937) is assumed to consist of foreign securities and the remainder of U. S. Government direct and guaranteed obligations.

Changes in balance sheet figures for stocks are strongly influenced by write-ups and write-downs reflecting changes in market price. Comparison of the balance sheet figures with movements of stock prices suggests that in 1934 and 1937 there were no significant net purchases or sales. In 1935 and 1936 small net purchases, somewhat arbitrarily estimated at \$50 million in each year, were indicated; no estimate was possible for 1933.

k) *State and municipal trust and investment funds*. The single available figure, referring only to tax exempt securities in June 1937, is published in the annual report of the Secretary of the Treasury, for the fiscal year 1937 (p. 468). This figure is approximately three times as great as the figure for 'city securities' plus 'other investments'⁶⁰ reported for cities with a population of

⁶⁰ This figure for 'other investments' includes an unknown amount of time deposits, according to the Bureau of the Census. Since the change in 'other investments' is not very great from year to year, the error involved in assuming that the item represents securities alone is probably not very important.

100,000 and over at the end of 1936 in *Financial Statistics of Cities*. In the absence of satisfactory data on which to base an estimate, it was necessary to assume that this ratio also applied in preceding years. Securities held in state and municipal sinking funds are not included in this item since they have been omitted in calculating the change in securities outstanding under item IV, 1 (c).

l) *Investment companies*. The figures for 1933-35 are based on the net purchase and sale balances of 133 management investment companies, accounting for about two-thirds of total assets of all such companies (see *Study of Investment Trusts and Investment Companies*, Part II, Ch. VIII). Estimates for 1936 and 1937 are based on similar data reported to the Securities and Exchange Commission by 23 companies which hold about 40 per cent of total assets of investment companies. See *Selected Statistics*, pp. 88-91.

m) *Other corporations* For 1932-36 figures for tax-exempt securities were taken from the combined balance sheet of non-financial corporations submitting balance sheets with their income tax returns, published in *Statistics of Income*. The figure for 1937 is assumed to be the same as for 1936. (Changes in the holdings of financial corporations are taken care of in items (e) to (h), (j), and (l) above.)

Changes in the figures reported for other investments appear to reflect to a large extent write-ups and write-downs and other revaluation items. In the absence of data on actual purchases and sales and of any information on which to base a satisfactory estimate, other investments have been disregarded and only tax-exempt investments have been included in the calculations.

n) *Securities held by building and loan associations*. Since the total assets of these associations have already been included in computing the equity of individuals in building and loan associations, their holdings of securities must be deducted from individuals' holdings of securities in order to avoid double-counting. The figures for 1933-36 were taken from the Twentieth Century Fund study, *Debts and Recovery* (p. 303). The figures for 1932 and 1937 are assumed to be the same as those for 1933 and 1936, respectively.

o) *Total holdings of domestic non-individuals.* The sum of items (a) through (n) represents the actual or estimated balance sheet holdings, without correction to eliminate the effects of write-ups and write-downs and of realized profits or losses on the sale of securities of domestic non-individuals.

p) *Annual change in total holdings of domestic non-individuals (unadjusted).* Change in item (o).

q) *Securities received by institutions in exchange for mortgages, loans, and other securities.* These securities must be deducted from non-individuals' holdings, since they are not included in the figures for new issues of securities from which the changes in non-individuals' holdings are to be subtracted. The amounts of securities exchanged by institutions for mortgages or other securities were estimated on the basis of information supplied by the Home Owners' Loan Corporation and the Federal Farm Mortgage Credit Corporation.

r) *Profits and losses, write-ups and write-downs on securities.* Profits and write-ups are deducted from the change in unadjusted holdings, and losses and write-downs are added. The figure for commercial banks was estimated from reports for all member banks of the Federal Reserve System for 1933; for 1934-37 the figures were taken from the annual reports of the Federal Deposit Insurance Corporation for operating insured banks. The estimate for life insurance companies is based on the reports of five companies with 55 per cent of the assets of all United States legal reserve life insurance companies. No adjustment is possible for the holdings of other institutions. None is necessary, however, for items (j) and (l), where the estimates relate to net purchase or sale balances rather than changes in the value of holdings. For items (a), (b), (c), (k), and (m) profits and losses and write-ups and write-downs may be assumed to be small.

s) *Annual change in adjusted holdings of non-individuals.* This final figure is equal to item (p) plus items (q) and (r).

5 COMPUTATION OF CHANGE IN DOMESTIC INDIVIDUALS' BORROWINGS ON SECURITIES (TABLE IV-6)

For the purposes of this study only borrowing on securities by individuals or unincorporated businesses from banks or other incorporated lenders is taken into account. Borrowing by one

TABLE IV-6
CHANGE IN BORROWINGS ON SECURITIES
BY DOMESTIC INDIVIDUALS

(millions of dollars)

	1932	1933	1934	1935	1936	1937
a Commercial bank loans to brokers and dealers in securities	614	1,032	1,068	1,268	1,447	971
b 'All other loans' by commercial banks to individuals on securities	3,420	2,676	2,328	2,152	2,068	2,044
c Total individuals' borrowings on securities	4,034	3,708	3,396	3,420	3,515	3,015
d Foreigners' debit balances with brokers	60	100	94	90	103	66
e Total net domestic individuals' borrowings on securities (c-d)	3,974	3,608	3,302	3,330	3,412	2,949
f Change		-366	-306	+28	+82	-463

individual from another is omitted since it must cancel in the national total, the liability of the borrower being offset by the asset of the lender. Adjustments have to be made, however, for borrowing on securities by foreigners from domestic individuals.

Fairly satisfactory and comprehensive figures are available for the loans on securities made by banks to brokers and dealers in securities. Most of the borrowers may be assumed to be unincorporated. Considerably more serious difficulties are encountered in determining the borrowing on securities from banks by individuals. Some of these loans are made to domestic corporations and to foreigners but no definite information as to the proportion is available. For the purposes of this calculation, changes in borrowing on securities by domestic individuals and unincorporated businesses from corporations other than banks were assumed to be negligible. Table IV-6 shows the component figures, the details of which are discussed in the following paragraphs.

a) *Commercial bank loans to brokers and dealers in securities.* Figures for all insured banks are available for the end of 1934 and subsequent years from the annual reports of the Federal Deposit Insurance Corporation. An entirely satisfactory comparable estimate for 1932 and 1933 can be made on the basis of

the figures for all member banks reported annually by the Board of Governors of the Federal Reserve System. These figures run consistently about 3 per cent below those for operating insured commercial banks in the years when both are known. It has been assumed that, in the period studied, all the changes in this figure may be attributed to unincorporated brokers and dealers.

b) *'All other loans' by commercial banks to individuals on securities.* Based on 'all other loans on securities' by operating insured commercial banks from 1934 to 1937, as reported by the Federal Deposit Insurance Corporation. The figure for 1932 and 1933 was estimated from the statistics for member banks of the Federal Reserve System in a manner similar to the estimate in item (a), except that in this case the ratio of member to insured banks was only 90 per cent.

In the absence of any concrete indications it has been assumed, for the present purposes, that about two-thirds of such loans are attributable to borrowing by domestic individuals and unincorporated businesses.

c) *Total individuals' borrowings on securities.* Item (a) plus item (b).

d) *Foreigners' debit balances with brokers.* This figure, taken since 1934 from *Statistics of Capital Movements*, published by the Treasury Department, must be deducted from total individuals' borrowings on securities in order to obtain the net liabilities of domestic individuals on securities. Figures for 1932 and 1933 are estimated on the basis of total customers' debits with brokers.

e) *Total net domestic individuals' borrowings on securities.* Item (c) minus item (d).

V Change in Individuals' Equity in Nonfarm Dwellings (Table V)

This series is built up by estimating the annual expenditure on construction, additions to, alterations, and repairs of one to four family nonfarm dwellings, deducting depreciation, and adjusting the remainder for changes in the mortgage indebtedness of individuals to institutions on account of such dwellings and for changes in institutional holdings of such dwellings.

TABLE V
CHANGE IN INDIVIDUALS' EQUITY IN NONFARM DWELLINGS

	(millions of dollars)				
	1933	1934	1935	1936	1937
1 Net construction of one to four family nonfarm dwellings ¹	-1,169	-1,105	-732	-235	-135
2 Change in institutional holdings of one to four family nonfarm dwellings ²	+363	+426	+314	+145	+165
3 Change in mortgages on one to four family nonfarm dwellings ³	-1,227	+211	-191	-315	-101
4 Change in individuals' equity	-305	-1,742	-855	-35	-199

¹ From Table V-1.

² From Table V-2

³ From Table V-3

The final figures were computed as follows:

1. *Net construction of one to four family nonfarm dwellings.* Derived from estimates of new construction, additions, alterations, repairs, and depreciation. For details see Section 1 and Table V-1, below.

2. *Change in institutional holdings of one to four family nonfarm dwellings.* Increases in institutional holdings must be deducted from net construction and decreases added thereto in order to find the net change in individuals' ownership. The figures are estimates based on data obtained from various sources, indicated in the footnotes to Table V-2.

3. *Change in mortgages on one to four family nonfarm dwellings held by institutions.* In order to compute the equity of individuals, increases in individuals' mortgage indebtedness to institutions must also be deducted from net construction and decreases must be added. The figures are estimates of the Federal Home Loan Bank Board. For details see footnotes to Table V-3.

4. *Change in individuals' equity in nonfarm dwellings.* Item 1 minus items 2 and 3.

1 COMPUTATION OF NET CONSTRUCTION OF ONE TO FOUR FAMILY NONFARM DWELLINGS (TABLE V-1)

a) *Cost of all new nonfarm residential construction.* The figures are those prepared by the Division of Construction and

Public Employment, Department of Labor, from statistics of building permits. They do not include hotels, clubhouses, dormitories, etc.

TABLE V-1
NET CONSTRUCTION OF ONE TO FOUR FAMILY NONFARM DWELLINGS

(millions of dollars, except line b)

	1933	1934	1935	1936	1937
a Cost of all new nonfarm residential construction	193	199	557	1,132	1,163
b Percentage of line a composed of one to four family dwellings	85	88	86	83	86
c Cost of new one to four family nonfarm dwellings	164	175	479	940	1,000
d Additions to, alterations, and repairs of nonfarm dwellings	92	126	187	204	224
e Assumed cost of additions to, alterations, and repairs of one to four family nonfarm dwellings	69	95	140	153	168
f Annual depreciation on one to four family nonfarm dwellings ¹	1,402	1,375	1,351	1,328	1,303
g Net construction of one to four family nonfarm dwellings (c+e-f)	-1,169	-1,105	-732	-235	-135

¹ CALCULATION OF DEPRECIATION (millions of dollars)

	1933	1934	1935	1936	1937
1 Cost value, beginning of year	70,000	68,598	67,223	65,872	64,544
2 Additions to stock to be depreciated (50% of new construction)	116	135	310	546	584
3 Depreciation (2% of 1+2)	1,402	1,375	1,351	1,328	1,303
4 Value, end of year (1-3)	68,598	67,223	65,872	64,544	63,241

b) *Percentage of item (a) consisting of one to four family nonfarm dwellings.* Same source as item (a).

c) *Cost of new one to four family nonfarm dwellings.* Product of items (a) and (b) divided by 100.

d) *Additions to, alterations, and repairs of nonfarm dwellings.* Same source as item (a). Also covers only housekeeping dwellings.

e) *Estimated additions to, alterations, and repairs of one to*

four family nonfarm dwellings. Assumed to be 75 per cent of item (d).

f) *Annual depreciation of one to four family nonfarm dwellings.* Estimated at 2 per cent of the cost of the dwellings (excluding land values). The depreciated cost value at the beginning of 1933 was estimated to be approximately \$70 billion, equivalent to about \$3,000 per nonfarm dwelling unit. For the detailed computation of this item see footnote to Table V-1.

g) *Net construction of one to four family nonfarm dwellings.* Item (c) plus item (e) minus item (f).

TABLE V-2

INSTITUTIONAL HOLDINGS OF ONE TO FOUR FAMILY NONFARM DWELLINGS

(millions of dollars)

	1932	1933	1934	1935	1936	1937
1 Commercial banks	160	169	201	238	242	225
2 Mutual savings banks	120	190	270	330	360	400
3 Life insurance companies	134	196	256	302	305	305
4 Building and loan associations	589	746	930	1,030	1,030	930
5 Mortgage and other companies	175	240	310	375	390	400
6 Home Owners' Loan Corporation				6	99	331
7 Total	1,178	1,541	1,967	2,281	2,426	2,591
8 Change		+363	+426	+314	+145	+165

Line 1 For 1937, *Sixth Annual Report of Federal Home Loan Bank Board*, Exhibit I, p. 100. Figures for other years are estimated on the assumption that holdings of one to four family dwellings bore the same ratio to total urban real estate holdings as did loans on such dwellings to loans on all urban real estate at the end of each year. This ratio was based on Federal Home Loan Bank Board estimates of loans on one to four family dwellings and FDIC figures for total loans on urban real estate. It was applied to the figure for total urban real estate held as reported by the Federal Deposit Insurance Corporation or Federal Reserve Board.

Line 2 Sources same as for line 1.

Line 3 For 1932-34 derived in a way analogous to that described for line 1, for 1935-37, from *Federal Home Loan Bank Review*.

Line 4 Assumed equal to 90 per cent of holdings of real estate owned, not including office buildings, as reported in *Building and Loan Annals* for 1932-37.

Line 5 For 1937, estimate of the Federal Home Loan Bank Board. Figures for 1932-36 derived by assuming that holdings of one to four family dwellings by mortgage and other companies increased between the end of 1932 and the end of 1937 at the same rate as those for banks and life insurance companies taken together.

Line 6 From annual reports of Home Owners' Loan Corporation.

TABLE V-3
MORTGAGES HELD BY INSTITUTIONS ON ONE TO FOUR FAMILY
NONFARM DWELLINGS¹

	(millions of dollars)					
	1932	1933	1934	1935	1936	1937
1 Commercial banks	1,995	1,810	1,189	1,189	1,230	1,400
2 Mutual savings banks	3,375	3,200	3,000	2,850	2,750	2,700
3 Life insurance companies	1,835	1,715	1,535	1,351	1,305	1,330
4 Saving and loan associations	5,756	4,906	4,012	3,467	3,361	3,480
5 Home Owners' Loan Corporation		103	2,209	2,897	2,763	2,398
6 Total	12,961	11,734	11,945	11,754	11,409	11,308
7 Change		-1,227	+211	-191	-345	-101

SOURCE *Sixth Annual Report of Federal Home Loan Bank Board*, p. 16, for 1934-37 figures; 1932 and 1933 figures supplied by the Board.

¹ Does not include loans held by title and mortgage companies, construction companies, trust departments of commercial banks, and miscellaneous lenders

VI Change in Individuals' Equity in Automobiles (Table VI)

It has been assumed that all passenger cars are owned and operated by individuals or unincorporated businesses and that all trucks are owned and operated by corporate business or government units. While neither assumption is strictly correct the errors are probably not very large and tend to cancel one another to a certain extent.

TABLE VI
INDIVIDUALS' EQUITY IN AUTOMOBILES

	(millions of dollars)				
	1933	1934	1935	1936	1937
1 Retail sales	975	1,341	1,992	2,539	2,706
2 Depreciation	1,561	1,678	1,699	1,842	1,930
3 Net	-586	-337	+293	+697	+776
4 Change in instalment debt	+90	+100	+60	+366	+84
5 Change in individuals' equity	-676	-437	+233	+331	+692

The final figure is computed as follows:

1. *Retail sales of passenger cars.* Estimates (since published with minor changes) made by George Terborgh. The general

method of computation used by him is to estimate the average wholesale value of passenger cars in the United States on the basis of published figures for factory sales. The resulting average wholesale value is increased by an estimated average mark-up to obtain an estimate for average retail value per car. This last figure is then multiplied by the reported number of new passenger cars sold at retail.

2. *Depreciation* Based on unpublished figures by Terborgh, who has estimated the depreciation on automobiles in 1929 dollars. His estimate was converted into current dollars on the basis of his price figures. The basic estimate uses depreciation rates based on a life expectancy increasing from 7.95 to 8.25 years.

3. *Net change in the value of individuals' automobiles.* Item 1 less item 2.

4. *Change in instalment debt.* The figure for 1937 is based on Department of Commerce figures for outstanding retail automobile receivables of 224 identical organizations at the end of 1936 and of 1937. No satisfactory year-end figures are available before 1936. The net change for 1936 has been approximated, however, by using the figure for the change during the year ended January 31, 1937. The figures for 1933-35 are rough estimates based on the percentage of new cars sold on the instalment plan, the average amount per instalment note, and the estimated instalment debt outstanding as a percentage of new business.

5. *Change in individuals' equity.* Item 3 less item 4.

VII Change in Individuals' Equity in Durable Consumers' Goods other than Houses and Automobiles (Table VII)

The principle used to compute this figure is identical with that used for automobiles. The figures for depreciation and for changes in instalment debt are even less satisfactory than the corresponding figures in the preceding series.

Change in owners' equity is estimated as follows:

1. *Retail sales of household goods.* Estimated by Terborgh.
2. *Estimated depreciation.* Based on Terborgh's estimate of depreciation on household goods in 1929 prices. Conversion to current prices is based on the relation between Terborgh's fig-

ures for expenditures in terms of 1929 and current prices. This figure should be regarded merely as an informed guess. Solomon Fabricant, who has made the most thorough published study of depreciation, did not try to estimate depreciation on furniture or other durable consumers' goods because of the unsatisfactory nature of the data.⁶¹

3. *Net change in household goods.* Item 1 minus item 2.
4. *Construction by non-profit institutions.* Estimated by Terborgh.

TABLE VII

INDIVIDUALS' EQUITY IN DURABLE HOUSEHOLD GOODS OTHER
THAN HOUSES AND AUTOMOBILES

(millions of dollars)

	1933	1934	1935	1936	1937
1 Retail sales of household goods	2,470	3,050	3,550	4,500	5,000
2 Estimated depreciation	3,227	3,341	3,411	3,532	3,766
3 Net change in household goods (1-2)	-757	-291	+139	+968	+1,234
4 Construction by non-profit institutions	96	95	114	134	190
5 Estimated depreciation on structures of non-profit institutions	228	238	236	248	280
6 Net change in structures of non-profit institutions (4-5)	-132	-143	-122	-114	-90
7 Total net change (3+6)	-889	-434	+17	+854	+1,144
8 Change in instalment debt	+100	+100	+300	+300	+100
9 Change in individuals' equity (7-8)	-989	-534	-283	+554	+1,044

5. *Estimated depreciation on structures of non-profit institutions.* The estimate in current prices is based on Terborgh's estimate of depreciation in 1929 prices.

6. *Net change.* Item 4 minus item 5.

7. *Total net change.* Item 3 plus item 6.

8. *Change in instalment debt.* A very rough estimate based on the fragmentary information available.

9. *Change in individuals' equity.* Item 7 minus item 8.

VIII Business Saving of Farmers (Table VIII)

Part of the saving of farmers, namely, changes in their bank deposits, cash and equity in insurance contracts, as well as their

⁶¹ Cf. *Capital Consumption and Adjustment*, p. 139.

net absorption of securities and their purchases of household machinery, has necessarily already been included with saving of individuals in these forms. A segregation is not feasible with the material at our disposal. The saving of farmers which must be separately calculated therefore includes only the net investment in new machinery, farm buildings, and livestock, adjusted for changes in mortgage debt and in such types of short term debt as do not enter into the computations of 'individual saving'.⁶² Changes in crop inventories, which should logically be included, had to be omitted because the data are inadequate. This omission is partly offset by the omission of the change in liabilities of farmers on account of crop loans.

To obtain farmers' net business saving a figure representing the surrender of farm real estate by farmers to others must also be deducted. In computing farmers' indebtedness and farm real estate held by non-farmers, we have used the farm indebtedness and real estate held by institutions. Since the holdings of individual non-farmers are probably small this procedure introduces no appreciable error into the final figure for business saving of

TABLE VIII
BUSINESS SAVING OF FARMERS

		<i>(millions of dollars)</i>				
		1933	1934	1935	1936	1937
1	Expenditure on farm machinery	241	375	593	730	900
2	Expenditure on farm buildings	175	200	350	450	500
3	Total (1+2)	416	575	943	1,180	1,400
4	Depreciation	972	1,004	993	1,021	1,026
5	Net (3-4)	-556	-429	-50	+159	+374
6	Investment in livestock	+40	-239	-17	-78	-38
7	Net change in farmers' mortgage indebtedness to institutions ¹	-311	-128	-208	-142	-114
8	Net change in farmers' short term indebtedness to institutions ²	-136	-302	+202	-136	+273
9	Change in institutional holdings of farm real estate ³	+186	+144	+77	+79	-32
10	Business saving of farmers (5+6-7-8-9)	-255	-382	-138	+280	+209

¹ From Table VIII-1.

² From Table VIII-2

³ From Table VIII-3

⁶² Farmers' indebtedness to farm machinery companies is not included

farmers. In any case no error is introduced into the figure for total national saving because farm real estate and farm debt held by individual non-farmers is not included in individual saving in the form of houses and securities.

The final estimate is derived from the following data:

1. *Expenditure on farm machinery.* Figures for 1933-35 taken from *Income from Farm Production, 1935*, published by the Department of Agriculture. Figures for 1936 and 1937 estimated by the Agricultural Adjustment Administration. This whole series is now being revised by the Bureau of Agricultural Economics but the revised data are not yet available.

2. *Expenditure on farm buildings.* The 1933 figure was obtained from Simon Kuznets' *Commodity Flow and Capital Formation, Volume I*, and is the sum of the figures given there for farm dwellings and farm construction and repair other than dwellings. The figures for 1934-37 are very rough estimates based on available building data.

3. *Total expenditure on farm machinery and farm buildings.* The sum of items 1 and 2.

4. *Depreciation on farm machinery and farm buildings.* Figures for 1933-35 taken from Fabricant's *Capital Consumption and Adjustment* (pp. 114 and 145). He has used the estimates of the Bureau of Agricultural Economics and stepped them up slightly to correct for underreporting of farm machinery (p. 118). The figures for 1936 and 1937 were estimated on the basis of the rates used in preceding years and the additions to the stock of machinery and buildings given in items 1 and 2.

5. *Net value of change in farm machinery and farm buildings.* Item 3 less item 4.

6. *Investment in livestock.* Estimated by multiplying the change in the number of livestock on farms by an estimated farm value, represented by the mean of the farm values at the beginning and the end of each year. The final figure is the sum of separate computations for each kind of livestock. The basic figures come from *Agricultural Statistics, 1937* and *United States Livestock Reports*.

7. *Change in farmers' mortgage indebtedness to institutions.* Based chiefly on the institutional holdings of farm mortgages at the end of each year as reported in the *Agricultural Finance Re-*

view, May, 1939, published by the U. S. Department of Agriculture. Holdings of open state and national banks at the end of 1932 and 1933 were estimated by multiplying the figure for all deposit banks given in D. C. Horton, *Long Term Debts of the United States* (U. S. Bureau of Foreign and Domestic Commerce, 1937) by the ratio between holdings of open state and national banks and those of all deposit banks at later dates.

The increase in farmers' liabilities to institutions in 1934 and 1935 was more than offset by Federal Farm Mortgage bonds which the institutions received in exchange for mortgages. A figure representing the amount of these bonds issued in exchange for mortgages must, therefore, be deducted from the change in mortgage indebtedness to institutions in obtaining the true change in indebtedness. The amount of bonds so received was obtained from the Farm Credit Administration. The derivation of item 7 is shown in detail in Table VIII-1.

TABLE VIII-1
FARM MORTGAGES HELD BY INSTITUTIONS
(millions of dollars)

	END OF YEAR					
	1932	1933	1934	1935	1936	1937
1 Federal land banks and land bank commissioners	1,106	1,274	2,502	2,854	2,889	2,836
2 Joint stock land banks	459	392	256	176	133	104
3 Life insurance companies	1,869	1,661	1,259	1,055	936	895
4 Open state and national banks	840	640	499	488	488	501
5 Farm Security Administration						4
6 Three state credit agencies	84	80	62	48	33	25
7 Total	4,358	4,047	4,578	4,621	4,479	4,365
8 Change		-311	+531	+43	-142	-114
9 Assets received in exchange for mortgages ¹			659	251		
10 Change in mortgage indebtedness of farmers to institutions, less assets received in exchange		-311	-128	-208	-142	-114

¹ These figures represent Federal Farm Mortgage bonds

8. *Net change in farmers' short term indebtedness to institutions.* This figure, the computation of which is shown in Table VIII-2, is taken chiefly from the *Agricultural Finance Review*, May 1939 (p. 83). The figure for Farm Security Administration loans outstanding at the end of 1935 and 1936 is estimated from data furnished by that organization. Short term indebtedness of farmers to commercial banks at the end of 1932, 1933, and 1935 is estimated, the estimates for the first two years being very rough.

TABLE VIII-2
SHORT TERM LOANS TO FARMERS
(millions of dollars)

		END OF YEAR					
		1932	1933	1934	1935	1936	1937
1	Commercial banks	1,400	1,100	808	726	594	788
2	Federal intermediate credit banks	83	61	56	47	41	40
3	Production credit associations		0	61	94	105	138
4	Regional agricultural credit corporations	24	145	87	43	26	16
5	Emergency crop loans	91	91	79	107	104	115
6	Farm Security Administration				8	80	162
7	Drought relief loans			32	66	60	57
8	Commodity Credit Corporation		65	37	271	216	183
9	Total	1,598	1,462	1,160	1,362	1,226	1,499
10	Change		—136	—302	+202	—136	+273

9. *Change in institutional holdings of farm real estate.* This item, shown in Table VIII-3, was taken from the *Agricultural Finance Review*, November 1938 (p. 63). Figures for farm real estate holdings of commercial banks for 1932-35 were estimated by assuming that the farm real estate held by active insured commercial banks was about one-fifth of the non-bank real estate held by all member banks—the ratio known to have prevailed on June 30 and December 31, 1936. While this estimate may be subject to a considerable percentage error, any mistake in the estimate of the change in holdings is not large enough to affect the total carried over to the final table.

10. *Business saving of farmers.* Sum of items 5 and 6, less the sum of items 7, 8, and 9.

TABLE VIII-3
FARM REAL ESTATE HELD BY INSTITUTIONS
(millions of dollars)

	END OF YEAR					
	1932	1933	1934	1935	1936	1937
1 Federal land banks and farm mortgage corporations	83	97	97	120	135	132
2 Life insurance companies	317	465	601	646	713	705
3 Joint stock land banks	72	86	82	78	73	62
4 Three state credit agencies	47	56	60	62	68	72
5 Active insured commercial banks	54	55	63	74	70	56
6 Total	573	759	903	980	1,059	1,027
7 Change		+186	+144	+77	+79	-32

IX Corporate Saving (Table IX)

The basic figures for the estimate of corporate saving are taken from income tax returns as published in *Statistics of Income*. These figures differ considerably from corporate saving or dis-saving as it would be if calculated to conform to the basic con-

TABLE IX
CORPORATE SAVING
(millions of dollars)

	1933	1934	1935	1936	1937
1 Compiled net profits less total tax	-1,353	2,379	4,688	6,580	
2 Cash dividends paid	3,128	4,890	5,941	7,379	
3 Net saving, unadj. (1-2)	-4,481	-2,511	-1,253	-799	
4 Capital losses	1,686	297	239	142	
5 Capital gains	262	242	470	581	
6 Net saving, adj (3+4-5)	-3,057	-2,456	-1,484	-1,238	-900 ¹
7 Depreciation and depletion	3,742	3,674	3,701	3,723	3,750
8 Gross saving, adj (6+7)	+685	+1,218	+2,217	+2,485	+2,850

¹ Estimated from Department of Commerce figures which run slightly higher than those computed from *Statistics of Income*

cepts of current income and saving used in this study. It would be necessary to consider adjustment of the present figures for (1) capital gains and losses, (2) inventory profits and losses, (3) the write-down or write-off of bad debts, (4) other write-ups and

write-downs reflecting purely book transactions. In addition it would be desirable to correct the figures for the underreporting of net income and the consequent understatement of corporate saving (or the overstatement of corporate dissaving) which apparently results from the use of income tax figures.

An adjustment for capital gains and losses can be made simply by subtracting capital gains from and adding capital losses to the unadjusted figures, since these gains and losses are reported in *Statistics of Income*.

No satisfactory data exist for adjusting corporate profits and saving for the revaluation element in inventory changes. In any case doubt exists as to just how such an adjustment should be made.

Debts written off or written down may be regarded either as elements of cost or as revaluations. We have preferred to regard them as elements of cost for which no adjustment need be made. Even if they were regarded as revaluations, however, it would be difficult to adjust for them because only a gross figure is reported in *Statistics of Income* while the amount for which an adjustment should be made is only the net bad debts, i.e., debts written off on which no recoveries were subsequently realized. No information is at present available that would make possible adjustments for other revaluations or for underreporting of net income.

In order to calculate gross corporate saving (net corporate saving plus depreciation and depletion charges), it is also necessary to determine the total allowance for depreciation and depletion. Figures for corporations from 1933 to 1936 were taken from *Statistics of Income*; that for 1937 was estimated.

X Saving of State and Local Governments (Table X)

Statistics of the saving of state and local governments are among the poorest used, and, because of the magnitudes of the sums involved, the estimate of saving by these government units is probably subject to as great an absolute error as any other component of the total.

Up to 1932 the Bureau of the Census published financial data for states and for cities with a population of 30,000 and over. In

TABLE X
SAVING OF STATE AND LOCAL GOVERNMENTS

(billions of dollars)

	1933	1934	1935	1936	1937
1 State revenues	1.8	2.0	2.2	2.6	2.8
2 Local revenues	5.4	5.3	5.4	5.5	5.7
3 Total revenues (1+2)	7.2	7.3	7.6	8.1	8.5
4 State expenditures	2.0	2.1	2.2	2.4	2.4
5 Local expenditures	5.2	5.4	5.5	5.8	5.8
6 Total expenditures (4+5)	7.2	7.5	7.7	8.2	8.2
7 Capital outlays	1.0	1.2	1.2	1.7	1.6
8 Current expenditures (6-7)	6.2	6.3	6.5	6.5	6.6
9 Gross saving ¹ (3-8)	1.0	1.0	1.1	1.6	1.9
10 Depreciation	0.5	0.5	0.5	0.5	0.5
11 Net saving (9-10)	0.5	0.5	0.6	1.1	1.4

¹ Gross saving for cities having populations of 100,000 and over in 1933-36 was \$310, 493, 654, and 556 million

1933 the compilation of state statistics was discontinued and statistics were collected only for cities with populations of 100,000 and over. Although the collection and publication of state statistics is being resumed, beginning with data for 1937, we are without any reliable information on the financial activities of a major sector of the economy during the important period covered by this study.

In the absence of Census data for states, localities, and cities with populations of less than 100,000 since 1932, it was necessary to consult figures presented in the National Industrial Conference Board's series, *The Cost of Government in the United States*, the Twentieth Century Fund's study, *Facing the Tax Problem*, an unpublished study conducted by the Senate's Special Committee to Investigate Unemployment and Relief,⁶³ and

⁶³ The Senate Committee's study, which covers 24 state governments, presumably follows Census definitions and classifications, but there is no indication as to how many of the data are the result of questionnaires and how many of original classification. Although the Census includes subventions and grants in receipts, the Senate Committee's study apparently excludes for the most part federal grants

the Social Security Board's tabulation of receipts entitled *Fiscal Capacity of States*.⁶⁴

The saving of state and local governments has been estimated from the following data:

1. *State revenues*. The estimated total of revenue receipts in Table X is the sum of total state and local tax collections as estimated by the National Industrial Conference Board and state and local non-tax revenues as estimated by the Twentieth Century Fund (without description of bases and details). The figure may be too small, since it is probably based on the relation of such revenues to taxes existing in 1932, which ratio has very probably increased. Total revenues exclude subventions and grants.

2. *Local revenues*. For derivation, see item 1.

3. *State and local revenues*. Item 1 plus item 2.

4. *State expenditures*. Expenditure figures for 1933-35 taken from *Facing the Tax Problem*. The estimates for state expenditures presented there for 1933, 1934, and 1935 are based on actual fiscal statements published in such official state reports as could be obtained and on letters from state officials. By this method data for 1933 and 1934 were obtained for 45 states (covering 94 per cent of all state expenditures in 1932) and in 1935 for 39 states (covering 85 per cent of all state expenditures). These figures were extended by the authors to cover all states on the assumption that the trend in the missing states was the same as that in the states covered.⁶⁵ The figures for 1936 and 1937 are rough estimates based on data for the preceding years and on current

for relief, while including other grants. Again, there may be differences in the treatment of receipts from public service enterprises (although this cannot be checked). The Census gives the aggregate receipts of such enterprises, while the Senate Committee's study in its instructions asks only for the profits transferred to the general departments.

⁶⁴ The Social Security Board tabulation of revenues differs from the Census tabulation in several respects. Federal aid is not included, although separate totals for it are given. Agency revenues such as pension assessments are not included, although they are included in the Census tabulation. Tax collections made by states as agents for local government units, however, are excluded from the Census totals for state revenues but are included in the Social Security Board totals. Certain other receipts such as donations and exceptional returns from sale of property are included in Census totals but omitted from Social Security Board totals.

⁶⁵ *Facing the Tax Problem*, p. 97.

press releases by the Bureau of the Census covering certain states for 1937.

5. *Local expenditures.* Information concerning local expenditures is in even worse form than data for states and on local receipts. Figures for 1933, 1934, and 1935 were estimated by the authors of *Facing the Tax Problem* on the basis of local receipts and bond issues and retirements (p. 538). Their estimate for 1936 was used for both 1936 and 1937. For 1933-35 the figures for local expenditures are from \$250 to \$400 million lower than those of the National Industrial Conference Board. The state figures differ by less than \$100 million.⁶⁶

6. *State and local expenditures.* Item 4 plus item 5.

7. *Capital outlays.* In order to reduce the figure for total expenditures to one for current expenditures it was necessary to estimate state and local capital outlays. The only continuous source for such estimates is the annual Census report for cities with populations of 100,000 and over. Material for states is available for only one year, in *Financial Statistics of State and Local Governments, 1932*. On the basis of these sources a rough estimate was made by computing a relative for the ratio of capital outlays to expenditures for cities over 100,000 and comparing this with the ratio for states in 1932 to find the ratio for states in subsequent years. These ratios were then applied to the estimated state expenditures. A comparison of the very rough estimates so obtained with the cost of construction by state and local governments, as estimated by the Department of Commerce ('Recent Developments in Construction Activity', *Survey of Current Business*, August 1939, Table 5) shows the following picture (in millions of dollars):⁶⁷

	1933	1934	1935	1936	1937
Computed capital outlays	906	849	1,147	1,390	
Estimated state and local construction	904	1,091	1,001	1,653	1,490

Comparison of Department of Commerce construction figures with those compiled by Peter Stone of the Works Progress Ad-

⁶⁶ Because of the crudity of the local data and of the estimates for capital outlays the figures are shown only to the nearest hundred million dollars

⁶⁷ Neither figure includes work-relief construction.

ministration in *Construction Expenditures and Employment* suggests that any error involved in the former is probably on the side of understatement. They therefore may be taken as a minimum for capital outlays. Since there are capital outlays other than construction the estimates for capital outlays in Table X were derived by slightly increasing the cost of state and local construction as estimated by the Department of Commerce

8. *Current expenditures*. Item 6 minus item 7.

9. *Gross saving*. Equal to the difference between current revenue (item 3) and current expenditures (item 8).

10. *Depreciation*.⁶⁸ Based on:

a) Fabricant's estimates of the value of all government property (exclusive of roads and sewers) as of the end of 1932 (\$20,269 million for state and local governments and \$4,365 million for the federal government; see *Capital Consumption and Adjustment*, pp. 126 and 137).

b) Depreciable capital outlays during 1933-37. Such outlays are equal, for state and local governments, to those shown in item 7 minus outlays for roads and sewers constructed by non-relief labor (\$709, \$875, \$690, \$991, and \$953 million for the years 1933 to 1937, respectively; see 'Recent Developments in Construction Activity', Table 4).

c) An annual rate of depreciation of $2\frac{1}{2}$ per cent (Fabricant, *op. cit.*, p. 136). Following Fabricant's procedure, we assume that depreciation on roads and sewers is covered by maintenance expenditures which are not treated as capital outlays in our calculations. Such expenditures amounted to \$441 million in 1933; \$498 million in 1934; \$518 million in 1935; \$561 million in 1936; and \$560 million in 1937, according to Department of Commerce estimates. This assumption may involve an understatement of depreciation, especially since capital expenditures have been increasing over the period studied. However, capital outlays on roads and sewers by W.P.A., C.W.A., and C.C.C. labor

⁶⁸ The calculation of depreciation on both federal and state and local property was revised as a result of criticism and suggestions received from Mr George O May. In the original estimates some inconsistencies existed between the additions to government property on which depreciation was computed and the annual estimated additions to physical property for 1933-37. These inconsistencies have now been eliminated so far as is possible with the rather unsatisfactory primary material.

are depreciated because it is not feasible to segregate them from other work relief capital outlays.

The calculation follows the procedure used in calculating the depreciation on one to four family nonfarm dwellings shown in Table V-1.

11. *Net saving.* Item 9 minus item 10.

XI Saving of the Federal Government (Table XI)

The federal government does not keep an inclusive balance sheet; it lists only liabilities and cash assets. Its saving can there-

TABLE XI
SAVING OF THE FEDERAL GOVERNMENT

		(millions of dollars)				
		1933	1934	1935	1936	1937
1	Total receipts	2,526	3,492	3,857	4,372	6,312
2	Capital receipts	31	8	10	26	37
3	Seignorage	1	54	31	46	40
4	Current receipts (1—2—3)	2,494	3,430	3,816	4,300	6,235
5	Total expenditures	5,106	8,028	7,613	8,651	8,373
6	Public works ¹	513	799	745	1,082	907
7	Loans	1,130	402	—77	—540	—8
8	Subscriptions to capital stock and paid-in surplus	374	586	115	39	52
9	Debt retirements	37	472	769	118	92
10	Capital outlay of WPA, CWA, and CCC	134	408	309	970	758
11	Total deductions (6+7+8+9+10)	2,188	2,667	1,861	1,669	1,801
12	Current expenditures (5—11)	2,918	5,361	5,752	6,982	6,572
13	Gross saving (4—12)	—424	—1,931	—1,936	—2,682	—337
14	Saving under "Trust Accounts, Increment on Gold, etc."	50	50	47	14	14
15	Total gross saving (13+14)	—374	—1,881	—1,889	—2,668	—323
16	Depreciation	120	130	145	165	195
17	Net saving (15—16)	494	2,011	2,034	2,833	518

¹ Includes grants to public bodies for public works, as follows (in millions of dollars): 9, 35, 124, 269, and 197.

fore be computed only from statistics of its expenditures and receipts. The difficulties that arise in computing saving are due almost entirely to the problem of classifying expenditures. Treasury statistics are kept on a cash basis; capital and current expenditures are not shown separately, and must be estimated from the classifications now being used. In such an attempt several difficulties are encountered. In the first place, the classification that seems most satisfactory, namely, that shown for the first time in Table 7 of the annual report of the Secretary of the Treasury for the year ending June 30, 1937, is available only on a fiscal year basis. Monthly statistics may be found in the special mid-month daily Treasury statement, but the classifications used there are not exactly the same as those used in Table 7 of the Secretary's annual report. For example, the item 'public works' as it appears in the daily Treasury statements is much more inclusive than the figure that appears in the annual report under the same heading. The second difficulty with the Treasury statement is that, although it makes possible computation on a calendar year basis, there have been many changes in classification since 1933, so that it is almost impossible to be absolutely certain of consistency in allocating expenditures between current and capital items. In view of the apparent superiority of the classifications in Table 7 of the Secretary's annual report, this table was used as a basis for the computations.

'Grants to public bodies, including administration', are included in capital outlays of the federal government. The expenditure of these funds by the states and localities is classified as capital outlay but our estimate of current receipts by the states and localities does not include them. Their inclusion in capital expenditures by the federal government therefore does not result in any overstatement of saving.

The final estimates are derived as follows:

1. *Total receipts.* From annual reports and daily statements of the Treasury.
2. *Capital receipts.* Includes proceeds from the sale of foreign securities, other proceeds of investments, and sales of government property. Data from annual reports and daily statements of the Treasury.

3. *Seignorage.* From annual reports and daily statements of the Treasury.

4. *Current receipts.* Item 1 minus items 2 and 3.

5. *Total expenditures.* From annual reports and daily statements of the Treasury.

6. *Expenditures on public works.* Corresponds to the figures shown on a fiscal year basis in Table 7 of the annual report of the Secretary of the Treasury. Experimentation with individual items in the daily Treasury statement revealed the composition of the public works in Table 7 (except for 'other public works') and thus made it possible to prepare figures on a calendar year basis, in accordance with Table 7 definitions. The item 'other public works' in Table 7 was apportioned for calendar years more or less arbitrarily since we did not know its composition.

7. *Loans.* Taken from annual reports and daily statements of the Treasury.

8. *Subscriptions to capital stock and paid-in surplus of government corporations and credit agencies.* Taken directly from the expenditures in the mid-month Treasury statements after being checked against the figures in Table 7 of the annual report.

9. *Debt retirement.* From annual reports and daily statements of the Treasury.

10. *Capital outlays of W.P.A., C.W.A., and C.C.C.* Some of the work done on these projects has taken a form that should be regarded as capital expenditure, such as construction of roads and bridges, but which is not classified as 'public works' under Table 7. It is impossible for us, with the information now available, to apportion these W.P.A., C.W.A., and C.C.C. expenditures accurately. Forty per cent of these expenditures have been regarded as capital outlays. The resulting estimate is lower, for the period as a whole, than the figures presented in the President's budget message of January 5, 1939.

11. *Total deductions.* Sum of items 6 through 10.

12. *Current expenditures.* Item 5 minus item 11.

13. *Gross saving.* Item 4 (current receipts) minus item 12 (current expenditures).

14. *Saving of trust funds.* Transfers to trust accounts and trust funds have been regarded as current cost of the federal government. Thus, expenditures accruing as saving to the benefi-

aries of the various accounts by the resulting increase in their equity have already been included in Table 1 under the heading 'Individual Saving in Liquid Form—Insurance and Pension Reserves' (see also Table III). Item 14 therefore includes only the increase in such minor trust accounts as are not included in Table 1.

15. *Total gross saving.* Sum of items 13 and 14.

16. *Depreciation.* See item X, 10.

17. *Net saving.* Item 15 (total gross saving) minus item 16 (depreciation).

Several items are omitted from this computation. Changes in supplies and inventories held by federal agencies are disregarded except so far as they appear in the insignificant item 'sales of government property'. In the War and immediate post-War years, this part of the government's assets changed considerably. It may be assumed, however, that no serious error is involved in neglecting this item during the years with which this study is concerned.

Discussion

I GERHARD COLM

I should like to raise a minor question in connection with Dr. Goldsmith's extremely careful and valuable estimates. Dr. Goldsmith interprets the increase in the social security funds of the federal government as individual saving (Sec. IV, 1; Ap. Table III). The fact that individual saving appears as the main positive contributor to the national net saving in recent years (Table 1) is partly due to this interpretation. Social security reserves do not fit naturally the usual classification into individual, business, and government saving. It seems to me that there are two possible methods of treating such reserves.

On the one hand, social insurance can be treated by analogy with private insurance. This is the procedure followed by Dr. Goldsmith. According to this analogy, the claims of individuals eligible to social security payments appear as individual saving. If the government holds an actuarially adequate reserve against these individual claims there is neither government saving nor dissaving. If the government plans to finance a part of later social security disbursements by later tax revenue this liability ought to be counted as negative saving. If, e.g., the old age insurance scheme should be shifted from the reserve system to the pay-as-you-go system, then individuals would still acquire the same claims, and thereby would show individual saving. Consequently, the government should be charged with negative saving of a corresponding amount. If this system is followed there seems no justification for including individual saving only to the amount accumulated in the government reserve; rather, the present value of all claims acquired should be counted as individual saving. The excess of this total sum of individual saving over reserves accumulated by the government should be posted as an item of negative saving. If this method were used I should prefer

to distinguish voluntary and compulsory saving and to regard the acquisition of social security claims as compulsory saving.

There is, however, another possible interpretation: old age insurance can be interpreted by analogy with old age assistance schemes. Individuals do not acquire legal claims on old age assistance. The introduction of old age assistance would thus not lead to individual saving and not necessitate the posting of corresponding negative saving by the government. Unemployment relief furnishes another example of the same sort. Were this analogy followed the claims acquired under the Social Security Act would not be regarded as individual saving and the corresponding liability would not be treated as negative government saving; rather, the accumulation of reserve funds would be treated as positive government saving.

It is not entirely arbitrary which interpretation should be chosen. We are interested in an interpretation that disturbs as little as possible the comparability of the estimates for the period before the enactment of the social security legislation and for the period after its enactment. If it were true that social security actually displaced chiefly private insurance and other private individual saving, it would be preferable to follow Dr. Goldsmith's method. I believe, however, that it is much more the function of social security to displace on a higher level relief and assistance schemes. If this is so, then it would be more appropriate to disregard the acquisition of individual claims and to treat the accumulation of funds as government saving.

II M. A. COPELAND

Dr. Goldsmith's treatment of saving is an important step forward in a field that has hitherto proved somewhat elusive. He is careful to state that his approach to the problem runs in terms of consolidated balance sheets and consolidated income accounts. He comes to the conclusion that saving may be measured as the sum of (a) the net increase in direct investments and net equities held by individuals (not counting capital gains), (b) additions to corporate surpluses, (c) additions to what may be called the residual equities of governments.¹

¹ He does not directly mention under (c) an item for churches and other non-profit institutions which corresponds to 'additions to the residual equities of governments'.

A memorandum recently prepared by the Committee of Statistical Experts of the League of Nations on *Statistics relating to Capital Formation* arrives at a substantially identical conception of saving and this, despite the fact that the idea of consolidated financial statements is certainly not explicit in the memorandum, and despite what seems a marked Robertsonian influence. This Robertsonian influence manifests itself in a suggestion that there is a time lag (and possibly a causal relationship) between saving so measured and replacement expenditures on the one hand and money outlay for the acquisition of new capital goods (investment) on the other. The memorandum explicitly states that saving plus replacement expenditures may not be equal to investment for short periods. In *Studies in Income and Wealth, Volume Two*. Professor Haberler, also following Professor Robertson, argues that for short periods saving and investment will not, in general, be equal. On the other hand, Dr. Goldsmith takes the position (which since Keynes' adoption of it has come to be called 'Keynesian') that I (net investment) equals S (saving). Dr. Warburton also appears to hold that estimates of investment should equal estimates of saving apart from differences in the bases of valuation, errors, omissions, and allowances for replacement and for international transactions. He has given an excellent statement of these sources of difference between estimates of saving and investment.²

I think it is probably true that those who take the position that investment equals saving (subject to the Warburton qualifications), have made the empirical significance of their conceptions of saving and investment clearer than have those in the Robertsonian tradition. Thus in *Volume Two*, I suggested that the various items that comprise 'investment' are increases in what an accountant would call the tangible assets on the consolidated balance sheet of the community and that the various items that comprise saving are increases in what an accountant would call the equities in these assets on the consolidated social balance sheet.³ Professor Haberler explicitly denies that the above meaning is the meaning usually attached to the two terms,⁴ but he offers

² *Volume One*, p. 102

³ *Volume Two*, p. 167

⁴ *Ibid.*, p. 186.

no example of an item that he or any other economist would regard as either saving or investment but that does not conform to my statement.

I propose to offer here an outline balance sheet set-up to illustrate the problem of measuring wealth, saving, and investment. This set-up agrees with Dr. Goldsmith and the League of Nations memorandum in the conceptions of saving and investment. It shows investment as an increase in assets, and saving as an increase in equities, as I suggested in *Volume Two* and as would be expected from Dr. Goldsmith's statement. I submit that it is difficult to understand how the authors of the League of Nations memorandum could ever have arrived at so nearly the same conception unless we assume that the idea of a consolidated financial statement of the community was somehow implicit in their thinking.⁵

Various assumptions will be made for simplicity in presenting the balance sheet set-up which follows. It is assumed, first, that we are dealing with an isolated economy. Second, we shall deal only with broad classes of asset and equity items; for many purposes, finer breakdowns might be desirable. These the reader can readily substitute in the balance sheet set-up. Third, it is assumed that all businesses are either (i) incorporated or (ii) conducted by individuals who do not separate their business from their personal accounts. Four types of entities are distinguished: (a) business corporations, (b) governments and other non-profit institutions, (c) individuals, (d) banks (including those government activities involved in the issuing of currency). Further differentiation among types of entities would complicate the argument but not affect its result for the present purpose. Finally, we shall assume that the balance sheet of each entity is first arranged in the appropriate form outlined below and that the various items on the balance sheets of all entities of each class are then

⁵ It might be argued that investment is a simple and natural concept representing merely the increase in wealth, so that no implication of consolidated financial statements is involved. But the notion of wealth itself, as Professor Irving Fisher clearly pointed out in *Capital and Income* in 1906, is dependent on the consolidated statement idea.

In this connection, it might be noted that the statement by Dr. Goldsmith in an earlier draft of his manuscript, that only tangible assets will appear on the community's consolidated balance sheet, is not strictly true. See below where an item 'special privileges' appears, and Sec II, 1 of Dr. Goldsmith's paper.

totalled to give us four total balance sheets which can be combined into a consolidated balance sheet for the economy as a whole.

ISOLATED ECONOMY

A. Business Corporations

1. Tangible assets (less valuation reserves)	11. Due to others
2. Special privileges (patents, trademarks, etc)	12. Stock (capital and surplus)
3. Cash and bank deposits	13. Subtotal
4. Net of adjustment items (n e c)	Less (5) Due from others
9. Total corporate wealth	And less (6) Stock in other corporations and banks
	19. Net total corporate equities

B Governments and Non-Profit Institutions

1. Tangible assets	11. Due to others
2. Cash and bank deposits	Less (3) Due from others
	And less (4) Stock in business corporations and banks
	Subtotal
	12. Residual equities
9. Total government and institutional wealth	19. Net total government and institutional equities

C. Individuals

1. Due from others	12. Net worth of individuals
2. Stock in business corporations and banks	
3. Cash and bank deposits	
Less (11) Due to others	
4. Subtotal (net investment in other parties' affairs)	
5. Special privileges	
6. Tangible assets	
9. Total	19. Total

D. Banks (including currency issuing agencies)

1. Monetary gold and silver stock	11. Total currency and deposit liabilities (less till money and interbank deposits)
2. Other tangible assets	12. Due to others
3. Due from others	13. Stock (capital, surplus and undivided profits)
	19. Total
9. Total	

NOTES 'Due to others' includes. (a) policy reserves for insurance corporations, (b) accrued charges payable, (c) deferred credits to income for payments received in advance, (d) bonds less bond discount unamortized, etc. 'Due from others' includes

the corresponding items on the creditors' books, 'Reserve for bad debts' is to be deducted from 'receivables'.

'Discrepancy in liability valuations' is defined as total due to others ($A_{11} + B_{11} + C_{11} + D_{12}$) minus total due from others ($A_5 + B_3 + C_1 + D_3$). This discrepancy may be a negative quantity.

'Discrepancy in stock valuations' is defined as total stock outstanding ($A_{12} + D_{13}$), less net of adjustment items (n.e.c.) (A_4) and less total stock held by all parties ($A_6 + B_4 + C_2$). This discrepancy may be a negative quantity. It is assumed that A_4 is chiefly 'deferred promotion and organization expense' and may be treated for convenience as if it were a kind of stock discount, so that $A_{12} - A_4$ in some sense equals the net book value of the proprietorship equity of corporations

E. Consolidated Balance Sheet of the Economy

- | | |
|--|---|
| 1. Monetary gold and silver stock (D_1) | 11. Residual equities of governments and non-profit institutions (B_{12}) |
| 2. Other tangible assets ($A_1 + B_1 + C_6 + D_2$) | 12. Net worth of individuals (C_{12}) |
| 3. Special privileges ($A_2 + C_5$) | 13. Discrepancy in liability valuations |
| | 14. Discrepancy in stock valuations |
| 9. Total wealth | 19. Total 'ultimate' equities |

We may assume that E_3 is small and that increments, apart from capital revaluations, may be neglected. E_{13} is almost certainly small enough to be neglected.

'Net new investment' may be defined as the net increase in $E_1 + E_2$, before any capital revaluations.

'Net saving' may be defined as the net increase in $E_{11} + E_{12} + E_{14}$, before capital revaluations. The increase in E_{14} may be approximated by 'net additions to surpluses of business corporations and banks'; so that saving equals 'individual saving' plus 'government saving' plus additions to surpluses of business corporations and banks.

It will be noted that these items correspond respectively to items (3) and (1) under Part II on page 11 of the League of Nations memorandum. This seems to substantiate the view that the consolidated balance sheet approach is implicit in the League of Nations memorandum.

The balance sheet approach has an important corollary for the view^a that currency and bank deposits account for differences in timing of movements of the items 'net saving' and 'net investment'. Since currency and bank deposits cancel out and do not appear on the consolidated balance sheet, it would seem that they cannot explain differences in movements of $E_1 + E_2$ on the one

^a See League of Nations memorandum, pp. 8 and 16.

hand and $E_{11} + E_{12} + E_{14}$ on the other. Moreover, the balance sheet approach casts grave doubt upon the existence of such a difference in timing, when the items are defined as on pages 11 ff. of the League of Nations memorandum. Indeed it provides a clear-cut way of defining I and S, according to which the equality between them is valid whatever the length of the time interval to which the measurements apply.

The balance sheet approach has one further important advantage. It provides several equations which make possible substitution of one group of items for another in making measurements. Since statistical data for several items that would help in measurements of saving are not available, this possibility of shifting from one set of items to another is particularly important.

I suggest that this balance sheet set-up might well replace the diagram on page 9 of the League of Nations memorandum. What is there referred to as Cross-section 2 would appear in this balance sheet set-up as an analysis of changes in some of the items that cancel out in the process of consolidation. Such an analysis is, of course, highly useful in revealing the processes of capital formation.

III E. L. DULLES

In commenting upon Dr. Goldsmith's paper, Dr. Colm questioned the classification of funds accumulated under the old-age insurance program as saving of individuals and suggested that these funds be grouped with government saving. The accounting procedure employed by Dr. Goldsmith is valid, and there is no question of double-counting (or under-counting) the old-age reserve funds in the total of national saving. The specific classification of these funds as individual saving, however, is open to question. There are many economic, as well as legal, aspects involved in the classification of these funds and no method of treating them is completely adequate. A more significant approach seems to be to classify the funds deposited in the reserve account as government saving. Several reasons for this conclusion may be indicated briefly.

First of all, the individual contributor to the old-age insurance program has no legal equity in the reserve account; that is, he

does not have to his credit an earmarked portion of the account, he cannot claim refunds of total contributions, nor can he borrow against accumulated funds. What the contributor actually has is a claim on the federal government for a benefit to be received at a future date and this benefit is subject to certain eligibility qualifications determined by social insurance principles which restrict payments to certain groups of contributors. Moreover, the lump-sum payment provision under the present act is even now being revised and the money-back principle replaced by current insurance protection.

Second, the reserve mechanism set up for old-age insurance does not necessarily reflect completely either amounts of contributions or accumulating benefit rights and it seems desirable to make the volume of individual savings independent of the financial policy of a particular government program. Legally, the claims to benefits are not dependent upon the financial structure of old-age insurance and benefits will be paid irrespective of the type of financial policy followed. If a reserve fund is not built up and 'saved' the government may have a larger burden to finance in the future because of the failure to make prior provision for a completely self-financed system. It is unthinkable, however, that the individual's claim to benefits would not be honored.

Still another consideration suggests that the reserve be classified as government saving. Although the deductions from consuming power or spending, resulting from contributions, gives some basis for counting them as saving by individuals, this is no more true of contributions for old-age insurance on a year-to-year basis than it is for tax payments generally. Furthermore, once contributions are paid, control of the accumulated funds is in the hands of the government, and the government directs the use of the funds into saving or consumption channels.

IV A. G. HART

Dr. Goldsmith's paper, so far as I am aware, is the first attempt to use for the analysis of saving the rich supply of new data that have been built up in the last few years. In consequence both of this better statistical foundation and of the extremely workman-

like procedure he has followed, Dr. Goldsmith's estimates for 1933-37 impress me as much more secure than any of the estimates for pre-depression years which make up the existing statistical literature on saving. Numerous details are open to revision—along lines I shall suggest in a moment—but I am confident that the general outlines of Dr. Goldsmith's results will prove unassailable.

One basic statistical limitation should be emphasized at the outset. As Dr. Goldsmith notes, the paucity of income and expenditure data for the upper income groups makes it necessary to estimate the saving of individuals by a method of balance-sheet comparison. But balance-sheet data also are unavailable, so far as direct data from individuals go. Their place is supplied by over-all figures obtained from the accounts of credit institutions, etc., supplemented by data on durable consumers' goods. For purposes of using global saving estimates as a rough check on investment estimates, or of determining the types of assets into which saving of individuals flow, this is not a fatal defect. But it leaves us helpless before fascinating puzzles such as the differences in saving habits of different income groups in different phases of the cycle. Dr. Goldsmith's list of needed improvements in the statistical material (IV, 3) should include sample income, expenditure, and balance-sheet data for individuals, by income groups, extending into the upper brackets.

Several rather important statistical details seem to me to call for adjustment, or at least exploration. In particular:

1. Estimates of the saving of local governments (Ap. Table X) seem to correspond roughly to the rise in their cash balances plus the shrinkage in their bonded debt, that is, to the shift toward creditorship in their visible debt position. Allowance should also be made, however, for the important invisible receivable item of accrued taxes, which doubtless fell appreciably in 1933-37 as delinquency was reduced. Some of the saving attributed to local governments should properly be ascribed to these taxpayers. As a partial offset, unpaid bills, salaries, etc., must have been reduced.

2. Estimates of bank deposits of individuals seem to me slightly out of line owing to an understatement of corporate balances (Ap Table I and point (7) in Sec. I of the Appendix).

The figures used for corporations are from corporation balance sheets. Checks in the mails between corporations have been deducted by senders, but not added to balances of prospective recipients; reciprocally, receivables are overreported by the same amount. For a method of adjustment see Currie and Krost's memorandum on the ownership of bank deposits and my *Debts and Recovery*, Table 9, note c (p. 297). Since it is only *differences* in these errors from year to year that affect Dr. Goldsmith's estimates, however, the net effect is probably very slight.

3. The treatment of deposits in closed banks (Ap. Table I-2) involves a valuation problem which seems to have been evaded. Presumably valuation at face value is excessive, as the fact the banks were closed implies losses. I should suggest valuation at 75 per cent of face value, for reasons indicated in *Debts and Recovery*, Table 6, notes h and j (p. 293). As to the proportion to be ascribed to individuals, the recently published study of failed banks by the F.D.I.C. may suggest revision.

4. The estimate of security holdings of non-individuals (Ap. Table IV-5) makes no allowance for shifts of corporate holdings outside the investment trust field, except for tax-exempts. I suspect that an appreciable amount of inter-corporate holdings may have been handed over to individuals during these years, though I can cite no direct evidence except a fall in figures for railroad bonds held by other railroads.

5. The net spread to catch changes in the debt position of 'individuals' (which, it must be remembered, includes unincorporated business, etc.) seems to me too wide-meshed. It allows only for debts secured by stock exchange collateral, real estate, automobiles, and other durable consumers' goods. But what of other individual short term debt? Business debts of unincorporated business to corporations and banks, unsecured bank loans of individuals, book credit of individuals with incorporated merchants, and 'personal loans' are important classes of debt which slip through the net. The only easy procedure I can suggest is a very audacious and risky residual method devised by Eugene Adams of the National City Bank. For 1933-35 this gives a cumulative shrinkage of individual short term debt of \$6.2 billion (see *Debts and Recovery*, Table 25, pp. 321-2), whereas

Dr. Goldsmith's estimate shows a growth of \$700 million in instalment debt and a shrinkage of \$644 million in security loans. It is possible, then, that some sizeable fish have escaped the net, though my residual estimate must be regarded as a statistical *tour de force* rather than a genuine measurement. The indicated remedy is an attempt to locate and measure the missing debt items. Incidentally, if such a search confirms my estimate, the gap between Dr. Goldsmith's savings estimates and Dr. Kuznets' figures for investment will be appreciably narrowed.

From the standpoint of the analyst interested in business fluctuations, Dr. Goldsmith's estimates illumine two very critical points. One is the astounding extent to which the private individual during the recovery period insisted on putting his saving into an improvement of his creditor position. The whole individual saving seems to have taken the form of bank deposits and insurance cash values, or if my finding on short term debts is accepted, the form of bank deposits, insurance cash values, and reduced short term debt. As Colm and Lehmann have pointed out in their *American Tax Policy*¹ and I in *Debts and Recovery*, this indicates a crucial 'qualitative' defect of the capital market, and may go far to explain the partial and incomplete nature of the recovery.²

The second salient fact is the extreme cyclical variability of total saving, much greater than that of individual saving. This should have been apparent from the instability of business saving. Plainly, individuals who are stockholders will not in general feel impelled to save more because their corporations have fallen on evil days and are paying dividends out of surplus, or because their corporations have failed to plow in any earnings. Probably many students of business cycles have long been conscious of this fact, which is plain enough once observed, but for me at least the evidence of a wide gulf between individual and total saving has proved most illuminating.

¹ Gerhard Colm and Fritz Lehmann, *Economic Consequences of Recent American Tax Policy*, Supplement 1 to *Social Research* (1938)

² Incidentally, there seem to be signs that this shift toward creditorship has been chiefly in the upper income groups, indicating a significant relative shift of position among classes, see *Debts and Recovery*, pp. 121-6

V WALTER SALANT

As a result of the great emphasis recent economic thought has placed upon the phenomena of saving and investment, statistical estimates of national saving such as those presented by Dr. Goldsmith attract a greater interest than ever before. They are being used not merely to measure how much income is devoted to capital formation but also to throw light on the movements and level of income itself. It is therefore timely to examine the statistics of saving to see whether they are appropriate to these new uses. In order to do so we must recall the meaning of saving and analyze more exactly just what there is about the process that makes it important in determining the flow of income.

Saving has been considered important in determining the flow of income because it has been regarded as primarily a negative process: a failure on the part of the saver to spend on consumption goods. If the saver does not spend his income on current output of capital goods, or if others do not purchase capital goods in an amount equal to his saving, the flow of income will be reduced. This version of the process, though strictly correct, can apparently beget unnecessary complications. So far as total income is concerned is there much use in distinguishing between expenditures on different kinds of current output? Income is earned in the production of goods and services whether they are capital goods or consumers' goods, durable or perishable.

1 THE DISTINCTION BETWEEN INVESTMENT AND CONSUMPTION EXPENDITURE

The reason for differentiating investment from consumption expenditure was and is still a good one, but it is necessary to remind ourselves what it is. So far as the theory of income and employment is concerned, it lies in the supposition that the motives to spend are different in the purchase of consumption goods and capital goods.

Consumers' goods yield direct utilities; capital goods are ordinarily thought of as desired for a money return, so that the

demand for them is supposed to reflect a nice estimate of expected costs and returns. Durable capital goods are supposed to become more or less attractive with changes in long term interest rates. We have been accustomed to think of consumption goods, on the other hand, as perishable and their purchases therefore as virtually unaffected by changes in the rate of interest. Thus, movements of interest rates will not cause changes in the one type of expenditure to be offset by opposite changes in the other.

There is another way in which investment and consumption expenditure are supposed to be significantly different. It is usually assumed that consumers' goods are purchased out of the current income of the purchaser, while capital goods are not ordinarily purchased out of current income or even out of funds acquired in the past, but are externally financed. Thus the saving and the purchase of capital goods are performed by different economic agents. It is thought that this fact makes it necessary to distinguish consumption from investment expenditure in analyzing changes in income. Because the saver is one agent and the purchaser of capital goods, a different one, it is thought that their expenditures are less likely to fluctuate in offsetting directions than if they were the same agent, since there is no efficient and automatic mechanism to produce the desired relation.

A study of actual capital expenditures and actual saving, however, leads one to wonder whether we may not be overdoing the distinction between investment and consumption expenditure and raising some unnecessary problems. The importance of durable consumer goods and public expenditures in our economy raises the question of classification. Are automobiles and radios to be considered consumption or investment goods? How much of the federal government's expenditures on work relief is to be considered capital expenditures? These and many similar problems must necessarily arise in connection with all estimates of saving and investment because the definition of the thing being measured is partly a matter of taste. Yet so far as the analysis of income is concerned, they are simply red herrings, having only a verbal significance. Obviously the real nature of the process by which income is generated does not depend upon definition.

A survey of expenditures ordinarily called 'capital' shows that a large fraction does not belong unambiguously in the investment

pigeonhole. Public construction, which amounted to 11 per cent of all expenditure on durable goods in 1919-37, is clearly investment expenditure according to any sensible definition, yet it has neither of the characteristics that justify the distinction for the purposes of monetary analysis. It is not undertaken for profit. Nor are rates of interest and other problems incidental to private external financing major considerations, except in the case of local government capital expenditures financed by borrowing.¹

Consumers' expenditures on passenger automobiles and durable household commodities constituted 37 per cent of total expenditure on durable commodities from 1919 to 1937. Except, perhaps, for the fraction purchased for commercial purposes the demand for these items does not reflect any fine calculation of utilities. The terms of credit, it is true, are important, since commodities of this type are so frequently sold on instalment. But it is the down payment that is of primary importance, i.e., the amount that will be lent, not the rate charged for it. Purchases of these commodities, furthermore, depend greatly on current income and the individual's prospects for the immediate future.

The capital formation of business is composed of the profit-making durable goods par excellence. It might be expected that expenditure on these goods would exhibit in full measure the characteristics associated with 'investment'. Yet in the fields of mining and manufacturing the facts seem to suggest that the most important determinants of a firm's capital expenditure are the level and direction of change of its current output. The rate of interest does not seem especially important, particularly for expenditures financed with a firm's own funds.² Expenditures financed in this way constitute the major part of capital formation by mining and manufacturing enterprises.

Only railroad and public utility capital expenditures exhibit the supposed characteristics of 'investment' in appreciable degree. Here we have the most durable capital equipment and the smallest proportion of self-financing. Yet even in these fields it

¹ It should be remembered that much public construction is not financed by borrowing at all.

² Although in pure theory interest rates should be as important in the disposition of undistributed earnings and previously acquired liquid funds as they are in determining borrowing, there seems little doubt that most firms do not calculate as closely when they can finance themselves.

is not certain whether capital expenditures are responsive to interest rates or whether their behavior in general differs appreciably from that of current expenditures.

Nor is there a clear-cut distinction between investment and consumption expenditures in their independence of or dependence on the level of income. The idea that investment demand (the 'marginal efficiency of capital') is independent of income is usually greatly exaggerated. We might class automobiles, furniture, radios, etc. as consumption goods and thus increase the accuracy of this idea to some degree.³ But the dependence of investment expenditures, even excluding those for durable consumers' goods, on the incomes of those who make them is still sufficiently great to make this a weaker ground for the distinction than has usually been supposed.

These problems of classifying expenditures are inevitable problems of definition in measuring saving and investment and are relevant to measurements of the composition of output or use of income. But the preceding comments suggest that they are not directly relevant at all in analyzing the level of total expenditure, income, and employment.

Some changes in saving and investment clearly should be disregarded when the statistics are being used in connection with such analysis: for example, shifts of expenditure between capital and consumption goods, such as might occur if people began to cut down their vacation expenditures in order to build homes.⁴ On the other hand, mere shifts in the disposition to save in particular forms do have direct effects on income even though they do not result in any shift of the disposition to save *in toto*. For example, a decision simply to 'put money in the bank' instead of buying a house would not affect the disposition to

³ If we include these goods in consumption expenditure it may be that the marginal propensity to consume exceeds unity for a certain range. An increase in income may induce people to increase their purchases of automobiles and radios by a greater amount, giving them the courage to borrow to finance the difference.

⁴ An illustration from actual events is afforded by the change in the federal government's expenditures from relief to public works. Such a shift produces an increase in saving and investment but has no direct effect on income. In Keynesian language, it is a fall in the propensity to consume which is exactly offset by increased investment.

save *in toto* but it would affect income.⁵ This is the sort of change that would be unnoticed by anyone who uses the ordinary statistics of total saving (although it would appear clearly in those of investment). It is the components of saving, as analyzed in the paper presented by Dr. Goldsmith, that are important in analysis.

I do not mention these difficulties of definition because they present real difficulties in the analysis of income and its changes. On the contrary, my purpose is to point out that they do not and that the appearance of difficulty where none exists suggests that the distinction between investment and consumption in the process of income-creation is perhaps overemphasized. This distinction is a simplification that is useful to us in learning to understand the process, but economists who have a firm grasp of the theory of income and employment should be able to lean less heavily on this distinction and proceed to the business in hand—the specific types of expenditure, who makes them, and what determines their amount.

2 THE DATA RELEVANT TO THE ANALYSIS OF INCOME

The conclusion that over-all saving statistics do not tell us precisely what we need to know for an analysis of the determinants of income would be accepted, I believe, by all who use the saving-investment analysis. The justification for using such statistics lies in the assumption that they are at any rate not *far* from what we really want to know. This is an hypothesis we can now test in a rough sort of way.⁶ Before elaborating on this statement, however, let us define what we want to know in the light of the foregoing observations.

Apparently what is relevant to the analysis of income is not the disposition of income as between current expenses (some of which, by the way, are merely book charges) and all other uses, but its disposition between actual expenditure on goods and services and all other uses. In other words, we want to know for the separate areas of the economy the behavior of the gap between income and income-creating disbursements of *all sorts* as income

⁵ Another example from the federal government is the cutting down of public works expenditures in the fiscal year 1938 without increasing other expenditures.

⁶ We could test it more accurately if we had a consolidated analysis of the uses of funds by corporations.

changes, not merely the gap between current income and *consumption* outlays.

Corresponding to the excess of income over income-creating disbursements in some economic areas there must be elsewhere in the economy a deficiency. The two discrepancies must be equal in the economy as a whole, just as saving and investment are equal. A reduction of expenditures on newly produced goods, whether capital or consumption goods, at one point in the economy will increase a positive discrepancy (or decrease a negative discrepancy) between income and income-creating disbursements at this point. But by reducing incomes it will increase the negative discrepancy (or decrease the positive discrepancy) elsewhere.

This formulation may be applied by subtracting from the saving figures the direct investment of savers and adding such current expenses as are merely bookkeeping charges. The remainder represents the increase in net claims (including money) held by the sectors of the economy under consideration.

On the other side of the picture, we may obtain the excess of income-creating disbursements over income by subtracting from the capital expenditures for each sector of the economy its saving and such current expenses as are merely bookkeeping charges. This remainder is the amount of income-creating disbursements financed by net sale of claims (including money).

This procedure is similar to the source and use of funds analysis except that it omits the funds raised by selling claims used to buy claims. For example, if the increased federal debt were exactly equal to the purchase of preferred stock (assuming the latter to be merely a 'capital-bolstering' expenditure) no discrepancy would arise.

In applying this formulation statistically it would, of course, be impossible to distinguish for any unit the purchase of goods actually produced during the period from the purchase of second hand goods, which creates no income. This presents no substantial difficulties for the economy as a whole, however, and even if it did we could surmount the difficulty by including in outlays the expenditure on all producible goods whether new or old, and including in income the receipts from the sale of all such goods, whether currently produced or not.

The analogy of this sort of measurement to that of saving and investment should not be pressed too far. It should be pointed out above all that its sole use would be in its application to particular sectors of the economy. Indeed, for a closed economy the sum of the discrepancies must be zero, since the increase in net claim liabilities (represented by the excess of income-creating disbursements over income) must be equal to the increased net holdings of claims (represented by the excess of incomes over income-creating disbursements).⁷

The procedure suggested could be of great value in studying the flow of income. The methods used in deriving the estimates presented by Dr. Goldsmith constitute the groundwork for such an analysis. By examining the propensity to increase net assets in non-producible forms we can get an idea of the amount of outside financing and sale of owned claims that is necessary to obtain given levels of income. By eliminating direct investment by savers this procedure is more appropriately pointed toward the problem of the financial markets. Perhaps more important is the fact that it focuses our attention on the relation between investment on the one hand and growth in debt and equity claims on the other. That a disposition to save large amounts at high levels of income requires large investment for prosperity is now generally accepted. It must sooner or later be realized also that in a community with a disposition to save *in the form of non-produced assets* the attainment of prosperity requires corresponding increases in debt ⁸ and equity claims outstanding.

VI R. W. GOLDSMITH AND WALTER SALANT

The points raised by Dr. Colm and Dr. Dulles really involve two questions:

⁷ In fact this measurement is in substance nothing but the difference between gross investment and gross saving for each of the main groups in the community and its algebraic sum must therefore be zero. The difference between investment and saving approximates very closely what Messrs. Krost and Currie call the 'net contribution to money incomes'.

⁸ Including money. The analysis would be significant for an understanding of the velocity of money so far as it threw light on the disposition to save in that form.

a) Is the saving done under the Social Security Act to be regarded as government or individual saving?

b) If it is to be regarded as individual saving, should it be measured by the increase in reserves or by the increase in the present value of individuals' claims to benefits under the Act, in which case it would have to be offset by government dissaving equal to the excess of the present value of claims over reserves?

If the saving performed under the Social Security Act is regarded as that of individuals, the question of how to measure it is not merely academic, since the increase in present value of benefit claims is not equal to the increase in reserve.¹ The reserve represents more nearly what individuals have paid. The difference between the reserve and the present value of the claims would, therefore, have to be regarded as a contribution by the government and, therefore, as dissaving by it if the total present value of claims is included in individual saving. If, instead, we measure the saving by growth of the reserves we are not really measuring the increase in individuals' equity. Also individuals' saving would be affected by Congressional appropriations for transfers to the Old Age Reserve Account. This seems to introduce an arbitrary element into individual saving. On the other hand, computation of the present value of claims must be based on the most hazardous assumptions. In short, as far as question (b) is concerned there are objections to both methods.

As both these treatments prove unsatisfactory it might be better to consolidate the trust accounts in question with the government's general accounts and to regard the increase in reserve as government saving. This method has the advantage of avoiding question (b). It would not involve the questionable computation of changes in the present value of claims nor would it imply any equality between Title 8 taxes and transfers to the Old Age Reserve Account, as does the reserve system when credited to individuals. Dr. Colm's point that individual saving before and after the Social Security Act are more nearly comparable when Social Security saving is not credited to individuals does have merit. Furthermore, individual saving can more legitimately be compared with the Department of Commerce series of

¹ See the report on the actuarial status of the Old Age Reserve Account contained in the Annual Report of the Secretary of the Treasury for 1938, p. 56.

'Income Payments to Individuals' when Social Security reserves are excluded from individual saving than when they are included. This is an important advantage when studying the relation of saving to income. Therefore, we are not inclined to object to the change Dr. Dulles and Dr. Colm have suggested.

Dr. Copeland is quite correct in saying that when all the balance sheets in the community are consolidated, the equity item is balanced not only by tangible assets but also by special privileges. Our statement on this subject has been corrected to take account of this minor complication.

Dr. Hart is, no doubt, right in saying that saving in the form of a reduction in tax arrears—now attributed by us to state and local governments—should properly be credited to individuals. The errors involved here affect only the distribution of saving and not the total figure because we do not take into account changes in either taxes receivable by governments or in taxes payable by individuals. Since we do not know how much of state and local tax receipts represents payment of accrued taxes, we do not know the amount that should be shifted to individuals.

The question of whether to correct for the understatement of corporate deposits and how to do so is complicated and fairly important since items in transit between depositors over the year-end probably changed by several hundred million dollars a year during the period. It may be considered on two planes. First, what procedure is best designed to make this figure itself correct, disregarding the possibility that there may be offsetting errors elsewhere that reduce the error in the total saving figure? Second, is the understatement of corporate deposits associated with any offsetting errors that would remain when the understatement is corrected, so that the correction would increase the error in the total saving figure?

Consider, first, the separate correction of our estimate for corporate deposits, for the moment ignoring deposits that belong to neither individuals nor corporations. The problem is to remove the overstatement of individual deposits that results from estimating them as the residual of total deposits taken from banks' balance sheets after insufficient deduction for corporate deposits. We might reduce the residual by deducting from the minuend (total deposits) the items in transit between depositors,

thus putting 'total deposits' on the basis of figures in the depositors' rather than the banks' books. Then when we subtract corporate deposits the residual for individuals is on the basis of their books. This downward adjustment is too great. The items in transit, instead of being credited to *either* the payer or recipient as they should be, are credited to neither. The result is an understatement of individual deposits, so far as this component is concerned. The amount of this understatement depends on whether we decide to credit these items to the payer or recipient. If we want to credit the payer, the understatement is equal to checks in transit written by individuals. If we want to credit the recipient it is equal to checks in transit written to the order of individuals. While either alternative presents very great difficulties when it comes to actual calculation, these difficulties seem somewhat smaller if the payer is credited.

A second way of reducing the residual is to add a correction to corporate deposits. Again it seems more practical to estimate the checks in transit written by corporations rather than those going to them. If this method is used, however, it must be remembered that some checks in transit are written by governments. If these are not to be credited to individuals they must be included in government deposits which also are deducted from total deposits in arriving at deposits of individuals.

Now let us consider our understatement of corporate deposits in conjunction with certain other errors and omissions Dr. Hart mentions. When in the future we attempt to estimate debts payable by individuals to corporations we shall probably have to resort to corporations' figures of accounts receivable and payable. These figures will overstate net items receivable just as they understate deposits because a corporation that has mailed a check and deducted the amount from its deposits will also have deducted it from its bills payable. The prospective recipient, not having received the check, will not add it to his deposits but neither will he have reduced his accounts receivable. Accordingly, any estimate of individuals' indebtedness to corporations that is based on corporate net accounts payable must take account of this error. Since it would exactly offset the present error in the deposit figures it might be best to leave the present overstatement

of individuals' deposits and to allow it to be offset by the overstatement of their indebtedness.

Dr. Hart's criticism concerning debts of individuals is justified in principle. We have probably missed an important volume of individuals' debts to business corporations and banks. Whether Dr. Hart's own attempt to estimate individuals' short term indebtedness is successful is difficult to say. Part of the reduction in debt undoubtedly reflects write-downs of bad debts which we want to eliminate. Part was probably offset by an increase in debts owed by individuals to non-reporting corporations such as government agencies, which seem to be neglected in Dr. Hart's computation. It seems doubtful that the net debt repayment we have omitted amounts to as much as \$6 billion. But we recognize the necessity for filling this gap.

Our estimate of the change in deposits in closed banks does not seem subject to Dr. Hart's criticism of excessive valuation. During 1935-37 the figure is almost entirely composed of actual payments made to depositors, and to a less extent, also in 1934 (Ap. Table I-2). Our estimate of the change in deposits does not and should not include losses suffered in the liquidation of deposits in closed banks. Losses do not involve dissaving as defined for our study; they are merely a writing down of assets. Dr. Hart's suggestion, as we understand it, would introduce a revaluation, which we have throughout tried to exclude.

The omission of a figure for net security purchase or sale balances of business corporations is a defect. The main source of information, the book value of non-tax-exempt securities as reported in *Statistics of Income*, seems affected to such a degree by revaluations and other extraneous factors as to be unusable. It may be possible, however, to compile a sample of corporate balance sheets that is less affected by these factors and will indicate the direction and order of magnitude of corporate transactions in outstanding securities.

Part Five

THREE ESTIMATES OF
THE VALUE OF THE NATION'S OUTPUT
OF COMMODITIES AND SERVICES
A COMPARISON

CLARK WARBURTON
FEDERAL DEPOSIT INSURANCE CORPORATION

Discussion

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CLARK WARBURTON

THREE ESTIMATES OF THE VALUE OF THE NATION'S OUTPUT OF COMMODITIES AND SERVICES A COMPARISON

CLARK WARBURTON

DURING the last five years the results of three extensive investigations of the value of the nation's output of commodities and services have been published. Since all three cover in considerable part the same field, it is desirable to compare their concepts and results. The first, launched in 1930, was conducted by W. H. Lough of Tradeways, Inc. and the results were published in 1935 in his *High-Level Consumption*. The most recently published, and by far the most elaborate, was conducted by Simon Kuznets of the National Bureau of Economic Research at the request of the Committee on Credit and Banking of the Social Science Research Council. Begun in 1933, the results were published in 1938 in two volumes: *National Income and Capital Formation, 1919-1935*, and *Commodity Flow and Capital Formation, Volume One*. The third was started in 1932 by the present author in connection with the Brookings Institution's investigation of the distribution of wealth and income in relation to economic progress. Two sets of estimates, one based on surveys of family expenditures and the other on census and trade data, were prepared for use in *America's Capacity to Consume*.¹ The estimates based on surveys of family expenditures were published in that volume, but the estimates based on census and trade data, which are more

¹ H. G. Moulton, Maurice Leven, and Clark Warburton (Brookings Institution, 1934).

reliable and more detailed, were deleted before publication by the senior author of the volume. Brief summaries of the estimates based on census and trade data were published in two articles in the *Journal of the American Statistical Association*.² The detailed estimates underlying the summary figures have not been published but have been available since 1934 in manuscript form and will be drawn upon in making comparisons with the results of the other two investigations.³

I Scope, Objectives, Categories, and Time Coverage

1 SCOPE AND OBJECTIVES OF THE THREE INVESTIGATIONS

The fields covered by these three investigations are closely related but by no means identical. Lough's investigation was directed primarily toward an analysis of consumption or consumer spending by the American people, with collateral attention to the savings of individuals and of the nation. Kuznets' investigation was concentrated upon capital formation. However, the process of measuring capital formation involved the preparation of estimates of the value of all kinds of commodities produced for consumption; and these estimates, together with National Bureau estimates of national income, were used to obtain estimates of the value of consumers' services not embodied in commodities. The objective of the author's estimates prepared for the Brookings Institution was to provide a summary of the utilization of the entire income of all the people of the nation, thus covering the value of both consumers' commodities and services and new capital equipment.⁴

² Clark Warburton, 'Value of the Gross National Product and its Components, 1919-29, *Journal of the American Statistical Association*, XXIX (December 1934), 383-8, and 'How the National Income was Spent, 1919-29', *ibid.* XXX (March 1935 supplement), 175-82. Some of the estimates were revised slightly in preparing the second of these articles. Both articles, using the revised figures, were included in a memorandum submitted in December 1934 to the Committee on Industry and Trade, Social Science Research Council. In this paper, references will be made to that memorandum, rather than to the two original articles in the *Journal of the American Statistical Association*.

³ The detailed estimates for 1929 are given in Tables 11 and 17 of this paper.

⁴ This is a statement of the objective of the present author's work, not of the larger investigation into wealth and income, of which it was a part.

2 CATEGORIES

In all three surveys consumers' outlay, or value of consumers' commodities and services, was segregated from savings or capital formation.⁵ However, the categories into which these two major segments of the nation's output were divided differ substantially, reflecting the differences in the objectives of the investigations.

In the National Bureau investigation primary emphasis was placed upon the durability of commodities; for this reason, the character of Kuznets' classification of consumers' outlay is entirely different from those of Lough and Warburton. The three sets of categories are compared in the accompanying summary.

KUZNETS	WARBURTON ⁶	LOUGH ⁷
Perishable commodities	Food and non-alcoholic beverages	Food and soft drinks
Semidurable commodities	Home maintenance	Home maintenance
Consumers' durable commodities	Attire	Clothing
Services not embodied in commodities (estimated only as a residual)	Transportation	Personal appearance
	Communication	Transportation
	Health and medical care	Sickness and death
	Protective and civil services	Social-cultural activities
	Education and reading matter	Direct taxes
	Social organizations	Recreation
	Recreation and art goods	Tobacco
	Stimulants	Alcoholic beverages and other illegal commodities

In the capital formation, or savings, segment of the nation's output, Kuznets' categories and those of Warburton in the estimate derived from census and trade data are similar. These sets of categories, however, differ decidedly from those of Lough and from those of Warburton in the estimate based on surveys of family expenditures. The differences arise because the former two sets of categories relate to the value of the various types of capital goods produced during the year, while the latter two sets relate to the amounts set aside by the people of the nation for acqui-

⁵ Kuznets' terminology is used in the text of this report to refer to concepts given different designations in the three investigations.

⁶ In the estimates prepared from surveys of family expenditures all categories except the first three were combined into a single category, 'other living'

⁷ The order of listing has been rearranged for more convenient comparison.

tion of property other than consumers' commodities and services. In all four sets of categories, shown in the accompanying outline, both gross and net totals are included, but the differences between gross and net totals also reflect the divergent character of the various sets of categories.

KUZNETS	WARBURTON (FROM CENSUS AND TRADE DATA)
<i>Gross capital formation</i> Consumers Residential construction Business Producers' durable commodities Business construction Changes in business inventories Public agencies Public construction Changes in stocks of silver and gold Unallocable Net changes in claims against foreign countries <i>Deductions to obtain net capital formation</i> Consumption of capital goods by Residential real estate Business Government	<i>Capital goods, gross value</i> Structures and equipment Residential buildings Commercial and industrial buildings Public and semi-public buildings Highways and streets Other transportation structures Public utility structures Machinery and equipment Miscellaneous construction Increase in inventories Increase in investment abroad <i>Deductions to obtain net value</i> Depreciation of structures and equipment
WARBURTON (FROM SURVEYS OF FAMILY AND INSTITUTIONAL EXPENDITURES)	LOUGH
<i>Savings amounts used for accumulation of assets by</i> Families and unattached individuals Business enterprises Social organizations (incl. governments) <i>Deductions to obtain net savings</i> Return to income flow Capital gains Insurance benefits Commissions, fraudulent securities, etc. Depreciation and depletion allowances Business enterprises Owner-occupied homes Public and semi-public structures and equipment	<i>Savings total annual acquisitions by consumers (natural persons)</i> Increases in cash holdings Payments for holdings of securities Payments of life insurance premiums Payments for holdings of real property <i>Deductions to obtain net savings of individuals</i> Realized profits and capital gains from sale of assets Receipts of funds withdrawn from life insurance companies

3 TIME COVERAGE

The periods covered by the three investigations are not identical, but overlap. Kuznets gives estimates for each year during 1919–35. The Lough survey covers the odd years during 1919–31 and also the two years 1909 and 1914. The Warburton estimates were confined to the odd years during 1919–29. In both Kuznets' and Warburton's estimates special emphasis was placed upon 1929 because of the greater availability of data for that year.

4 CATEGORY ADJUSTMENTS NECESSARY FOR COMPARISON

Direct comparison of the results of the three investigations is difficult because of the differences in major objectives and the corresponding differences in the categories used. In comparing the estimates relating to consumers' outlay it is necessary either to regroup the minor categories used by Kuznets into major groups similar to those used by Warburton and Lough, or to regroup the minor categories used by Lough and Warburton into the major groups used by Kuznets. Both methods of regrouping are used in the following comparisons.

The categories used in Kuznets' gross and net capital formation, and in Warburton's gross and net value of capital goods, can be adjusted for comparison. It is possible, also, to compare the net totals, and some of the items, in Lough's and Warburton's estimates of individuals' savings. These estimates of savings, however, can be compared with those of capital formation only by taking into account numerous differences between the dollar volume of savings and the amount of capital formation. This is a field in which estimates were prepared by only one of the three investigations.⁸

5 SCOPE AND FOCUS OF COMPARISONS MADE IN THIS PAPER

The comparisons in this paper relate to the estimates of the two major segments of the value of the national product, consumers' outlay and capital formation, and of their components. The estimates of savings, and the relation of savings to capital formation,

⁸ The present writer's estimates of the magnitude of these differences were given in his article, 'Value of the Gross National Product and Its Components, 1919–29', *op cit*, and in his paper in *Studies, Volume One, Part Two*, p. 109.

will not be considered. The comparison of the estimates of consumers' outlay and of capital formation will be focused upon the following questions:

1. How close is the agreement among the estimates when the items have been grouped into reasonably comparable categories?
2. To what degree are the differences among the estimates due to (a) minor differences of classification and of estimate, (b) significant differences in methodology and comprehensiveness?
3. What is the character of the significant differences in methodology and comprehensiveness?

Tables in the text of this paper include estimates solely for the odd years during 1919-31, since these are the only years covered by at least two of the three investigations. In Tables 9 and 10, however, appended to this paper, the various estimates for gross and net national product, consumers' outlay, and gross and net capital formation, are given for all years covered by the investigations.

The most comprehensive comparisons, those for the various types of commodities and services included in consumers' outlay, and in capital formation, are made for 1929 alone. The details of these estimates, and the reclassification and adjustments of the data to make them comparable, are given in Tables 11-18.

II Comparisons of the Three Sets of Estimates

Comparison of the results of the three investigations can be most conveniently made in several stages:

1. Totals for consumers' outlay and for gross and net capital formation for the odd years 1919-31.
2. Consumers' outlay, classified according to Kuznets' major categories, for the odd years 1919-31.
3. Consumers' outlay, classified according to Warburton's major categories, for 1929.
4. Gross and net capital formation in 1929, with sufficient reclassification to provide comparability.

1 TOTALS FOR CONSUMERS' OUTLAY AND FOR GROSS AND NET CAPITAL FORMATION

Kuznets' estimates of total consumers' outlay are presented only as three-year averages, but the figures for each year are readily derived by subtracting his estimates of gross capital formation from those for the value of the gross national product, or by subtracting those of net capital formation from those of national income.⁹ In Table 1 these estimates are compared with those of Warburton and Lough. Warburton's estimates, it will be noted, are consistently higher than Kuznets', the difference amounting to from \$10 billion to \$13 billion in five of the six years covered by both estimates, and to \$6 billion in the sixth year. Warburton's estimates range from 11 to 21 per cent higher than Kuznets'. Lough's estimates are also higher than Kuznets', but by smaller amounts.

⁹ In *National Income and Capital Formation* Kuznets states that differences in the assumption underlying the estimates of national income and those of net capital formation necessitate the use of three-year moving averages when comparing the latter with the former. Kuznets replied to my inquiry concerning the nature of these differences in assumptions as follows:

"The assumptions that are mentioned on p. 52 of *National Income and Capital Formation* are those made in deriving the two series of estimates and forced upon us by lack of specific data. For example, we assume that by and large the relative apportionment of certain commodity groups between finished and unfinished is at the 1929 levels throughout the period (in the measurement of capital formation); in measuring national income we make assumptions concerning income originating in some of the service industries and in the miscellaneous category that result in exceedingly crude measures (e.g., straight line interpolations between 1919 and 1929 of the number of people attached to an industrial division, which is then multiplied by an average income). It would be impossible to list all these assumptions since they are made at the numerous points in the study at which specific data needed are absent. By and large, I would say that the estimates of capital formation reflect more sensitively year-to-year changes than do the measures of national income. For a single year in which most of the Census data are available, such as 1929, the comparison can perhaps be drawn more closely."

Three-year moving averages smooth out the variations in the annual figures. I fail to see, however, how the assumptions mentioned by Kuznets 'necessitate' the use of three-year moving averages, or make three-year moving averages any more reliable than the estimates for each year.

TABLE 1
ESTIMATES OF CONSUMERS' OUTLAY
(billions of dollars)

	TOTAL CONSUMERS' OUTLAY ¹				AMOUNT GREATER (+) OR LESS (—) THAN KUZNETS	
	Warburton (census and trade data)		Warburton (expenditure surveys)		Warburton ²	Lough
	Kuznets	Lough				
1931	56.3	59.5				+3.2
1929	73.3	80.1	83.0		+12.0	+6.8
1927	68.6	80.3	79.4		+11.7	+4.3
1925	64.2	77.2	68.7	77.0	+13.0	+4.5
1923	60.0	71.6	62.4	69.5	+11.6	+2.4
1921	54.7	60.9	52.5	57.9	+6.2	—2.2
1919	49.4	59.6	56.5	59.2	+10.2	+7.1

¹ For sources of estimates, see Table 9. ² Estimate based on census and trade data

In Table 2 Kuznets' and Warburton's estimates of gross and net capital formation are compared. Greater differences between the estimates occur in the case of gross capital formation than in the case of net capital formation. For gross capital formation,

TABLE 2
ESTIMATES OF GROSS AND NET CAPITAL FORMATION ¹
(billions of dollars)

	GROSS		NET		AMOUNT WARBURTON GREATER (+) OR LESS (—) THAN KUZNETS	
	CAPITAL FORMATION		CAPITAL FORMATION		Gross	Net
	Kuznets	Warburton	Kuznets	Warburton		
1929	20.3	17.8	10.1	9.7	—2.5	—0.4
1927	18.2	16.6	8.9	9.2	—1.6	+0.3
1925	19.2	20.4	10.6	13.6	+1.2	+3.0
1923	18.2	16.8	9.7	10.5	—1.4	+0.8
1921	11.5	4.3	3.7	—1.5	—7.2	—5.2
1919	19.3	20.7	10.5	15.1	+1.4	+4.6

¹ For sources of estimates, see Table 9

Warburton's estimates range from \$1.2 billion (or 6 per cent) more than Kuznets' estimates in 1925 to \$7.2 billion (or 63 per cent) less than Kuznets' estimates in 1921. With respect to net capital formation, the differences in 1927 and 1929 are relatively small. In 1925 and in 1919 Warburton's estimates are 28 and 44 per cent higher, respectively, than Kuznets'. In 1921 Warburton's estimate is negative while Kuznets' is positive.

2 CONSUMERS' OUTLAY FOR PERISHABLE COMMODITIES, SEMIDURABLE AND DURABLE COMMODITIES, AND SERVICES

In Table 3 are given the three estimates of consumers' outlay, classified in the three categories: (1) perishable commodities, (2) semidurable and durable commodities, (3) services not embodied in commodities. For this table the minor commodity and service groups used in the Lough and Warburton estimates have been regrouped as closely as possible along the lines of demarcation followed by Kuznets. Separation of the semidurable from the durable commodities has not seemed feasible, in view of the character of the Lough and Warburton minor categories; for this reason these two categories of Kuznets have been combined.

In the case of perishable commodities, Warburton's estimates are higher than Kuznets', the difference ranging from \$3.1 to \$3.9 billion, except in 1921, for which year the two estimates are the same. Lough's estimates are fairly close to Kuznets' but are slightly higher in most years. On the average, Warburton's estimates for perishable commodities are 12 per cent, and Lough's estimates 2 per cent, higher than Kuznets'.

In the case of semidurable and durable commodities, both Warburton's and Lough's estimates are consistently lower than Kuznets': Warburton's estimates ranging from \$1.2 to \$2.4 billion, and Lough's from \$1.7 to \$2.7 billion, less than Kuznets'. On the average, Warburton's estimates for semidurable and durable commodities are 9 per cent, and Lough's estimates 11 per cent, lower than Kuznets'.

These contrary tendencies suggest that some commodities classified as semidurable or durable by Kuznets may have been placed among perishable commodities in the Warburton estimate. Careful inspection of the items, however, indicates that this is not a significant factor. The differences in the perishable commodities are due primarily to the inclusion of an estimate for the value of alcoholic beverages in Warburton's estimates but not in Kuznets'. The difference between the two estimates of the value of semidurable and durable commodities is due chiefly to the differences in the percentages of sales of automobiles, tires and tubes, and auto accessories assumed to have been purchased by individuals and by business enterprises respectively.

TABLE 3

ESTIMATES OF CONSUMERS' OUTLAY FOR PERISHABLE COMMODITIES,
SEMIDURABLE AND DURABLE COMMODITIES, AND SERVICES¹

(billions of dollars)

	KUZNETS	WARBURTON	LOUGH	AMOUNT GREATER (+) OR LESS (—) THAN KUZNETS	
				Warburton	Lough
<i>Perishable commodities</i>					
1931	21.5		20.6		—0.9
1929	28.6	32.3	29.3	+3.7	+0.7
1927	26.7	30.6	27.1	+3.9	+0.4
1925	25.4	28.9	26.3	+3.5	+0.9
1923	23.0	26.5	24.2	+3.5	+1.2
1921	22.0	22.0	21.2	0.0	—0.8
1919	24.6	27.6	25.9	+3.0	+1.3
<i>Semidurable and durable commodities</i>					
1931	14.8		12.9		—1.9
1929	22.3	20.0	20.0	—2.3	—2.3
1927	20.9	18.5	18.6	—2.4	—2.3
1925	20.4	18.4	18.5	—2.0	—1.9
1923	19.3	18.1	17.5	—1.2	—1.8
1921	15.3	13.2	13.6	—2.1	—1.7
1919	16.4	15.9	13.7	—0.5	—2.7
<i>Services not embodied in commodities</i>					
1931	20.0		26.0		+6.0
1929	22.5	33.0	30.8	+10.5	+8.3
1927	21.0	31.2	27.2	+10.2	+6.2
1925	18.4	29.9	24.0	+11.5	+5.6
1923	17.8	27.0	20.7	+9.2	+2.9
1921	17.3	25.7	17.8	+8.4	+0.5
1919	8.3	16.1	16.9	+7.8	+8.6

¹ For sources of estimates, see Table 10.

In the case of services not embodied in commodities, both Lough's and Warburton's estimates are far larger than Kuznets'. Warburton's estimates range from \$7.8 to \$11.5 billion (or from 47 to 94 per cent) higher than Kuznets'. Lough's estimates range from \$0.5 to \$8.6 billion more than Kuznets'. One reason for these differences in the estimated value of consumers' services is the treatment of government expenditures. Kuznets and Lough use methods of estimation that evaluate government services to consumers, such as education and medical care, at the amount of direct taxes paid by individuals. Warburton uses a cost method of evaluation. This difference in the treatment of government

services to consumers is an important, but not dominating, cause of the difference between the Kuznets and Warburton estimates. If the difference in the treatment of government services is eliminated, the Lough and Warburton estimates for consumers' outlay on services, in 1929, are both approximately \$8 billion (or 35 per cent) larger than Kuznets'. The differences for other years, after elimination of the divergent modes of handling government services, cannot be stated as precisely, but are of comparable magnitude.

3 CONSUMERS' OUTLAY FOR VARIOUS TYPES OF COMMODITIES AND SERVICES

When consumers' outlay is classified according to the types of goods and services purchased, Kuznets' estimates can be compared in detail with those of Warburton and Lough for 1929 alone and only with respect to commodities. The comparison cannot be made for other years because Kuznets' adjustments of manufacturers' values for trade margins are made by minor commodity groups for 1929 alone. For other years these adjustments are made by major groups: perishable, semidurable, and durable commodities. Detailed comparisons can be made only for commodities because Kuznets' estimate of the value of consumers' services is obtained as a residual between national income on the one hand and the outlay for commodities (consumers' commodities plus net capital formation) on the other, with no estimates of the constituent elements in consumers' services.

In Table 4 the Kuznets and Lough estimates of consumers' outlay in 1929 are reclassified to conform as nearly as possible to the categories used by Warburton, and estimates are given, so far as possible, of the amounts spent by consumers for the various kinds of commodities and services.

The Kuznets, Warburton, and Lough estimates of the total value of consumers' outlay for commodities are fairly close, in view of the differences in methodology used in their preparation. Warburton's estimate is about 3 per cent above, and Lough's about 3 per cent below, Kuznets'. However, if alcoholic beverages and other illegal commodities, which Kuznets excludes, are deducted from Warburton's and Lough's estimates, they are 5 and 7 per cent below Kuznets', respectively.

TABLE 4
CONSUMERS' OUTLAY FOR MAJOR TYPES OF GOODS
AND SERVICES, 1929
(billions of dollars)

	Kuznets	COMMODITIES AND SERVICES		
		Warburton ¹ (census and trade data)	Lough ²	Warburton ³ (expenditure surveys)
<i>Total consumers' outlay</i>	73.3	85.3	80.1	83.0
Food and non-alcoholic beverages		20.1	19.5	21.1
Home maintenance		22.4	22.2	22.5
Attire	Not	13.7	12.2	11.6
Transportation	avail-	8.1	9.2	} 27.8
Communication	able	0.9	1.4	
Health and medical care		3.6	2.9	
Protective and civil services		1.7	{ 3.1	
Education and reading		3.6		
Social organizations		1.5	2.2	
Recreation and art goods		3.7	3.5	
Stimulants		6.2	3.8	

¹ Based on census and trade data, see Tables 11 and 12.

² See Tables 13 and 14.

When the estimates for the various types of commodities are examined, several are found to be reasonably close. The three estimates of the cost of food, amounting respectively to \$19.4, \$19.9, and \$19.5 billion, are remarkably similar. For home maintenance Warburton's and Lough's estimates are somewhat lower than Kuznets', owing to more conservative evaluations of purchases of furniture and other household equipment. For attire, Kuznets' and Warburton's estimates are almost identical, with Lough's somewhat lower. For the other items, except transportation and stimulants, the three estimates are in substantial agreement. As already noted, the differences among the estimates for stimulants (a category that includes tobacco, alcoholic beverages, narcotics, and chewing gum) is due to the omission of alcoholic beverages from Kuznets' estimate and to a lower evaluation of alcoholic beverages and narcotics by Lough than by Warburton.

The most important difference among these estimates of consumers' outlay for commodities occurs in the case of transportation, for which the Kuznets, Warburton, and Lough estimates amount, respectively, to \$6.6, \$4.5, and \$5.5 billion. These dif-

COMMODITIES			SERVICES		
Kuznets ⁴	Warburton ¹	Lough ²	Kuznets	Warburton ¹	Lough ²
50.8	52.3	49.3	22.4	33.0	30.8
19.4	19.9	19.5		0.2	
7.6	6.9	7.0		15.5	15.2
11.9	11.9	10.5		1.7	1.7
6.6	4.5	5.5	Not	3.6	3.7
0.4	0.3	0.5	avail-	0.6	0.9
0.9	0.8	0.7	able	2.7	2.2
0.2	0.2	{ 1.0		1.5	{ 2.1
1.0	0.7			2.9	
				1.5	2.2
0.7	0.8	0.7		2.8	2.8
2.1	6.2	3.8			

¹ Warburton, *Memorandum to Committee on Industry and Trade*, Social Science Research Council, December 1934.

⁴ See Tables 15 and 16.

ferences, as indicated in Table 5, are accounted for primarily by differences in judgment concerning the proportions of the total production of automobiles, tires and tubes, and auto parts and accessories that should be allocated to consumers' outlay. Kuznets allocated all passenger automobiles, Warburton two-thirds, and Lough 85 per cent, to consumers' outlay. The three allocations for tires are, respectively, 78, 37, and 60 per cent, and those for auto parts and accessories 21, 8, and 30 per cent.

The differences among the results of the three investigations with respect to the value of consumers' outlay on services are primarily due, as noted, to two important differences in methodology: (1) Kuznets and Lough evaluate government services to consumers without specific charge at the amount of taxes collected directly from individuals, while Warburton evaluates these services by estimating their cost; ¹⁰ (2) Kuznets evaluates

¹⁰ Kuznets' methodology in *Commodity Flow and Capital Formation, Volume One*, and *National Income and Capital Formation* is such as to make unnecessary in those volumes an explicit statement that this method of evaluating government services to consumers is used. However, in *Studies, Volume One*, p. 237, and *Volume Two*, pp. 292-5, Kuznets states that this method is used.

TABLE 5

ESTIMATES OF TOTAL COST OF TRANSPORTATION COMMODITIES,
AND AMOUNTS ALLOCATED TO CONSUMERS' OUTLAY, 1929

	RETAIL VALUE OF TOTAL PRODUCTION ¹			PERCENTAGE ALLOCA- TION TO CONSUMERS			CONSUMERS' OUTLAY		
	Kuz- nets (billions of dollars)	War- burton (billions of dollars)	Lough (billions of dollars)	Kuz- nets	War- burton	Lough	Kuz- nets (billions of dollars)	War- burton (billions of dollars)	Lough (billions of dollars)
<i>Commodities, total</i>	11 0	10 2	9 5	60	44	58	6 6	4 5	5 5
Passenger autos	3 4	3 2	3 2	100	67	85	3 4	2 2	2 7
Gasoline	2 5	3 0	{ 3 0	62	50	50	1 5	1 5	{ 1 5
Lubricating oils	0 7	0 4 ²		28	50 ²	50	0 2	0 2	
Tires and tubes	0 9	1 1	0 9	78	37	60	0 7	0 4	0 5
Auto parts and accessories	3 5	2 5	2 4	21	8	30	0 7	0 2	0 7
Misc. vehicles ³							0 1		0 1

¹ Computed in part by stepping up the value of consumers' outlay on the basis of percentage allocations to consumers. In the case of Kuznets' estimates, it has been assumed that trade margins for these items are the same as the average for the minor commodity group in which they are classified

² Total sales at retail only, rather than value of total production

³ Neither retail value of total production nor percentage allocation to consumers can be obtained from data in the respective sources. Consumers' outlay, in the Warburton estimate, is less than \$50 million

total consumers' outlay for services as the residual between his estimates of national income and of the outlay (consumers' outlay plus net capital formation) for commodities. The first of these two differences in methodology accounts for about one-third, and the second, for about two-thirds, of the total difference between the Kuznets and Warburton estimates.

The margin of error in Kuznets' evaluation of consumers' outlay for services is probably larger than in Warburton's and Lough's. This is because Kuznets' estimate, obtained as a residual, reflects all the errors of estimate in the value of commodities and also those in the National Bureau estimates of national income. If some commodities, such as automobiles, are overvalued in consumers' outlay, and if the national income estimates are somewhat too low as indicators of the sum of consumers' outlay and the value of capital formation, substantial errors might be accumulated in the residual that Kuznets uses as an estimate of the value of consumers' services not embodied in commodities.

TABLE 6
ESTIMATES OF CONSUMERS' OUTLAY FOR SERVICES, 1929
(billions of dollars)

	DERIVED FROM KUZNETS ¹	WAR- BURTON ²	LOUGH ³
<i>Total value of services not embodied in commodities</i>	22.5	33.0	30.8
Rental value of dwellings	9.8-11.7	11.9	11.2
Domestic service	2.1	1.0	1.9
Government services to individuals	1.2-1.8	4.9	1.2
Other services	9.4-6.9	15.2	16.5
Home maintenance (incl. hotel and room rentals; water, gas, and electricity; garbage and snow removal; repairs and storage)		2.6	2.1
Attire (incl. laundry and dry cleaning; jewelry, watch, and shoe repairing; dressmakers', milliners', and tailors' services; barbering and hairdressing)		1.7	1.7
Transportation (incl. railroad, streetcar, bus, ferry, airplane, and taxicab fares; insurance, storage, and repair of automobiles; moving and expressage)		3.2	3.7
Communication (postal, telephone, and telegraph service)		0.6	0.9
Health and medical care		2.3	2.2
Protective and civil services (incl. mortuary services, fees, fines, and legal services)		0.3	{ 0.9
Education and reading		0.4	
Social organizations		1.5	2.2
Recreation and art goods (incl. motion pictures, theatres, and other commercial amusements, camps, licenses, park fees; tourist travel abroad)		2.7	2.8

¹ Total value of services: see Table 10.

Rental value of dwellings³: first estimate, Kuznets, *Commodity Flow and Capital Formation, Volume One*, p. 340 (\$9.1 billion increased by \$0.7 billion to cover rental value of farm dwellings), second estimate, Fabricant, *Capital Consumption and Adjustment*, pp. 142, 144, and 146.

Domestic service: estimate prepared under Kuznets' supervision for the Department of Commerce, *National Income, 1929-32*, Senate Doc. 124, 73d Cong., 2d Sess., p. 151 (nurses excl.).

Government services to individuals: first estimate, Lough, *High-Level Consumption*, p. 246; second estimate, Warburton, unpublished ms. (see Table 12, footnote 1)

¹) No estimate of the amount of taxes collected from individuals prepared by Kuznets or his associates is available.

Other services: residual.

² See Table 12.

³ Rental value of dwellings and domestic service: Lough, *High-Level Consumption*, p. 242. Other items: see Table 14.

In order to show as clearly as possible the effect of Kuznets' residual method of measuring the value of consumers' services, the present author has taken the liberty of pushing this method one stage farther than Kuznets does in *National Income and Capital Formation*. In Table 6 the Kuznets, Warburton, and Lough estimates of consumers' outlay for services are divided into four parts: (1) rental value of dwellings, (2) domestic service, (3) value of government services rendered to individuals without specific charge, (4) other services not embodied in commodities.

The estimates of the rental value of dwellings and of consumers' outlay for domestic service in Table 6, column headed 'Derived from Kuznets', were prepared by Kuznets or his associates. No estimate prepared by Kuznets of the amount of taxes collected directly from individuals is available, but it is unlikely that his estimate would differ greatly from the range indicated by those of Lough and Warburton. The residual figure for 'other services' is, in consequence, a fair approximation to Kuznets' estimate of consumers' outlay for services other than dwellings, domestic service, and those received from government. This figure indicates that Kuznets evaluates all consumers' services—except dwellings, domestic, and government services—at about half or two-thirds the evaluations made by Warburton and Lough by direct estimation. In order to indicate the wide range of services included in his figures, they are itemized and the Warburton and Lough estimates for the various groups given in the table.

4 GROSS AND NET CAPITAL FORMATION

The Kuznets and Warburton estimates of gross and net capital formation in 1929, with sufficient reclassification of items to make comparisons possible, are given in Table 7. Warburton's estimate of gross capital formation is \$2.5 billion (or 12 per cent) smaller than Kuznets'; but Warburton's estimate of net capital formation is only \$0.4 billion (or 4 per cent) smaller than Kuznets'. These net results are due to several important differences between the two estimates, chiefly (a) a 10 per cent higher evaluation of new structures by Warburton than by Kuznets; (b) a 14 per cent lower evaluation of new machinery and equipment by Warburton than by Kuznets; (c) a 20 per cent smaller estimate of

TABLE 7
ESTIMATES OF GROSS AND NET CAPITAL FORMATION, 1929
(billions of dollars)

	KUZNETS	WARBURTON
<i>Gross capital formation</i>	20.3	17.8
<i>Net capital formation</i>	10.1	9.7
<i>Items evaluated on gross basis</i>		
(structures and equipment), total	17.4	17.4
Residential buildings	3.0	3.5
Public structures	2.9	2.6
Business structures, other than for transportation and public utility concerns	2.6	2.8
Transportation and public utility structures	2.0	2.8
Machinery and equipment	6.5	5.7
Farm livestock (gross increase)	0.4	
<i>Items evaluated on net basis, total</i>	2.8	0.3
Change in business inventories	2.4	0.1
Change in stocks of silver and gold	0.1	
Change in investment abroad	0.3	0.2
<i>Capital consumption, total</i>	10.2	8.1
Residences	2.5	1.8
Public properties	0.6	0.9
Business properties	7.1	5.4

SOURCE: see Table 18.

capital consumption by Warburton than by Kuznets; (d) a very much lower estimate of net change in business inventories by Warburton than by Kuznets (\$0.1 billion as compared with \$2.4 billion).

The differences in evaluation of new structures and equipment, combined with the differences in estimates of capital consumption, produce rather striking differences between the Kuznets and Warburton estimates with respect to net capital formation originating in residential construction, public construction, and business structures and equipment, respectively (Table 8). These divergent estimates of gross and net capital formation are the composite result of several differences in methodology and technique, the more important of which are listed below.

1. The differences in evaluation of new structures seem to be due primarily to a larger allowance by Warburton than by Kuznets for construction in 11 states not covered by the Dodge

TABLE 8
ESTIMATES OF GROSS AND NET VALUE OF VARIOUS TYPES OF
CAPITAL FORMATION, 1929
(billions of dollars)

	VALUE OF NEW STRUCTURES AND EQUIPMENT		CAPITAL CONSUMPTION		NET CAPITAL FORMATION	
	WAR- KUZNETS	BURTON	WAR- KUZNETS	BURTON	KUZNETS	WAR- BURTON
<i>All structures and equipment</i>	17.4	17.4	10.2	8.1	8.2	9.3
Residences	3.0	3.5	2.5	1.8	0.5	1.7
Public structures	2.9	2.6	0.6	0.9	2.3	1.7
Business structures	4.6	5.6	7.1	5.4	4.4	5.9
Machinery and equipment	6.5	5.7				
Farm livestock	0.4					
<i>Other capital formation</i>					2.8	0.3
Business inventories					2.4	0.1
Stocks of silver and gold					0.1	
Investment abroad					0.3	0.2

Service, and to the use by Kuznets of data not available at the time the Warburton estimates were prepared.

2. The difference in the value of new machinery and equipment is primarily due to the inclusion in Kuznets' estimate of items from the Census of Manufactures omitted from Warburton's estimate, either inadvertently or because they were assumed to be used as materials by other manufacturing establishments.

3. Kuznets makes specific allowance for the gross increase in capital livestock on farms and a corresponding allowance (a nearly identical amount) in capital consumption for gross decrease in value; while Warburton includes only the net change in value along with other farm animals in farm inventories.

4. Kuznets includes depletion in his estimate of capital consumption, while Warburton does not.

5. Warburton makes a larger allowance for depreciation on public properties than Kuznets; both estimates are highly arbitrary.

6. Kuznets adjusts his depreciation estimates for price changes, on the assumption that replacement costs are higher

than the book values of structures and equipment used by business concerns in handling their depreciation accounts. The actual reduction in capital values on account of depreciation, according to Kuznets, is considerably higher than the depreciation allowances claimed by business concerns in preparing their income tax returns.

7. Kuznets also adjusts his evaluation of the net increase in inventories for price change during the year, on the assumption that the practice of evaluating inventories at cost or market, whichever is lower, causes the business evaluations of inventories to be out of line with the evaluation of similar types of goods sold.

8. Kuznets estimates that inventories of concerns engaged in trade increased approximately \$0.4 billion (as reckoned by the concerns in their accounting—that is, prior to the adjustment for price changes mentioned above), while Warburton estimates that the inventories of these concerns decreased by this amount. This contrary result arises because Kuznets estimated total inventories of concerns engaged in trade from estimated total sales and sample data on inventory-sales ratios; while Warburton assumed that changes in inventories of unincorporated concerns engaged in trade were similar, in proportion to the volume of business done, to changes in inventories of corporations engaged in trade, and furthermore, that about 20 per cent of the entire volume of trade had shifted from unincorporated to incorporated concerns during 1919–29, with one-tenth of this shift occurring during 1929.

III Conclusion

In conclusion I should like to make a few general observations regarding evaluation of the nation's output of commodities and services.

1. In general, Warburton's and Lough's evaluations of the cost of specific commodities to ultimate consumers are more conservative than Kuznets'. The larger totals for consumers' outlay obtained by Warburton and Lough are due to (a) more inclusive coverage, (b) direct estimation rather than use of a residual figure in evaluating consumers' services, (c) in the case of War-

burton, the use of the cost instead of the direct tax basis of evaluating government services.

2. Estimation of the value of consumers' outlay for services as the residual between estimates of national income and of the value of commodities is decidedly unreliable, whether used in the form of annual figures or three-year moving averages.

3. The total value of consumers' outlay for commodities and services, plus the net value of capital formation, when the more conservative evaluations of the separate items are used but all items are separately estimated, is several billion dollars larger than the estimates of national income prepared by the Department of Commerce and the National Bureau of Economic Research. A careful analysis of the reasons for this difference is needed.

4. A new comprehensive investigation of the value of the nation's output of commodities and services is urgently needed, at least for recent years, including 1929. In such an investigation, the cost to final consumers of each item or each minor group should be separately estimated for each year. That is, trade margins should be estimated in connection with each item or minor group, rather than by broad groups such as perishable and durable commodities, and no group should be evaluated as a residual. By including 1929 in such a study, the best techniques and evaluations developed by the three investigations discussed in this paper can be used.

TABLE 9

ESTIMATES OF THE VALUE OF THE NATIONAL PRODUCT AND ITS MAJOR COMPONENTS
(millions of dollars)

	GROSS NA- TIONAL PRODUCT		CONSUMERS' OUTLAY			GROSS CAPITAL FORMATION		CAPITAL CONSUMPTION		NET CAPITAL FORMATION		NET NATIONAL PRODUCT OR NATIONAL INCOME		
	Kuz- nets ¹	War- bur- ton ²	Kuznets ³	Warbur- ton ² (Cen- sus)	Lough ⁴	Warbur- ton ² (Surveys)	Kuz- nets ⁵	Warbur- ton ²	War- bur- ton ²	Kuznets ⁶	War- bur- ton ²	Kuznets ¹	Warbur- ton ²	
1935	61,243		52,235				9,008		8,208		800		53,035	
1934	55,765		49,704				6,061		7,916		—1,855		47,849	
1933	46,538		42,270				4,268		7,255		—2,987		39,283	
1932	47,202		44,055				3,147		7,574		—4,427		39,628	
1931	64,751		56,287		59,544		8,464		8,742		—278		56,010	
1930	82,723		69,061				13,662		9,783		3,879		72,940	
1929	93,640	103,125	73,342	85,317	80,070	83,000	20,298	17,808	10,216	8,075	10,082	9,733	83,424	95,050
1928	90,053		72,229				17,824		9,656		8,168		80,397	
1927	86,778	96,912	68,570	80,267	72,947	79,400	18,208	16,645	9,349	7,445	8,859	9,200	77,429	89,467
1926	88,780		69,743				19,037		9,303		9,734		79,477	
1925	83,413	97,619	64,202	77,189	68,703	77,000	19,211	20,430	8,567	6,840	10,644	13,590	74,846	90,779
1924	78,791		63,546				15,245		8,422		6,823		70,369	
1923	78,214	88,437	60,015	71,616	62,358	69,500	18,199	16,821	8,508	6,274	9,691	10,547	69,706	82,163
1922	67,186		53,904				13,282		7,480		5,802		59,706	
1921	66,148	65,167	54,660	60,870	52,531	57,900	11,488	4,297	7,805	5,822	3,683	—1,525	58,343	59,345

THREE ESTIMATES OF OUTPUT

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TABLE 9—Cont

ESTIMATES OF THE VALUE OF THE NATIONAL PRODUCT AND ITS MAJOR COMPONENTS
(millions of dollars)

	GROSS NA- TIONAL PRODUCT		CONSUMER'S OUTLAY			GROSS CAPITAL FORMATION		CAPITAL CONSUMPTION	NET CAPITAL FORMATION	NET NATIONAL PRODUCT OR NATIONAL INCOME				
	Kuz- nets ¹	War- bur- ton ²	Warbur- ton ² (Cen- sus)		Lough ⁴	Warbur- ton ² (Surveys)	Kuz- nets ⁵	Warbur- ton ²	Kuznets ⁶ ton ²	War- bur- ton ²	Kuznets ¹	Warbur- ton ²		
			Kuznets ³											
1920	82,836		60,736				22,100		10,450		11,650	72,386		
1919	68,750	80,291	49,409	59,614	56,490	59,200	19,341	20,677	8,824	5,531	10,517	15,146	59,926	74,760
1914					30,619									
1909					26,343									

¹ *National Income and Capital Formation*, p. 24

² *Memorandum to Committee on Industry and Trade*, Social Science Research Council, December 1, 1934. Estimates in column marked 'Census' based on Census and trade data (for details and method, see Table 11). Estimates in column marked 'Surveys' based on surveys of family expenditures (for method see Ap. B, *America's Capacity to Consume*), supplemented by estimated utilization of life insurance benefits, expenditures of governments for services to persons and for capital purposes, and expenditures of endowed institutions and business enterprises (from undistributed income) for capital purposes and for consumers' goods and services

³ Value of gross national product minus gross capital formation, see footnotes 1 and 5

⁴ *High-Level Consumption*, pp. 236 and 246 (total consumers' spendings and withholdings, minus savings)

⁵ *National Income and Capital Formation*, p. 40, Variant I.

⁶ *Commodity Flow and Capital Formation, Volume One*, p. 494

TABLE 10
ESTIMATES OF CONSUMERS' OUTLAY FOR COMMODITIES AND SERVICES
(millions of dollars)

	TOTAL CONSUMERS' OUTLAY ¹			TOTAL FOR COMMODITIES			PERISHABLE COMMODITIES			SEMIDURABLE AND DURABLE COMMODITIES			SERVICES		
	Kuz- nets	Warbur- ton	Lough	Kuz- nets ²	Warbur- ton ³	Lough ⁴	Kuz- nets ²	Warbur- ton ³	Lough ⁴	Kuz- nets ²	Warbur- ton ³	Lough ⁴	Kuz- nets ⁵	Warbur- ton ³	Lough ⁴
1935	52,235			37,164			23,095			14,069			15,071		
1934	49,704			32,954			20,756			12,198			16,750		
1933	42,270			28,528			18,133			10,395			13,742		
1932	44,055			28,675			18,147			10,528			15,380		
1931	56,288		59,544	36,253		33,549	21,481		20,644	14,772		12,905	20,035		25,995
1930	69,061			44,676			26,395			18,281			24,385		
1929	73,342	85,317	80,070	50,845	52,301	49,243	28,550	32,290	29,259	22,295	20,011	19,984	22,497	33,016	30,827
1928	72,229			48,715			27,348			21,367			23,514		
1927	68,570	80,267	72,947	47,594	49,100	45,707	26,672	30,600	27,106	20,902	18,500	18,601	20,976	31,200	27,241
1926	69,743			48,469			27,107			21,362			21,274		
1925	64,202	77,189	68,703	45,821	47,300	44,734	25,404	28,900	26,272	20,417	18,400	18,462	18,381	29,900	23,971
1924	63,546			42,385			23,750			18,635			21,161		
1923	60,015	71,616	62,358	42,234	44,600	41,674	22,967	26,500	24,173	19,267	18,100	17,501	17,781	27,000	20,683
1922	53,904			37,614			21,410			16,204			16,290		
1921	54,660	60,870	52,531	37,353	35,200	34,768	22,047	22,000	21,187	15,306	13,200	13,581	17,307	25,700	17,763
1920	60,736			46,355			27,278			19,077			14,381		
1919	49,409	59,614	56,490	41,084	43,500	39,553	24,646	27,600	25,898	16,438	15,900	13,655	8,325	16,100	16,939
1914			30,619			20,503			13,959			6,544			10,116
1909			26,343			17,366			11,711			5,655			8,977

¹ For sources, see notes to Table 9.

² Kuznets, *Commodity Flow and Capital Formation, Volume One*, p 478 (items I-1, II-1, and III-1)

³ For 1929, see Table 12. Other years estimated from index numbers based on sample data.

⁴ For 1929, see Table 14. Estimates for other years obtained by the same method

⁵ Total consumers' outlay minus total for commodities

THREE ESTIMATES OF OUTPUT

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TABLE 11
WARBURTON'S ESTIMATES OF THE VALUE OF CONSUMERS' GOODS AND SERVICES, 1929
(from unpublished manuscript)

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE 1
<i>All Consumers' Goods and Services</i>	85,317	
FOOD AND NON-ALCOHOLIC BEVERAGES, TOTAL	20,055	
<i>Meat, total</i>	4,422	
Beef (4,998 million lb. at \$ 326)	1,629	Consumption 80% of carcass weight, B A I. Price B L S., B H E., B A E quotations, weighted for importance of various cuts and for consumption on farms, in villages and cities
Veal (657 million lb. at \$ 322)	212	Consumption 80% of carcass weight, B A I. Price 98 7% of price of beef, based on wholesale price relationships at Chicago, B L S.
Mutton and lamb (562 million lb. at \$ 245)	138	Consumption and price same as beef
Pork (excl. lard) (7,069 million lb. at \$ 269)	2,092	Consumption and price same as beef
Value added by curing	203	Computed from difference between manufacturers' value of cured meat and of equivalent amount of fresh meat, Census of Manufactures.
Edible organs, other fresh meat, misc. meat products	148	Manufacturers' value, adj. for exports, imports, and trade margin (wholesale 12%, retail 25%)
<i>Dairy products, total</i>	4,195	
Whole milk (19,912 million qt. at \$ 12)	2,389	Consumption B A E, adj. for amount used in bakeries and confectionery manufacturing. Cream is included on whole milk basis and also butter made and used on farms, incl. some milk used in making ice cream. Price B L S. quotations and price received by farmers for milk sold at retail, B A E
Butter (1,966 million lb. at \$ 50)	983	Consumption. Census of Manufactures, adj. for exports, imports, increase in storage, and farm production sold. Butter produced and used on farms not incl. (see whole milk)
Cheese (563 million lb. at \$ 34)	191	Consumption B A E. Price B L S., B H E., B A E. quotations, weighted according to production of various types
Evaporated and condensed milk (1,600 million lb. at \$ 115)	184	Consumption Census of Manufactures, case goods only, adj. for exports and imports. Price B L S., B H E. quotations, and manufacturers' value and trade margin.

Ice cream (1,120 million qt. at \$40)	448	Consumption. Census of Manufactures Additional production (total estimated by B A E. at 365 million gal) assumed to be covered by retail value of milk (see whole milk). Price manufacturers' value, plus one-third.	THREE ESTIMATES OF OUTPUT
<i>Other proteins and fats, total</i>	2,772		
Canned and cured fish and sea food	176	Manufacturers' value, adj. for imports, exports, changes in stocks, and trade margin (wholesale 12%, retail 25%).	
Fresh fish and sea food (1,215 million lb. at \$ 15)	182	Consumption: Bureau of Fisheries (10 lb. per capita). Price author's estimate.	
Poultry			
Chickens (2,561 million lb at \$ 30)	768	Consumption: no of chickens raised (Census of Agriculture) and assumed average dressed weight of 4 lb., adj. for increase in farm flocks, exports, imports, and increase in storage. Price: B L S. quotations and farm value, weighted for consumption on farms, in villages and cities.	
Other poultry	95	Computed from ratio of farm value to farm value of chickens sold.	
Eggs (2,532 million doz. at \$ 38)	962	Consumption: eggs produced on farms (Census of Agriculture), adj. for use in hatching, exports, imports, and increase in storage. Price: B L S. quotations and price received by farmers, weighted for consumption on farms, in villages and cities.	
Lard (1,457 million lb. at \$ 18)	262	Consumption: B.A.I , adj for bakery use Price: B.L S., B A.E.	
Shortenings and vegetable cooking oils (1,468 million lb. at \$.165)	242	Consumption Census of Manufactures, adj. for exports and bakery use Price estimated from ratio of manufacturers' value to that of lard.	
Oleomargarine (353 million lb. at \$ 24)	85	Consumption: withdrawals from storage, Commissioner of Internal Revenue. Price B L S , B H E	343
<i>Cereals and bakery products, total</i>	2,626		
Bread, rolls, coffee cake (9,864 million lb. at \$ 09)	888	Consumption Census of Manufactures Price B L S , B H.E., B A E quotations.	
Biscuits, crackers, cookies, pretzels (1,387 million lb at \$ 26)	361	Consumption: Census of Manufactures, adj. for exports and imports. Price. Census of Manufactures, adj. for exports and trade margin (wholesale 12%, retail 25%).	
Soft cake, pies, misc. bakery products	460	Manufacturers' value, adj for trade margin (retail 35%)	

TABLE 11—*Cont*

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
<i>Cereals and bakery products, Cont</i>		
Wheat flour (54 million bbl. at \$9 00)	486	Consumption total consumption, Department of Commerce, adj. for use in bakeries and manufacturing Price B L S , B H E , B A E quotations
Corn meal and ground flour	132	Manufacturers' value, adj for exports and trade margin (wholesale and retail, 40%)
Breakfast foods	170	Manufacturers' value, adj for trade margin (wholesale and retail, 40%)
Macaroni, spaghetti, vermicelli, noodles	66	Manufacturers' value, adj for trade margin (wholesale and retail, 40%)
Rice (701 million lb. at \$09)	63	Consumption Department of Commerce Price B L S , B H E , B A E quotations
<i>Vegetables, fruits, nuts, total</i>	3,220	
Canned and dried vegetables	476	Manufacturers' value, adj for exports, imports, and trade margin (wholesale 12%, retail 25%).
Irish potatoes (332 million bu. at \$1 35)	448	Consumption. estimated at half the production during 1928 and 1929, adj for net imports and non-human consumption (one-fifth of total) Price B L S , B A E quotations, weighted for consumption on farms, in villages and cities.
Other fresh vegetables purchased	507	Value of truck crops and of sweet potatoes sold by farmers, B A E , adj for sales to canners and processors, and trade margin (100% of farm value)
Farm and village gardens	341	Value of farm gardens and of truck crops and sweet potatoes used by farm families, B A E , plus \$75 million for village gardens.
Citrus fruits	409	Consumption production of 1928, B A E , adj for exports and imports Price B L S , B H E retail quotations, B L S wholesale quotations, auction prices and import values, B A E Fruits incl oranges, grapefruit, lemons, limes

Tropical and semi-tropical fruits (except citrus)	150	Consumption: net imports of bananas and pineapples and imports and production of dates and figs. Price of bananas; B.L.S., B.H.E., B.A.E. quotations. Value of other fruits estimated at twice the import value.
Other fresh fruits purchased	472	Estimated from farm cash income from all fruits, adj. for income from citrus fruits, exports, imports, sales to canners and other processors, and trade margin (100% of farm value).
Canned and dried fruits	212	Manufacturers' value, adj. for exports, imports, and trade margin (wholesale 12%, retail 25%).
Nuts	205	Consumption: Department of Commerce. Average retail price: 15¢ per lb for peanuts, 40¢ for other nuts.
<i>Sugar, confectionery, condiments, non-alcoholic beverages, total</i>	3,057	
Cane and beet sugar (9,160 million lb. at \$.065)	595	Consumption: U. S. Beet Sugar Association, adj. for use in manufacturing (incl. illicit liquor production). Price: B.L.S., B.H.E., B.A.E. quotations
Other sugars, syrups, prepared desserts	148	Incl. honey, maple sugar and syrup, sweetening syrups and molasses, desserts ready to mix, pie and cake fillings, prepared dessert powders, cane syrup, corn starch. Values of honey and maple sugar based on farm values and sales, plus trade margin; of other products, on manufacturers' values, plus trade margin (50%).
Confectionery	676	Manufacturers' value, excl. salted nuts and incl. sweet and milk chocolate, adj. for exports, imports, and trade margin (wholesale 17%, retail 50%).
Soft drinks	443	Manufacturers' value, adj. for exports, imports, and trade margin (wholesale 30%, retail 50%) Items incl carbonated beverages, cereal beverages, still beverages, grape juice, malted milk.
Coffee, tea, cocoa, coffee substitutes	556	Consumption: coffee, 1,161 million lb., amount roasted and ground, Census of Manufactures, adj. for imports and exports; tea, 88 million lb., net imports, coffee substitutes, 15 million lb., Department of Commerce Price: coffee, \$.43 per lb.; tea \$.70 per lb., B.L.S., B.H.E., B.A.E. quotations, coffee substitutes, \$.25 per lb. Value of powdered cocoa estimated at 50% above manufacturers' value.
Condiments	215	Manufacturers' value, adj. for sales to industrial consumers (salt), imports, exports, and trade margin (50%) Items incl salt, spices, flavoring extracts, chili pepper.

TABLE 11—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
<i>Sugar, confectionery, condiments, non-alcoholic beverages, Cont</i>		
Pickles, preserves, jams, and jellies	260	Manufacturers' value, adj for trade margin (40%) Items incl : canned pickles, sauces and salad dressing, canned preserves, jams, jellies, fruit butter, mincemeat.
Foreign and misc. food preparations	74	Manufacturers' value, adj for trade margin (25%). Items incl : Italian, Spanish, and Mexican food preparations, 'health foods', misc food products.
Cooking aids	90	Manufacturers' value, adj. for trade margin (75%) Items incl : yeast and baking powder, vinegar and cider, refined bicarbonate of soda, cream of tartar.
<i>Industrial use not allowed for in the separate items</i>	—1,323	Derived from estimate of total purchases of semi-manufactures by food manufacturers, less amounts deducted in estimates for specific items of food.
<i>Restaurant mark-up above retail value</i>	925	Gross margin of restaurants, estimated at 45% of value of meals sold, adj for estimated proportion of food purchased at less than retail prices
<i>Home preparation (professional cooks only)</i>	161	Estimated from no. not in hotels, restaurants, etc, Census of Occupations, and assumed average annual earnings of \$500
HOME MAINTENANCE, TOTAL	22,356	
<i>Rentals, total</i>	13,081	
Rented nonfarm dwellings (12,352,000)	4,829	Census of Families, 1930, cases where rent was not reported prorated among the various groups Assumed that rentals re- ported in April 1930 were representative of the year 1929 More than half a million dwellings, with tenure unknown, omitted from this and the following estimates
Rental value of owned nonfarm dwellings (10,503,000)	6,338	Census of Families, cases where value was not reported prorated among the various groups. Rental values in 1929 assumed to be 10% of the reported value of dwellings in April 1930.
Rental value of farm dwellings (6,605,000)	708	Estimated at 10% of reported value of farm dwellings, Census of Agriculture

Rooms in hotels	289	One-half of net receipts from rooms, Censuses of Hotels and of Retail Distribution.
Rooms in private and lodging houses (net)	746	Gross annual rental paid by lodgers estimated at \$200 per lodger, amounting to \$1,086 million. From this, \$85 per room deducted to cover proportion of house rental and other costs of home maintenance for lodgers in private dwellings (estimated at 4 million rooms).
Quarters furnished by institutions, army and navy	171	Estimated at \$100 for each resident of institution and each person in military and naval vessels, Census of Families.
<i>House equipment and decoration, total</i>	<i>4,702</i>	
Household furniture	1,011	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale one-third, retail 60%).
Operating equipment		
Cooking and heating	317	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 25%, retail 43%).
Lighting	215	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 27%, retail 82%).
Refrigerating	162	Two-thirds of value of domestic refrigerators, estimated from manufacturers' value, adj. for trade margin (wholesale and retail, 60%).
Sewing and washing machines	172	Manufacturers' value, adj. for trade margin (wholesale and retail, 60%).
Electrical appliances, not elsewhere included	110	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 29%, retail 82%).
Pianos, phonographs, radios	761	Manufacturers' value, adj. for sales to industrial consumers, exports, and trade margin (wholesale 18%, retail 56%).
Furnishings and decorations		
Floor coverings, draperies, curtains	558	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (60-80%).
Mattresses, bed springs, bed linens, covering	396	
Kitchen and table ware, table coverings, etc.	509	
Towels, bathroom and misc. equipment	254	
Paints and varnishes	237	

TABLE 11—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
<i>Household supplies and operation, total Supplies</i>	4,573 665	Manufacturers' value, adj for sales to industrial consumers and trade margin. Items incl mosquito netting, matches, paper napkins, toilet paper, waxed paper, tissue paper, cleaning and polishing preparations, blacking stains and dressing, bluing, borax, sal soda, household insecticides and disinfectants, household soaps, dyes, needles, pins, brooms, brushes
Fuel and light		
Coal	795	Retail sales less 20% allowance for sales to apartment houses, stores, and small industrial users
Fuel, oil, wood, etc.	305	55% of refiners' sales of fuel oil, Census of Manufactures, adj. for trade margin, plus value of wood used by farmers, B A E
Gas	546	American Gas Association.
Electricity	619	National Electric Light Association, <i>Electrical World</i> , January 2, 1932.
Illuminating oils and candles	304	Manufacturers' value, adj for sales to industrial consumers and trade margin.
Water, ice, garbage removal		
Water	300	Three-fourths of estimated total water charges for domestic use. Total based on median domestic rates and median per capita consumption in 325 cities in 1925, <i>Municipal Index, 1926</i> , with 60% assumed to be domestic, and on revenue receipts of municipally operated water supply systems in 207 cities
Ice	126	Manufacturers' value, adj for sales to industrial consumers and trade margin
Garbage removal, etc.	50	Arbitrary estimate, supported by frequency of item in family expenditure accounts
Domestic service	863	No of gainfully employed, Census of Occupations, and assumed average earnings housekeepers and stewards, \$600, servants, \$450, laborers, \$600 laundrerers and laundresses, \$350

ATTIRE, TOTAL	13,669
<i>Clothing and shoes, ready-to-wear, total</i>	<i>8,582</i>
Men's and youths' clothing	
Suits, trousers, coats, etc.	905
Overcoats, raincoats, leather, sport clothing	315
Work clothing, costumes, uniforms, misc. outer garments	256
Shirts, neckwear, hosiery, handkerchiefs, garters, suspenders	689
Underwear, nightwear, bathrobes, lounging garments	218
Headwear	200
Footwear (excl. rubber)	594
Women's and misses' clothing	
Dresses, suits, ensembles, shirts, blouses, daytime pajamas	1,397
Coats and raincoats	736
Smocks, aprons, uniforms	53
Hosiery, garters, scarfs, neckwear, handkerchiefs	699
Underwear, nightwear, corsets, bathrobes, kimonos	458
Headwear	324
Footwear (excl. rubber)	731
Clothing, not classified by sex	
Sweaters, bathing suits, belts, misc. knit goods	236
Gloves and mittens	114
Footwear, chiefly rubber	181
Children's and infants' clothing	476
 <i>Clothing materials and making, total</i>	 <i>2,272</i>
Cotton goods	612
Silk and rayon goods	691
Woolen goods	435
Misc. items	269

Total value of clothing and shoes, ready-to-wear, estimated from manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 16%, retail 50%). Values for various items estimated from ratio between manufacturers' value for each category to manufacturers' value for all clothing and shoes, ready-to-wear. The figure for each item is, of course, less reliable than the figure for all clothing and shoes, ready-to-wear, because of the varying proportion sold to industrial consumers, exported or imported, and varying trade margins

Total value of materials (cotton, silk, rayon, woolen, misc. items) estimated from manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 20%, retail 35%). Values for the various items estimated from ratio of manufacturers' value for each category to manufacturers' value for the total

TABLE 11—Cont.

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
<i>Clothing materials and making, Cont</i>		
Services of dressmakers, milliners, tailors	265	Estimated from no engaged, Census of Occupations, and assumed average earnings dressmakers and seamstresses (not in factory), \$800, milliners and millinery dealers, \$800, dressmakers and milliners' apprentices, \$500; tailors and tailoresses (half of total no), \$1,200
<i>Jewelry and other articles of apparel, total</i>	730	
Precious stones and jewelry	382	Manufacturers' value, adj. for sales to industrial consumers, imports, exports, and trade margin (wholesale and retail, 85%).
Watches, pocketbooks, umbrellas, canes, etc.	348	Manufacturers' value, adj. for sales to industrial consumers, imports, exports, and trade margin (wholesale and retail, 85%).
<i>Care of clothing and apparel, total</i>	958	
Dry cleaning, laundry, pressing	733	Census of Manufactures, excl commercial work, with a small adjustment for margin on business done on wholesale basis and an arbitrary adjustment of \$100 million for hand laundries and tailor shops not covered by the Census.
Shoe repairing	92	Estimated from no of shoemakers and cobblers not in factories, Census of Occupations, and assumed average earnings, incl materials supplied and overhead costs, of \$1,200.
Jewelry and watch repairing	41	Estimated from no of jewelers and watchmakers not in factories, Census of Occupations, and apprentices, and assumed average earnings, incl materials supplied and overhead costs, of \$1,500 for jewelers and watchmakers, and \$500 for apprentices
Luggage	92	Manufacturers' value, adj. for sales to industrial consumers, and trade margin (wholesale and retail, 75%)
PERSONAL CARE, TOTAL	1,127	
Barbering and hairdressing	591	Total compensation of employees and entrepreneurs, <i>National Income, 1929-32</i> , increased 10% for overhead costs

Cosmetics, perfumes, misc. toilet preparations	339
Toilet soaps, combs, razors, blades, etc.	197
TRANSPORTATION, TOTAL	8,122
<i>Vehicles purchased, total</i>	<i>2,203</i>
Automobiles	2,160
Other vehicles	43
<i>Maintenance of motor vehicles, total</i>	<i>3,276</i>
Gasoline	1,485
Oils and greases	208
Tires, tubes, accessories	603
Repairs and storage	454
Taxes and registration fees	248
Insurance	278
<i>Common carrier transportation, total</i>	<i>1,987</i>
Steam railroads (incl. Pullman)	479
Electric railways	816
Motor buses	316

Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 35%, retail 43%).
Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 35%, retail 43%).

Two-thirds of new passenger car sales, estimated from sales of automobile sales rooms, Census of Retail Distribution, state reports, and sales of wholesale trade at retail, Census of Wholesale Distribution, U. S. Summary.

Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (80%). Items incl: aircraft, carriages, buggies and sulkies, sleighs and bobs, bicycles, motorcycles, motor boats under 5 tons, sailboats, rowboats, canoes

Half of cost of gasoline, estimated from (a) consumption by motor vehicles, 14,177 million gal., Bureau of Public Roads estimate, (b) average retail price of 17 9¢ a gal. without tax, American Petroleum Institute, (c) state gasoline taxes, \$431 million.

Estimated at 16.4% of cost of gasoline, excl tax, Census of Retail Distribution, U. S. Summary, percentage sales of filling stations.

Census of Manufactures, adj. for sales to industrial consumers and trade margin (wholesale one-third, retail 43%); half of total incl

Half of receipts from automotive repairs and storage, Census of Retail Distribution, U. S. Summary.

Half of registration fees, personal property and municipal taxes, National Automobile Chamber of Commerce

Half of total cost of automobile insurance, National Automobile Chamber of Commerce

Half of passenger revenue, Railway Statistics, I C C

Nine-tenths of passenger revenue, American Transit Association, *Transit Journal*, January 1933

Four-fifths of passenger revenue, National Association of Motor Bus Operators, *Bus Facts for 1931*

TABLE 11—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
<i>Common carrier transportation, Cont</i>		
Taxicabs	263	Three-fourths of estimated gross revenue based on an estimate of 100,000 taxicabs in operation, reports of National Automobile Chamber of Commerce as to no. in leading cities, and an assumed average gross income, incl tips, of \$3,500 per car per year
Coastal and inland waterways	106	No. of passengers carried, at an assumed average fare of 5¢ for ferries and \$1.00 for excursion and regular passengers. Annual reports of the Chief of Engineers, U. S. Army, to the Secretary of War.
Airways	7	Half of passenger revenue, estimated from no. of passengers carried and fares paid, adj. for passengers carried in 'misc. flying operations', <i>Air Commerce Bulletin</i> , May 1, 1933.
Maintenance of highways and streets	456	Half of total cost, U. S. Department of Commerce, Bureau of the Census, <i>Financial Statistics of States, 1929</i> , and <i>Financial Statistics of Cities, 1929</i> , and estimate of expenditures by places under 30,000 population based on reports of 8 states.
Moving and expressage	200	Fragmentary data—volume of business of chief long distance moving concerns and traffic surveys covering movement of household goods.
COMMUNICATION, TOTAL	935	
Correspondence	290	Two-thirds of retail sales, estimated from manufacturers' value, adj. for sales to industrial consumers and trade margin (wholesale one-third, retail 61%). Items incl. writing paper, envelopes, ink, stationery goods, pencils, pens, portable typewriters.
Postal service	200	One-third of postal revenue from stamps, postal cards, etc., box rents, and money orders.
Telephone service	403	One-third of operating revenue of all telephone companies (total operating revenue estimated by American Telephone and Telegraph Company).
Telegraph, cable, wireless	42	One-fifth of operating revenue (total operating revenue from <i>Statistical Abstract of the United States</i>).

HEALTH AND MEDICAL CARE, TOTAL	3,556
Physicians and surgeons	1,090
Dentists	445
Other curative professions and semi-professions	193
Nurses on private duty	202
Hospital and laboratory service	659
Public health and organized medical services	150
Health goods and appliances	152
Drugs and medicines	665
PROTECTIVE AND CIVIL SERVICES, TOTAL	1,652
Administration of government	522
Protection (military and police)	553
Sanitation	140
Mortuary services	300
Fees, fines, legal services	137

Maurice Leven, *The Incomes of Physicians* (U. of Chicago Press, 1932), p. 108.
Maurice Leven, *The Practice of Dentistry and the Incomes of Dentists in Twenty States* (U of Chicago Press, 1932), p. 201.

Committee on the Cost of Medical Care, *Medical Care for the American People* (U of Chicago Press, 1932), p. 14.

Manufacturers' value, adj. for sales to industrial consumers and trade margin (wholesale one-third, retail 43%). Items incl.: optical goods, surgical appliances (artificial limbs, etc.), heating pads, vibrators, household health lamps, rubber goods (druggists and medical sundries)

Committee on the Cost of Medical Care, *The Costs of Medicines* (U of Chicago Press, 1932) p. 18, excl medicines distributed by physicians, hospitals, and dispensaries.

Half of total cost, W. F Willoughby, *Financial Condition and Operations of the National Government, 1921-1930* (Brookings Institution, 1931), *Financial Statistics of States; Financial Statistics of Cities*, and an estimate for places under 30,000 population based on reports of 8 states

One-fourth of total cost same sources as for administration of government

Three-fourths of total cost. same sources as for administration of government, and Committee on the Cost of Medical Care, *Medical Care for the American People*, p. 14.

Based on the no of deaths and cost of funerals among various classes of the population, J C Gebhart, *Funeral Cost* (Putnam, 1928), adj for expenses, such as flowers, included elsewhere.

Incl marriage licenses and fees to ministers, costs of divorce; consular and passport fees, judicial, patent and copyright fees (10%), court and customs fines (20%), legal services (estimated as services of 10% of the legal profession at an average income of \$5,000)

TABLE 11—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
EDUCATION AND READING, TOTAL	3,626	
Elementary and high schools	2,131	Office of Education, Department of the Interior, <i>Biennial Survey of Education, 1928-30</i> , Bulletin 20, II, 11
Universities and professional schools	441	
Other schools	118	
Libraries and extension work	268	Estimated from government expenditures (same sources as for administration of government)
Purchase of books	191	Three-fourths of total sales, estimated from manufacturers' value and trade margin (wholesale 43%, retail 54%)
Newspapers and periodicals	477	
SOCIAL ORGANIZATIONS, TOTAL	1,458	
Religious bodies	750	Estimated from contributions in 1926, <i>Census of Religious Bodies</i> , and increase from 1926 to 1929 in the contributions of 34 Protestant denominations, <i>Recent Social Trends</i> (New York, 1933), II, 1030, adj for cost of religious buildings erected.
Labor and professional organizations	200	Crude estimate based on fragmentary data regarding membership and dues of trade unions and professional societies.
Fraternal orders	175	J. F. Steiner, <i>Americans at Play</i> (McGraw-Hill, 1933), p. 183
Social, athletic, luncheon clubs	133	
Settlement houses, community activities, youth service	100	
Propagandist and misc social organizations	100	Crude estimate, see Steiner, <i>Americans at Play</i> , for expenditures of leading youth service organizations
RECREATION AND ART GOODS, TOTAL	3,658	
Moving pictures	1,250	Department of Commerce, <i>National Income, 1929-32</i> , p. 144.
Legitimate theatres	250	

Other commercial amusements	450	Estimated from ratio of receipts of corporations engaged in 'other amusements' to receipts of incorporated theatres, <i>National Income</i> , 1929-32, p. 230.	THREE ESTIMATES OF OUTPUT
Sporting goods, games, and toys	444	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale one-third, retail two-thirds). Items incl.: sporting and athletic goods, fireworks, firearms, ammunition, fish lines, telescopes, field and opera glasses, children's carriages and sleds, games, toys, and novelties.	
Music and art goods	126	Manufacturers' value, adj. for sales to industrial consumers, exports, imports, and trade margin (wholesale 41%, retail 43%).	
Cut flowers and plants	200	Sales of florists, Census of Retail Distribution, with slight adjustment for sales of street vendors, etc., omitted from Retail Census.	
Camps, hunting and fishing licenses, admission to parks, tourist lodgings (excl. hotels)	100	Expenditures for camps and hunting and fishing licenses from Steiner, <i>Americans at Play</i> , p. 183. Remainder a crude allowance for tourist lodging and recreation expenditures not incl. elsewhere.	
Tourist travel abroad (net)	638	Excess of American tourist expenditures abroad over foreign tourist expenditures in the U. S. (the latter being presumably incl. in various items), A. E. Taylor, <i>The Balance of International Payments of the United States in 1932</i> (U. S. Department of Commerce).	
Monuments (incl. tombstones)	72	Manufacturers' value, adj. for trade margin	355
Government expenditures for recreation	128	Same as for administration of government, above	
STIMULANTS, TOTAL	6,230		
Alcoholic beverages	3,750	Modification of estimate in Warburton, <i>The Economic Results of Prohibition</i> (Columbia U. Press, 1932)	
Tobacco	2,329	Sales by wholesalers and manufacturers' sales to retailers, adj. for trade margin (25%)	

TABLE 11—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE
Narcotics (non-medicinal)	25	Based on an estimate that there are more than 100,000 non-medicinal addicts (conversations with officials of the Bureau of Narcotics) who spend an average of \$250 a year.
Chewing gum	126	Sales of wholesalers, Census of Distribution, adj. for retail trade margin (25%).

¹ Trade margins are expressed as percentages of manufacturers' value, or of cost to wholesalers and retailers, respectively, and are derived chiefly from ratios of total expenses to net sales, adjusted for estimated profit margins, reported by the Census of Distribution. Adjustments have also been made for the percentage of each group of products sold by manufacturers to consumers, to retailers, and through wholesale organizations as given in the report by the Bureau of the Census, *Distribution of Sales of Manufacturing Plants*.

For some items, unpublished material made available through the courtesy of government and trade association officials has been used. Many of the prices used in the food estimates are weighted averages computed by the author from data obtained from various sources. Some of the figures, including the proportions of transportation outlays assigned to consumers and to business concerns, represent the judgment of the author after consideration of fragmentary data from various sources and consultation with informed persons in government departments or business concerns.

B A E.: Bureau of Agricultural Economics.

B A I.: Bureau of Animal Industry.

B H E.: Bureau of Home Economics.

B L S.: Bureau of Labor Statistics.

TABLE 12
COMMODITY-SERVICE CLASSIFICATION OF WARBURTON'S ESTIMATES OF THE VALUE OF CONSUMERS' GOODS, 1929
(millions of dollars)

		TOTAL COMMODITIES	PERISHABLE COMMODITIES	SEMI-DURABLE AND DURABLE COMMODITIES	TOTAL SERVICES	GOVERNMENT SERVICES ¹	OTHER SERVICES
<i>All Consumers' Goods and Services</i>	<i>85,317</i>	<i>52,301</i>	<i>32,290</i>	<i>20,011</i>	<i>33,016</i>	<i>4,868</i>	<i>28,148</i>
<i>Food and non-alcoholic beverages, total</i>	<i>20,055</i>	<i>19,894</i>	<i>19,894</i>		<i>161</i>		<i>161</i>
Total, excl home preparation	19,894	19,894	19,894				
Home preparation (professional cooks)	161				161		161
<i>Home maintenance, total</i>	<i>22,356</i>	<i>6,897</i>	<i>2,195</i>	<i>4,702</i>	<i>15,459</i>	<i>152</i>	<i>15,307</i>
Dwelling rentals (incl imputed value)	11,875				11,875		11,875
¹ Room rentals and institutional living quarters	1,206				1,206	152	1,054
Home equipment and decoration	4,702	4,702		4,702			
Household supplies and operation							
Supplies	665	665	665				
Fuel and light, excl. gas and electricity	1,404	1,404	1,404				
Gas and electricity ²	1,165				1,165		1,165
Ice	126	126	126				
Water and garbage removal ²	350				350		350
Domestic service	863				863		863
<i>Attire, total</i>	<i>13,669</i>	<i>11,947</i>	<i>496</i>	<i>11,451</i>	<i>1,722</i>		<i>1,722</i>
Clothing and shoes, ready-to-wear	8,582	8,582		8,582			
Clothing materials and making Materials	2,007	2,007		2,007			

THREE ESTIMATES OF OUTPUT

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T A B L E 1 2—*Cont*

	TOTAL	TOTAL COMMODITIES	PERISHABLE COMMODITIES	SEMIDURABLE AND DURABLE COMMODITIES	TOTAL SERVICES	GOVERNMENT SERVICES 1	OTHER SERVICES	358
<i>Attire, Cont</i>								
Dressmakers, milliners, and tailors	265				265		265	
Jewelry and other articles of apparel	730	730		730				
Care of clothing and apparel								
Dry cleaning, laundry, and pressing	733				733		733	
Shoe, jewelry, and watch repairing	133				133		133	
Luggage	92	92		92				
Personal care								
Barbering and hairdressing	591				591		591	
Cosmetics, perfumes, and misc. toilet preparations	339	339	339					
Toilet soaps, combs, razors, blades, etc 3	197	197	157	40				
<i>Transportation, total</i>	8,122	4,499	1,693	2,806	3,623	456	3,167	
Vehicles purchased	2,203	2,203		2,203				
Maintenance of motor vehicles								
Gasoline, oils, and greases	1,693	1,693	1,693					
Tires, tubes, and accessories	603	603		603				
Repairs and storage, taxes and registration fees, insurance	980				980		980	
Common carrier transportation	1,987				1,987		1,987	
Maintenance of highways and streets	456				456	456		
Moving and expressage	200				200		200	

P A R T F I V E

<i>Communication, total</i>	935	290	290		645		645	THREE ESTIMATES OF OUTPUT
Correspondence supplies	290	290	290					
Postal, telephone, and telegraph service	645				645		645	
<i>Health and medical care, total</i>	3,556	817	665	152	2,739	410	2,329	
Physicians, surgeons, other curative professions, and nurses	1,930				1,930		1,930	
Hospital and laboratory service, public health and organized medical services	809				809	410	399	
Health goods and appliances	152	152		152				
Drugs and medicines	665	665	665					
<i>Protective and civil services, total</i>	1,652	150	150		1,502	1,215	287	
Government, administration, protection, and sanitation	1,215				1,215	1,215		
Mortuary services ⁴	300	150	150		150		150	359
Fees, fines, and legal services	137				137		137	
<i>Education and reading matter, total</i>	3,626	735	477	258	2,891	2,507	384	
Schools and universities	2,690				2,690	2,507	384	
Libraries and extension work ⁵	268	67		67	201			
Purchase of books	191	191		191				
Newspapers and periodicals	477	477	477					
<i>Social organizations</i>	1,458				1,458		1,458	
<i>Recreation and art goods, total</i>	3,658	842	200	642	2,816	128	2,688	
Moving pictures, theatres, and other commercial amusements	1,950				1,950		1,950	
Sporting goods, games, and toys	444	444		444				

TABLE 12—Cont

	TOTAL	TOTAL COMMODITIES	PERISHABLE COMMODITIES	SEMI-DURABLE AND DURABLE COMMODITIES	TOTAL SERVICES	GOVERNMENT SERVICES ¹	OTHER SERVICES	360
<i>Recreation and art goods, Cont</i>								
Music and art goods	126	126		126				
Cut flowers and plants	200	200	200					
Camps, licenses, parks, etc	100				100		100	
Tourist travel abroad (net) ^a	638				638		638	
Monuments (incl. tombstones)	72	72		72				
Government expenditures for recreation	128				128	128		
<i>Stimulants</i>	6,230	6,230	6,230					

¹ Taxes collected from individuals are estimated at \$1,812 million, the estimated value of government services to individuals exceeds the taxes collected from them by \$3,056 million.

² Gas, electricity, and water should perhaps be classified as commodities. They are included with services to conform with Kuznets' classification.

³ Allocated 4/5 to perishable, 1/5 to semidurable and durable commodities.

⁴ Allocated 1/2 to perishable commodities, 1/2 to services.

⁵ Allocated 1/4 to semidurable and durable commodities, 3/4 to services.

⁶ Should perhaps be partly classified as commodities.

TABLE 13
 ALLOCATION OF LOUGH'S ESTIMATES OF CONSUMERS' SPENDING TO WarBURTON'S MAJOR
 CONSUMPTION CATEGORIES, 1929
 (millions of dollars)

LOUGH'S CATEGORIES	WarBURTON'S MAJOR CONSUMPTION CATEGORIES										
	TOTAL (LOUGH) ¹	Food and Non-Al- coholic Bever- ages	Home Mainte- nance	Attire	Trans- por- tation	Com- muni- cation	Health and Medi- cal Care	Protec- tive and Civil Serv- ices	Edu- cation and Read- ing	Recrea- tion Social and Organi- zations	Stim- ulants
<i>Total Consumers' Spendings</i>	80,070	19,513	22,218	12,247	9,209	1,391	2,904	3,120 *	2,182	3,497	3,789
<i>Food and soft drinks</i>	19,614										
<i>Total, excl. chewing gum</i>	19,513	19,513									
<i>Chewing gum</i>	101										101
<i>Alcoholic beverages and other illegal commodities</i>	2,000										2,000
<i>Tobacco</i>	1,688										1,688
<i>Clothing</i>	9,927			9,927							
<i>Transportation</i>	8,470				8,470						
<i>Home maintenance</i>	22,865										
<i>Total, excl. following 5 items</i>	21,313		21,313								

TABLE 13—Cont

WARBURTON'S MAJOR CONSUMPTION CATEGORIES

LOUGH'S CATEGORIES	TOTAL (LOUGH) ¹	Food and Non-Al- coholic Bever- ages		Home Main- tenance Attire	Trans- por- tation	Com- muni- cation	Protec- tive Health and Medi- cal Care		Civil Serv- ices	Edu- cation and Social Read- Organi- ing zations		Recrea- tion and Art Goods	Stim- ulants
<i>Home maintenance, Cont.</i>													
Musical instruments other than pianos, phonographs, and radios	27											27	
Flowers, plants, and seeds	275											275	
Laundry and dry cleaning	600			600									
Moving expenses	100				100								
Telephone	550					550							
<i>Sickness and death</i>	3,153												
Total, excl. following 2 items	2,904						2,904						
Caskets and funeral supplies	172									172			
Undertakers	77									77			
<i>Personal appearance</i>	1,680												
Total, excl. photographers	1,629			1,629									
Photographers	51											51	
<i>Recreation</i>	4,663												
Total, excl. following 3 items	3,133											3,133	
Trunks and leather goods	91			91									
Hotels, etc.	800		800										
Railroad and Pullman fares	639				639								

<i>Social-cultural activities</i>	4,764				
Artists' materials	11				11
Books, newspapers and periodicals	804			804	
Envelopes, glue, ink, mucilage, paper	352		352		
Paper goods	105	105			
Pencils, pens, stationery, typewriters	139		139		
Tuition privately paid	550			550	
Postage	350		350		
Fraternal, civic, union, and grange dues	470				470
Artists, sculptors, teachers of art	57			57	
Musicians and music teachers	73			73	
Lawyers	141		141		
Church and charity	1,500				1,500
Immigrant remittances	212				212
<i>Direct taxes</i>	1,246			1,246 *	

¹ *High-Level Consumption*, pp 236-46 Grand total excludes savings.

* Allocated to 'protective and civil services' and 'education and reading' jointly.

TABLE 14

COMMODITY-SERVICE CLASSIFICATION OF LOUGH'S ESTIMATES OF CONSUMERS' SPENDINGS, 1929
(millions of dollars)

	COMMODITIES AND SERVICES CLASSIFIED BY WARBURTON'S MAJOR CATEGORIES												
	TOTAL COMMODI- TIES OR SERV- ICES ¹	PERISH- ABLE COM- MOD- ITIES	SEMI- DURABLE AND DU- RABLE COM- MOD- ITIES	Food and Non- Alco- holic Bev- erages	Home Mainte- nance	Attire	Trans- porta- tion	Comm- unica- tion	Health and Medical Care	Protective and Civil Services, Edu- cation and Reading	Social Organi- zations	Recrea- tion and Art Goods	Stimu- lants
Total Consumers' Spendings	80,070			19,513	22,218	12,247	9,209	1,391	2,904	3,120	2,182	3,497	3,789
Commodities, total	49,243	29,259	19,984	19,513	7,012	10,523	5,530	491	731	976		678	3,789
Food and soft drinks	19,614	19,614											101
Alcoholic beverages and to- bacco													3,688
Clothing	3,688	3,688											
Transportation ²	9,518		9,518			9,518							
Home maintenance ³	5,530	1,501	4,029				5,530						
Sickness and death ⁴	7,209	2,136	5,073		6,907							302	
Personal appearance ⁵	903	765	138						731	172			
Recreation	914	554	360			914							
Social-cultural activities ⁶	456		456			91							365
Service (intangible), total	1,411	1,001	410		105			491		804		11	
Clothing	30,827				15,206	1,724	3,679	900	2,173	2,144	2,182	2,819	
Transportation	409					409							
Home maintenance	2,940						2,940						
Sickness and death	15,056				14,406	600	100	550					
Personal appearance	2,250								2,173	77			
Recreation	766					715						51	
Social-cultural activities	4,207				800		639					2,768	
Direct taxes	3,353							350		821	2,182		
	1,246									1,246			

¹ High-Level Consumption, pp. 236-46² Gasoline and oil classified as perishable, other items as semidurable and durable³ Part of household supplies (soap, matches, etc.), coal, wood, and ice, flowers, plants, and seeds, and extra-commercial consumption classified as perishable, other items as semidurable and durable⁴ Caskets and funeral supplies, druggists' preparations and patent medicines classified as perishable, optical goods, rubber goods, and surgical appliances and supplies as semidurable and durable⁵ Perfumes and cosmetics, razors and blades, and soap classified as perishable, brushes, jewelry, and watches as semidurable and durable⁶ Typewriters and half of books, newspapers, and periodicals classified as semidurable and durable, other items as perishable

TABLE 15
ALLOCATION OF KUZNETS' MINOR COMMODITY GROUPS INCLUDED IN CONSUMERS' OUTLAY TO WarBURTON'S
MAJOR CONSUMPTION CATEGORIES, 1929
(millions of dollars)

For method of allocation of minor commodity groups starred (*) see Table 16

KUZNETS' CATEGORIES		WARBURTON'S MAJOR CONSUMPTION CATEGORIES											
		TOTAL (KUZ- NETS) ¹	Food and Non-Alco- holic Bever- ages	Home Mainte- nance	Attire	Trans- por- tation	Com- muni- cation	Health and Medi- cal Care	Pro- tec- tive and Civil Services	Edu- cation and Read- ing	Social Organi- zations	Recre- ation and Art Goods	Stimu- lants
Total Consumers' Outlay on Commodities		50,845	19,421	7,561	11,851	6,637	430	896	228	1,023		711	2,086
Perishable commodities, total		28,550	19,421	2,263	831	1,729	430	768	228	739		52	2,086
1*	Food and kindred products	18,233	17,977	170									86
2	Cigars, cigarettes, and tobacco	2,000											2,000
3*	Drug, toilet, and household preparations	1,791		211	812			768					
4*	Magazines, newspapers, stationery and supplies, and misc paper products	1 456		215	19		430			739		52	
5a*	Fuel and lighting products, mfd. petroleum products	2,192		461		1,729							
5b	Coal	1,206		1,206									
6a	Caskets and coffins	228							228				
	Commodities consumed on farms ²	1,524	1,524										

THREE ESTIMATES OF OUTPUT

TABLE 15—Cont

WARBURTON'S MAJOR CONSUMPTION CATEGORIES

KUZNETS' CATEGORIES		Food and Non-Alco- holic Bever- ages	Home Mainte- nance	Attire	Trans- por- tation	Com- muni- cation	Health and Medi- cal Care	Pro- tec- tive and Civil Services	Edu- cation and Read- ing	Social and Organi- zations	Recre- ation and Art Goods	Stimu- lants
TOTAL (KUZ- NETS) ¹												
<i>Perishable commodities—Cont.</i>												
292, 295	Adjustment for change in inventories of wholesalers and retailers	—80	—80									
<i>Semidurable commodities, total</i>		12,382	879	10,307	725						472	
7*	Dry goods and notions	1,577	132	1,445								
9	Clothing and furnishings, men's and boys'	2,836		2,836								
10a	Clothing, women's, misses', and children's	3,895		3,895								
10b	Furs and fur goods	252		252								
11	Shoes and other footwear	1,745		1,745								
12	Misc house furnishings	747	747									
13	Toys, games, and sporting goods	472									472	
14	Tires and tubes	725			725							
293, 295	Adjustment for change in inventories of wholesalers and retailers	+134		+134								
<i>Consumers' durable commodities, total</i>		9,913	1,419	713	4,181		128		244		187	
15	Household furniture	1,127	1,127									
16	Stoves, ranges, and water heaters	365	365									

17a	Washing machines, sewing machines, etc.	234	234					
17b	Domestic refrigerators, mechanical	214	214					
18	House furnishings (durable)	939	939					
19	China and household utensils	542	542					
20	Portable household electrical appliances, etc.	180	180					
21	Radio apparatus and equipment	674	674					
22*	Musical instruments	205	121				84	
23*	Jewelry, silverware, clocks, and watches	737	144	593				
24	Printing and publishing books	284				284		
25	Luggage	120		120				
26	Passenger cars	3,391		3,391				
27	Auto parts and accessories	737		737				
28	Motorcycles, bicycles, and accessories	25		25				
29	Pleasure-craft	30		30				
30	Ophthalmic products and surgical and orthopedic appliances	128				128		
31	Monuments and tombstones	103					103	
293, 296	Adjustment for change in inventories of wholesalers and retailers	—121	—121					

¹ *Commodity Flow and Capital Formation, Volume One*, p. 212 (minor commodity groups) and p. 478 (group totals). Servicing of consumers' durable goods excluded.

² Primarily food, though a small part is the value of fuel and should be allocated to home maintenance.

TABLE 16

METHOD OF ALLOCATION OF KUZNETS' MINOR COMMODITY GROUPS TO Warburton's MAJOR CONSUMPTION CATEGORIES, 1929

MINOR COM- MODITY GROUP	PAGE REFER- ENCE ¹	INDUSTRY NUMBERS	ITEM	PER- CENTAGE	ALLOCATION OF MANUFACTURER'S VALUES (NOT ITALICIZED), COST TO CONSUMER (ITALICIZED)											
				RATIO	Food and									Health	Edu-	Recrea-
				PRO- DUCER'S TOTAL	Non-									and	cation	tion
				VALUE TO COST	Alco-	Home	Trans-	Com-	Med-	Edu-	Recrea-	tion	tion			
				TO CON- SUMER	CON- SUMER	Bever-	Mainte-	Attire	porta-	muni-	ical	Read-	Art	Stimu-		
						ages	nance		tion	cation	Care	ing	Goods	lants		
								(millions of dollars)								
1	80	108	Chewing gum												58 6	
	80	119	Mfd. ice				115 8									
	212	Cost to consumer		68 0	182 3	2 7	179 7	6 2	170.3						86 2	
3	81	601	Alcohol ethyl and dis- tilled liquors									21.4				
	81	604-09	Cleaning and polishing preparations, etc.				126 5									
	81	611,627	Medicinal preparations									413 6				
	81	628,631, 1103	Soap, cosmetics, etc					490 6								
	81	1645	Bandages, etc.									44 5				
	134		Rubber sundries					15 7								
	142		Net foreign trade ²					—18 2				—18 2				
		Total manufacturers' values					126 5	488 1				461 3				
	212	Cost to consumer		60 1	1791.4		210 5	812 1				767 5				

4	81	401-06, 408	Converted paper products			111 4		70 7		
	81	407, 504-06	Writing paper, greeting cards					84 1		
	81	501	Bookbinding, etc.						38 9	
	81	508-10	Newspapers and periodicals						460 3	
		"	Music							16 5
		"	Paper patterns			13 0				
		"	Commercial printing					19 9		
	81	619, 621, 802	Ink, paste, erasers, etc.					13 4		
	81	1603, 1612	Artists' materials, etc.						17 7	
	81	1633, 1634, 1643	Pencils, pens, stationery goods					103 8		
	142		Net foreign trade 2					-9 4	-14 0	
			Total manufacturers' values			141 4	13 0	282 6	485 2	34 2
	212		Cost to consumer	65 7	1456 4	215 2	19 8	430 1	738 5	52 2
5a	82	704-05	Lubricating oils and greases					107 6		
	82		Gasoline					949 4		
	82		Remainder of Group 5a			261 6				
	142		Net foreign trade 2					-76 8		
			Total manufacturers' values			261 6		980 2		
	212		Cost to consumer	56 7	2191 8	461 4		1728 7		
7	82	216	Osnaburgs, sheetings			79 1				
			Cost to consumer	59 9	1577 2	132 1	1445 1			

TABLE 16—Cont

			PER- CENTAGE RATIO PRO- DUCER'S TOTAL VALUE TO COST TO CON- SUMER	ALLOCATION OF MANUFACTURER'S VALUES (NOT ITALICIZED), COST TO CONSUMER (ITALICIZED)									
MINOR COM- MODITY GROUP	PAGE REFER- ENCE ¹	INDUSTRY NUMBERS	ITEM	CON- SUMER	Non- Alco- holic Bever- ages	Food and Home Mainte- nance	Trans- porta- tion	Com- muni- cation	Health and Med- ical Care	Edu- cation Read- ing	Recrea- tion and Art Goods	Stimu- lants	
<i>(millions of dollars)</i>													
22	87	1627-30	Pianos, organs			49 5							
	87	"	Wind, stringed and per- cussion instruments, music rolls, etc.								14 1		
	87	1635	Phonographs			20 8							
	88	"	Phonograph records and parts								34 1		
	134		Phonograph needles								2 0		
	142		Net foreign trade			—3 4					—3 4		
			Total manufacturers' values			66 9					46 8		
	212		Cost to consumer	55 5	205 0	120 5					84 3		
23	88	1213-14	Plated wear, silversmith- ing, and silverware			78 7							
	212		Cost to consumer	54 6	736 9	144 1	592 8						

¹ Kuznets, *Commodity Flow and Capital Formation, Volume One*² Net foreign trade allocated arbitrarily after inspection of figures reported in *Statistical Abstract of the United States*

TABLE 17
WARBURTON'S ESTIMATES OF THE VALUE OF OUTPUT OF CAPITAL GOODS, 1929
(from unpublished manuscript)

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE ¹
<i>Gross, before Allowance for Depreciation</i>	17,808	
<i>Net, after Allowance for Depreciation</i>	9,733	
RESIDENTIAL BUILDINGS, TOTAL	3,508	
Apartments and hotels	933	F. W. Dodge Corporation Half of total, Dodge B A E.
1- and 2-family houses	1,206	
Small projects	1,184	
Farm dwellings	185	
PUBLIC AND SEMI-PUBLIC STRUCTURES, TOTAL	2,714	
<i>Buildings, total</i>	960	
Educational	413	Construction in 37 states, Dodge, increased 17 2% on basis of estimate for all nonresidential construction in 37 states and in the nation.
Hospital and institutional	167	
Public: courts, jails, offices, etc.	130	
Religious and memorial	115	
Social, recreational, misc. small contracts	135	Excess of Dodge estimate over Census of Construction estimate of social and recreational buildings, plus 5% of small contracts, Dodge.
<i>Highways and streets, total</i>	1,333	
States	533	<i>Financial Statistics of States, 1929.</i> Federal aid incl. <i>Financial Statistics of Cities, 1929.</i> Estimated on basis of total expenditures on streets and roads by local governments (except cities over 30,000 population) in 8 states and ratio of outlays to maintenance in 2 states and in cities over 30,000 population.
Cities over 30,000 population	380	
Other local governments	420	

TABLE 17—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE ¹
<i>Other public works, total</i>	421	
Federal expenditures—rivers, dams, harbors	91	Willoughby, <i>Financial Condition and Operations of the National Government, 1921-1930</i> , p. 158. Items incl. rivers and harbors, Mississippi flood control, Muscle Shoals Dam. Figure is half of total for 1928-29 and 1929-30.
Sewage and refuse disposal and drainage	100	Census of Construction
Water supply	72	Census of Construction (half of total)
Docks, piers, and retaining walls	20	Census of Construction
Parks, grounds, etc.	4	<i>Annual Report, Comptroller, City of New York, 1932</i>
Rapid transit lines, New York City	81	Arbitrary allowance for misc. public works not done by contract, and not incl. elsewhere. Total is probably larger than this allowance.
Allowance for omissions	50	
BUSINESS STRUCTURES, TOTAL	5,472	
<i>Commercial and industrial buildings</i>	2,104	Dodge, <i>The Prospects for Building in 1931</i> , 15% of small projects incl.
<i>Transportation structures, total</i>	1,106	
Class I railroads	532	Bureau of Railway Economics, Special Series No. 53, <i>Railway Supplies and Capital Expenditures</i> , roadway and structures incl.
Electric railways	5	Federal Employment Stabilization Board, excl. New York City subways.
Subway work	72	Census of Construction
Pipe lines	475	Assumed to be same as in 1930, Federal Employment Stabilization Board.
Air transport	22	Census of Construction
<i>Public utility structures, total</i>	1,649	
Electric power companies	795	Federal Employment Stabilization Board
Gas companies	197	Assumed to be same as 1930, Federal Employment Stabilization Board.
Telephone companies	600	
Telegraph companies	57	

<i>Agricultural improvements</i>	278
<i>Misc. building and engineering construction</i>	335
MACHINERY AND EQUIPMENT, TOTAL	5,748
<i>Transportation machinery and equipment, total</i>	<i>2,296</i>
Passenger automobiles for business use	1,079
Trucks, busses, chassis, trailers	570
Steam railroad equipment	321
Electric railway equipment	29
Ship and boat building	92
Other transportation equipment, outdoor	68
Other transportation equipment, indoor	137
<i>Electric and power equipment, total</i>	<i>1,132</i>
Electric machinery, transmission devices and apparatus	435
Telephone and telegraph apparatus	188
Power generating apparatus, except electric, automotive, and locomotive	509

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Census of Construction items incl social and recreational buildings, rail and water transportation buildings (half), misc. buildings, dock, pier, and retaining wall (half), flood control and irrigation (half), radio tower, misc public works and utilities, misc construction.

One-third of new passenger car sales, estimated from sales of automobile salesrooms, Census of Retail Distribution, state reports, and sales of wholesale trade at retail, Census of Wholesale Distribution, U. S. summary.

Census of Manufactures, adj. for exports and trade margin (20%). *Railway Supplies and Capital Expenditures*, Bureau of Railway Economics, Special Series No. 53

Electric Railway Journal, January 1930, incl cars and trolley line materials

Manufacturers' value, excl motorboats under 5 tons, sailboats, rowboats, canoes.

Manufacturers' value, adj for sales to consumers, exports, and trade margin (20%) Items incl . aircraft, farm wagons, trucks and business wagons, wheelbarrows, hand and push carts, motorcycles and bicycles

Manufacturers' value, adj for exports and trade margin (20%) Items incl.. cranes, conveying and elevating machinery, industrial cars and trucks

Manufacturers' value, adj for exports and trade margin (20%) Items incl control apparatus, generators, transformers, measuring instruments, searchlights and floodlights, rectifying apparatus, stationary motors.

Manufacturers' value, adj for exports and trade margin (20%)

Manufacturers' value, adj. for exports and trade margin (20%) Items incl engines, tractors and waterwheels, windmills and windmill towers, mechanical stokers, transmission machinery

TABLE 17—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE ¹
<i>Industrial machinery and equipment, total</i>	<i>1,297</i>	
Food, beverage, refrigerating	119	Manufacturers' value, adj. for exports, imports, and trade margin (20%), and dairy, cheese, and butter machinery incl in farm machinery. Items incl: bakers, bottling, canning, coffee roasting, confectionery and ice cream, flour mill, oil mill, packing house, refrigerating (except domestic), sugar mill machinery.
Textile, clothing, laundry	180	Manufacturers' value, adj. for exports, imports, and trade margin (5%). Items incl: cotton gins, clothing, pressing, and hatmaking machinery, laundry, shoe, and textile machinery, industrial sewing machines.
Construction and excavating machinery	71	Manufacturers' value, adj. for exports, imports, and trade margin (10%). Items incl: cement and concrete machinery, excavating machinery.
Mining, oil, and refining machinery	132	Manufacturers' value, adj. for exports and trade margin (5%). Items incl: mining, oilwell and oil refinery machinery, mining cars and trucks.
Well drilling and pumping machinery	162	Manufacturers' value, adj. for exports and trade margin (20%). Items incl: well drilling machinery, pumps and pumping machinery.
Paper and publishing machinery	87	Manufacturers' value, adj. for exports and trade margin (5%). Items incl: bookbinding, paper mill and pulp mill, photo-engraving, printing and paper box machinery.
Machinery for working clay, glass, stone, wood, rubber, leather	-	
	68	Manufacturers' value, adj. for exports and trade margin (20%).
Machine tools, attachments, foundry and welding machinery	376	Manufacturers' value, adj. for exports and trade margin (20%). Items incl: machine tools, machine tool accessories and small metal working tools, and welding machinery.

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Misc. industrial machinery	102	Manufacturers' value, adj. for exports and trade margin (20%). Items incl: blowers and exhaust fans, gas machines, gas regulators and governors, hydraulic machinery, incandescent lamp machinery, pneumatic machinery, tobacco machinery, pharmaceutical machinery, foundry machinery, electric furnaces and ovens, electric welding apparatus, point making machinery.	THREE ESTIMATES OF OUTPUT
Farm machinery and equipment	320	Manufacturers' value for domestic use, adj. for items incl elsewhere (horse-drawn vehicles, tractors, engines, pumps, water systems, and other small items) and trade margin (20%).	
Trade, service, professional equipment, total	600	Manufacturers' value, adj. for exports, sales to consumers (typewriters), and trade margin (35%). Items incl: adding, calculating, addressing, check-writing, and manifolding machines, cash registers, and typewriters.	
Office machinery	155		
Office furniture	98	Manufacturers' value, adj. for exports and trade margin (35%).	
Store and lunchroom furniture and fixtures	147	Manufacturers' value, adj. for exports and trade margin (25%).	
Professional, laboratory, and other furniture	29	Manufacturers' value, adj. for exports and trade margin (25%). Items incl.. professional and laboratory furniture, billiard and pool room furniture.	
Misc. trade and service equipment	171	Manufacturers' value, adj. for exports and trade margin (25%). Items incl. electric heating, cooking, beauty shop and barber shop apparatus, packing machines, scales and balances, baling presses, meters, vending machines, motion-picture cameras, lockers, ladders and parts, scaffolding equipment, safes and vaults, electric-therapeutic and medical apparatus	
Machinery and equipment for government use, total	103	Manufacturers' value, adj. for trade margin (10%).	
Furniture and fixtures for public buildings	45		
Roadbuilding and dredging machinery	32	Manufacturers' value, adj. for exports and trade margin (5%).	375
Highway fixtures, traffic signals, fire alarm apparatus	11	Manufacturers' value, adj. for trade margin (20%) Items incl. street traffic signals and accessories, fire alarm apparatus, street and highway fixtures	
Motor vehicles	15	Manufacturers' value, adj. for trade margin (20%) Items incl government motor vehicles and motorcycles	

TABLE 17—Cont

	AGGREGATE VALUE (millions of dollars)	METHOD OF ESTIMATE ¹
CHANGES IN INVENTORIES, NET TOTAL	145	
<i>Finished goods, total</i>	—354	Value of corporate inventories, excl. financial corporations, December 31, 1928 and 1929, U. S. Bureau of Internal Revenue, <i>Statistics of Income</i> , adj. for estimated percentages of business done by non-corporate enterprises in the major industrial groups, 1928 and 1929. Inventories of enterprises engaged in trade and half of inventories of food manufacturers classified as finished goods; other inventories classified as materials and semi-finished goods
Trade	—385	
Other	31	
<i>Materials and semi-finished goods, total</i>	946	
Manufacturing	567	
Mining	191	
Construction	48	
Transportation and public utilities	119	
Service and misc	21	
<i>Farm stocks, total</i>	—447	Estimated from change in stocks and farm prices, B. A. E.
Wheat, corn, oats, barley	—109	
Other crops	—218	
Animals	—120	B. A. E.
CHANGE IN INVESTMENT ABROAD	221	A. E. Taylor, <i>The Balance of International Payments of the United States in 1932</i>
DEPRECIATION OF STRUCTURES AND EQUIPMENT, TOTAL	8,075	
Residences	1,781	Estimated at 15% of residential rental values Estimated at 5% of value of publicly owned property. Value of property owned by states and by cities over 30,000 population from <i>Financial Statistics of States</i> and <i>Financial Statistics of Cities</i> . Value of property owned by other government bodies assumed to be roughly proportional to 'outlays' as compared with 'outlays' of states and of cities over 30,000 population. Additional small allowance made for semi-public properties
Public and semi-public properties	930	

Corporate property	3,871	<i>Statistics of Income, 1929</i>
Farms	912	<i>Income from Farm Production in the United States, B A E., re-</i> <i>printed from Crops and Markets, April 1933.</i>
Other non-corporate business enterprises	581	Estimated at 15% of amount allowed by corporations, on basis of relative corporate and non-corporate business.

¹ Trade margins are expressed as percentages of manufacturers' value, or of cost to wholesalers and retailers, respectively, and are derived chiefly from ratios of total expenses to net sales, adjusted for estimated profit margins, reported by the Census of Distribution. Adjustments have also been made for the percentage of each group of products sold by manufacturers to consumers, to retailers, and through wholesale organizations as given in the report by the Bureau of the Census, *Distribution of Sales of Manufacturing Plants*.

For some items, unpublished material made available through the courtesy of government and trade association officials has been used. Some of the figures, including the proportions of transportation outlays assigned to consumers and to business concerns, represent the judgment of the author after consideration of fragmentary data from various sources and consultation with informed persons in government departments or business concerns.

B.A.E.: Bureau of Agricultural Economics

TABLE 18

RECLASSIFICATION OF WARBURTON'S AND KUZNETS' ESTIMATES
OF CAPITAL FORMATION, 1929

(millions of dollars)

	WARBURTON ¹	KUZNETS	PAGE REFERENCE ²
<i>Gross Capital Formation</i>	17,808	20,298	
<i>Net Capital Formation</i>	9,733	10,082	
<i>Residential buildings</i>	3,508	3,010	384
<i>Public structures</i>	2,599	2,928	392
<i>Business structures (excl. transportation and public utility), total</i>	2,832	2,552	384
Commercial and industrial buildings	2,104	1,596	
Religious and memorial buildings	115	117	
Miscellaneous, incl social and recreational buildings	335	561	
Agricultural improvements	278	278	
<i>Transportation and public utility structures, total</i>	2,755	2,030	388
Steam railroads	532	509	
Electric railways	77	90	
Pipelines	475	108	
Air transport	22		
Electric light and power	795	755	
Gas, mfd and natural	197	232	
Telephone	600	600	
Telegraph	57	48	
Waterworks, private		12	
Adjustment for duplication		-324	
<i>Machinery and equipment, total</i>	5,748	6,487	392
Passenger automobiles for business use	1,079		
Other transportation equipment	1,217	1,087	213
Electric equipment (incl. telephone and telegraph)	623	1,000	"
Industrial machinery and equipment	1,806	2,251	"
Farm machinery and equipment (incl. tractors)	320	698	"
Trade, service, and professional equipment ³	600	1,182	"
Machinery and equipment for government use	103		
Durable containers and misc durable equipment		387	213

TABLE 18—Cont.

RECLASSIFICATION OF WARBURTON'S AND KUZNETS' ESTIMATES
OF CAPITAL FORMATION, 1929
(millions of dollars)

	WARBURTON ¹	KUZNETS	PAGE REFERENCE ²
Adjustment for change in inventories of wholesalers and retailers		—119	294, 296
<i>Farm livestock, gross increase</i>		442	324
<i>Change in business inventories, net total</i>	+145	+2,414	455
Finished commodities			
Trade	—385	+185	292-97
Other ⁴	+31		
Industrial materials and semi-finished commodities			
Manufacturing	+567	+558	441
Mining	+191	+187	"
Construction	+48	+270	"
Transportation and public utilities	+119	+121	"
Trade		+177	441, 292-97
Service and miscellaneous	+21	+6	441
Farm crops and animals			
Wheat, corn, oats, and barley	—109	—109	440
Other crops	—218		
Animals	—120	—73	440
Financial institutions			
Finance corporations		+268	441
Adjustment for price changes during the year ⁵		+824	408
<i>Change in stocks of silver and gold</i>		+145	458
<i>Net change in investment abroad</i>	+221	+312	478
<i>Capital Consumption</i>	8,075	10,216	494
<i>Residences, total</i>	1,781	2,480	494
Book values (accounting measures)	1,781	1,838	F-161
Adjustment for price changes		642	F-167, 161
<i>Public properties, total</i>	930	602	494
Book values (accounting measures)	930	524	F-161
Adjustment for price changes		78	F-167, 161
<i>Business properties, total</i>	5,364	7,134	494
Book values (accounting measures)			
Corporate property ⁶	3,871	4,430	F-263
Non-corporate, other than farm	581	715	F-263
Farm property, excl. animals	912	918	F-263

TABLE 18—Cont

RECLASSIFICATION OF WARBURTON'S AND KUZNETS' ESTIMATES
OF CAPITAL FORMATION, 1929
(millions of dollars)

	WARBURTON ¹	KUZNETS	PAGE REFERENCE ²
Farm animals		435	F-116
Adjustment for price changes		+666	F-167,161
Marine and fire losses		223	F-161
Adjustment for depreciation of passenger cars ⁷		-463	
Other adjustments ⁸		+140	

¹ From Table 17

² Kuznets, *Commodity Flow and Capital Formation, Volume One*, except items marked F, which refer to Solomon Fabricant, *Capital Consumption and Adjustment*.

³ Includes the following items in Kuznets' estimate. office and store equipment, vending machines, signs, soda-water apparatus, theatrical scenery, office and store furniture and fixtures, professional and scientific equipment, carpenters' and mechanics' tools.

⁴ Half of change in inventories of food manufacturers.

⁵ In Kuznets' estimate, difference between net change in current prices (p. 455) and net change in current valuation (p. 408)

⁶ Warburton's estimate includes depreciation, Kuznets' estimate includes depreciation and depletion

⁷ Fabricant's estimates include depreciation on passenger cars used by business enterprises. This depreciation was omitted from Kuznets' estimates because all passenger cars were classified as consumers' commodities.

⁸ Differences between Fabricant's revised estimates published in *Capital Consumption and Adjustment* and his earlier estimates available at the time of publication of *Commodity Flow and Capital Formation, Volume One*

Discussion

I A. G. HART

At several points, the discrepancies between the Warburton and Kuznets estimates of consumption seem to rest on the treatment of goods and services that have been charged to 'business expense' although they are typically bought for consumption. (An important case in point is the allowance for passenger automobiles.) In the debate over these discrepancies, we cannot safely assume that there is an ideal objective measure of consumption that we are trying to approximate. These expenditures constitute a genuine twilight zone between income and business expense. If business expense includes a visit to a night club for a salesman, we must reckon that he has received some income in kind.¹ Or if we rigorously exclude all such items from income, we are under obligation to sift out items paid out of wages and salaries that are really business expense.² For many purposes some such sifting might be useful, for instance, expense for heating, an incident of working in the North, might be deducted in comparing income distributions between North and South. But it is well to keep in mind that any line we may choose to draw is arbitrary; it must be justified in the light of the purpose the estimate is to serve.

II SIMON KUZNETS

Dr. Warburton has succeeded, at the expense of much of his time and probably patience, in rearranging the three estimates of consumers' outlay and national product so as to facilitate intelligent

¹ This assumes that the visit has a positive utility to the salesman, but it may be surmised that natural selection draws people into occupations who like rather than dislike the incidental amusements, travel, etc.

² Dr. Shoup gave an admirable list of puzzles along this line in his paper in *Volume One*, pp. 261-9; so I need not labor the point.

comparison. This is a distinct service. But, strangely enough, there appears to be little connection between the substance of his performance, as embodied in the tables, and the general observations he submits at the conclusion of the report. Indeed, a scrutiny of the tables leads one to agree with the fourth observation alone, namely, the desirability of and need for a comprehensive investigation of the value of the nation's output of commodities and services. The other three observations seem to be either contradicted or not supported by the tabular comparisons.

1 COMPARISON OF NATIONAL INCOME ESTIMATES

Dr. Warburton's estimates of national income were obtained by adding the direct estimates of the value of consumers' outlay and of net capital formation. Those presented by the National Bureau of Economic Research and the Department of Commerce are based on income payments and business savings originated in the various industrial branches. Since the latter two estimates were derived by similar methods, it will be sufficient to compare Dr. Warburton's total with the one with which I am most familiar, that of the National Bureau of Economic Research. Also, since 1929 is the basic year in all estimates compared, and since discrepancies in other years stem largely from the sources that account for the discrepancy in 1929, the analysis of the difference may be confined to that year.

For 1929, Dr. Warburton's estimate of national income is \$95,050 million, whereas the estimate of the National Bureau is \$83,424 million, a substantial difference of \$11.6 billion. But the various sources of this discrepancy are easily identified.

First, there are items included in Dr. Warburton's estimate and excluded from ours: imputed rental value on farm homes, income from rooms in private homes and lodging houses, and the value of alcoholic beverages and narcotics. The former two were excluded because we found it impossible to derive reliable annual estimates: in measuring national income as an annual index of net value product, one is forced to omit minor items for which no reliable continuous measures are feasible. Alcoholic beverages and narcotics were excluded on the general ground that income from illegal activities cannot be treated as productive and hence cannot be included in the national income total.

This point has been discussed elsewhere and need not be dwelt upon here, except to suggest that in order to maintain a consistent position, Dr. Warburton should have included consumers' outlay on the services of the prostitution, gambling, bribery, and similar industries.

The four items listed above are estimated by Dr. Warburton in Table 11 at \$708 million for imputed rent on farm homes, \$746 million for roomers and boarders, \$3,750 million for alcoholic beverages, and \$25 million for non-medicinal narcotics. But of this total of \$5.23 billion, a part represents the production of legitimate commodities and, hence, must have been included in our estimates of national income. This consideration applies to alcoholic beverages and narcotics only, since Dr. Warburton's estimates of the rental items are characterized by him as comprising services alone. It is difficult to estimate the value of the legitimate commodities consumed in 1929 in the production of alcoholic beverages and narcotics, but if we assume it to be 20 per cent of the total value of these items as estimated by Dr. Warburton, a pure guess, we find that under the present head the accountable excess of Dr. Warburton's estimate over ours is \$4.47 billion.

Second, there are three items included in both measures of national income, but for which our estimates are lower: rent paid on non-farm houses, imputed rental on owned non-farm homes, and government services. The difference in the estimates of government services arises from our use of the taxes-paid basis of valuation and Dr. Warburton's use of the cost basis. The discrepancy in the rent items seems to be largely attributable to the fact that while we used the additional evidence made available in the Financial Survey of Urban Housing, Dr. Warburton did not. These data allowed a more detailed approximation of the relation between the value of houses and imputed rent and of the average values in the class intervals of the rent distribution of the Census of Families for 1930.

Dr. Warburton's estimate of rent on non-farm homes is \$4,829 million; ours is \$4,413 million, or \$416 million less. The comparable figures for imputed rental on owned non-farm homes are \$6,338 and \$4,828 million, a difference of \$1,510 million.¹

¹ Our estimates have recently been revised to take advantage of D. L. Wickens'

These two differences, added to the discrepancy for government services of \$3,056 million (see Table 12, footnote 1) yield a total excess under this head in Dr. Warburton's estimate of \$4.98 billion.

Third, some items in Dr. Warburton's estimate of consumers' outlay on services seem decidedly too high, while at least one is palpably too low. To the former category belong services parts of whose cost is covered by business and other enterprises but which, probably for lack of basis of apportionment, Dr. Warburton includes entirely under outlay by ultimate consumers. Thus the total of health and medical services (\$3,556 million, Table 11) must include a considerable amount paid by business and public agencies, even though the estimate does exclude salary receipts of physicians and dentists. Similarly, the service part of recreation and amusements (\$1,950 million, Table 12) should be partly charged to business and other agencies, rather than fully to ultimate consumers. The same applies to such items as contributions to religious bodies (\$750 million, Table 11), propaganda organizations, and settlement houses (\$200 million, Table 11). The total under this category is about \$6.5 billion. What percentage of this total is paid for directly by agencies other than ultimate consumers is hard to say. But it may be guessed to be not much less than 20 per cent, i.e., \$1.3 billion.²

On the other hand, Dr. Warburton's estimate of the outlay for domestic service is palpably too low. His estimate of \$1,024 million (\$161 million for home preparation and \$863 million for domestic service, Table 11) is based upon a consideration of four occupations only and makes no provision for outlay on nurses (not trained), chauffeurs, and waiters and waitresses. A comparable estimate of ours, based upon a consideration of occupations and using average pay derived from questionnaire returns by employment agencies, sets the outlay (exclusive of board and food) about \$580 million higher. Hence, under the present head

work in the field. The changes are, however, relatively minor and affect equally our measure of national income and hence the discrepancy to be accounted for

² The guessing involved here is obvious testimony to the difficulties of the procedure followed by Dr. Warburton. If our interpretation of the character of these particular items is correct, then all we are trying to do is to refine his measures to a point that makes them roughly comparable with the national income totals estimated by industrial origin.

the net accountable excess of Dr. Warburton's estimate over ours is about \$700 million.

Fourth, there is possible duplication between the gross value of rent and several other expenditure items in Dr. Warburton's estimate. Thus, some houses are rented with gas and electricity provided and included in the rent. Also, gross rental may include some of the outlay on paints and varnishes, listed elsewhere by Dr. Warburton under consumers' outlay; as well as part of the item entitled 'maintenance of highways and streets' (so far as the latter is not already covered by the \$3 billion excess in the estimate of the value of government services). These items, part of which may represent duplication with rent are, as listed in Table 11: paints and varnishes (\$237 million); gas (\$546 million); electricity (\$619 million); maintenance of streets and highways (\$456 million); water and garbage removal (\$350 million); and possibly cooking, heating, lighting and refrigerating equipment (\$694 million)—a total of \$2,902 million. Even if only 10 per cent of these items is covered under gross value of the various rent items, the resulting excess is \$290 million.

Adding the discrepancies from the various sources listed above, we find that the accountable excess of Dr. Warburton's estimate of national income over the estimate of the National Bureau of Economic Research totals \$10.4 billion, only a little more than a billion dollars short of the total discrepancy. Of course, the crude character of some of the calculations just made means that the accountable discrepancy may well be a billion dollars larger or smaller than the total of \$10.4 billion arrived at. But the general conclusion of the preceding discussion would stand, regardless of refinements that might be made in it: the discrepancy between Dr. Warburton's estimate of national income and ours is not puzzling. It can easily be explained. It is due partly to the inclusion by Dr. Warburton of some items that we exclude and partly to the larger values for some of the items in Dr. Warburton's estimate, arising either from rough methods, possible duplication, or, in the case of government services, from a different valuation basis.

Since gross national product is closely related to net national product or national income; and since the differences between our estimate of national income and that of the Department of

Commerce are easily accountable for, it follows that the calculations above, suitably modified, will serve to explain both the excess of Dr. Warburton's estimate of gross national product over ours, and the excess of Dr. Warburton's estimate of national income over that of the Department of Commerce.

2 COMPARISON OF ESTIMATES OF SERVICES NOT EMBODIED IN NEW COMMODITIES

We may pass now to a comparison of the estimates of services not embodied in new commodities, a component for which the discrepancy between Dr. Warburton's measure and ours is greater than for any other broad component of the national product. For 1929, Dr. Warburton's estimate for this item (\$33.0 billion) exceeds our estimate (\$22.5 billion) by \$10.5 billion (Table 3). This discrepancy is due, in large part, to factors already discussed. The omission from our estimate of imputed rent on farm homes and of income from boarders and lodgers; the larger magnitude assigned by Dr. Warburton to paid and imputed rental on non-farm properties; the excess in his estimate of the value of government services; the possible exaggeration in his estimate of such items as the value of medical, amusement, etc. services, as well as the possible duplication between the gross rental and other items, are all relevant to the present comparison. The only item discussed in the preceding section that does not affect the comparison of estimates of services not embodied in new commodities is the value of alcoholic beverages and narcotics, which contains no direct service element. Thus of the sources that accounted above for a discrepancy of \$10.5 billion, one, which contributed \$3.0 billion, does not bear upon the comparison of estimated outlay for services not embodied in new commodities. But the remaining \$7.5 billion go far toward reducing the discrepancy between Dr. Warburton's and our estimates.

This still leaves an unaccounted excess of \$3.0 billion of Dr. Warburton's estimate of value of services not embodied in new commodities over ours. But a substantial part of this difference may be due to the use of our estimate in the form of a single year value. The basic reason for our employing three-year moving averages rather than single year values was the realization that this particular estimate of services not embodied in new com-

modities, derived by us as a residual, was subject to erratic year-to-year changes. These erratic fluctuations result from differences in the degree of precision with which the subtrahend (consumers' outlay on commodities plus capital formation) and the diminuend (national income) reflect annual changes in the true totals.

It is, therefore, interesting to observe that our estimate, by the residual method, of services not embodied in new commodities was higher in both 1928 and 1930 than in 1929: \$23.5 and \$24.4 billion as compared with \$22.5 billion. The three-year moving average centered on 1929 is \$23.5 billion; and it may be said that at least \$1 billion, and perhaps \$1.5 to \$2.0 billion, of the unaccounted excess of Dr. Warburton's estimate over ours is not to be considered significant.

The remaining discrepancy of \$1 to \$2 billion cannot be accounted for. Whether it is due to our underestimate or to Dr. Warburton's overestimate of services not embodied in new commodities, in excess of the allowance suggested in the preceding section, cannot be stated with any degree of assurance. But even were this shortage in our estimate real, an error amounting to between 5 and 10 per cent of the total is hardly an adequate basis for declaring the residual method to be as unreliable as Dr. Warburton asserts.

It is not my intention to claim general virtues and advantages for the residual method. Its weaknesses were stated in the published volumes. But it is pertinent to note that a residual method involving two relatively accurate and comprehensive estimates may be as good as, or better than, a direct estimate based upon inadequate data. A comparison of Dr. Warburton's direct estimate of services not embodied in new commodities with the residual estimate of the same component provides no basis for a judgment that the latter is any less reliable than the former.

If we disregard its erratic year-to-year behavior, the most important disadvantage of the residual method is not the presumptive inaccuracy of the global totals it yields, but the fact that it provides no breakdown among services of various types. Had Dr. Warburton stressed this disadvantage, I should have been the first to concur with him. And it is, of course, this particular consideration that calls for support of Dr. Warburton's fourth

general observation, the recommendation of a detailed study of the nation's output of commodities and services.

3 COMPARISON OF OTHER COMPONENTS

The other components in the comparison may be discussed briefly. The measures for the outlay on perishable commodities are approximately the same in both Dr. Warburton's estimate and ours. The excess of the former, appearing in Table 3, is due exclusively to the inclusion of alcoholic beverages and narcotics.

The combined total of semidurable and consumers' durable commodities is larger in our estimate than in Dr. Warburton's by some \$2.3 billion (Table 3). This excess is due largely, but not entirely, to the difference in the estimates for passenger autos, tires and tubes, and auto parts and accessories (Table 5). For passenger cars we make no allowance for business purchases; for the other commodities the percentages allocated by us to ultimate consumers are substantially higher than those allowed in Dr. Warburton's estimate.

The basis of our allocation between business and ultimate use for tires and tubes, and auto parts and accessories is similar to that for other commodities: census data, checked and amplified in the light of review by experts. Hence a question arises only with reference to the failure in our estimate to allow for any business use of passenger autos. Two comments may be made upon this decision. The first is that it was in line with the treatment of many other finished commodities in which there was marked preponderance of either business or ultimate use, and in which no definite basis of allocation was available. In all such cases the commodity was put in the category of preponderant use. And if in the case of passenger autos it resulted in an exaggeration of the outlay by consumers, in the case of certain producers' goods the result was to underestimate outlay by consumers. But it is probable that the net result, as indicated in the published volumes, is to exaggerate somewhat the volume of outlay on consumers' durable goods.³ The second comment is to the effect that the exaggeration that can be definitely imputed to our estimates of semidurable and consumers' durable goods is relatively minor; and that it results from the same lack of data that explains why

³ See *Commodity Flow and Capital Formation, Volume One*, p. 467.

two estimators, Dr. Warburton and Mr. Lough, both proceeding along similar lines, produce estimates that are a billion dollars apart.

The difference between Dr. Warburton's and our estimate of net capital formation seems to be due largely to discrepancies in the measure of capital consumption and in the estimates of net changes in inventories. Dr. Warburton discusses the sources of these discrepancies in detail, and there is little need to go over them again here. But it may be noted that his statement of the adjustment for changing inventory valuation (point 7, Sec. II, 4) is confusing. The important point is that no measure of inventory changes as part of capital formation can be derived unless and until inventories are reduced to identical price levels at each of the two year-ends. No direct comparison of inventories as they are given in business accounts is, therefore, feasible in any measure of capital formation that defines the latter as part of the flow of commodities and services.

4 GENERAL OBSERVATIONS

In the light of the discussion above, Dr. Warburton's general observations can be reformulated as follows:

1. In general, for specific commodities few significant differences are observed between the estimates of Dr. Warburton and those of the National Bureau of Economic Research. The larger total of consumers' outlay obtained by Dr. Warburton is due to: (a) inclusion of some items for which no reliable continuous estimates are possible; (b) inclusion of income from some illegal activities; (c) use of cost instead of taxes-paid basis in valuing government services; (d) apparent overvaluation of some direct service items and possible duplication in others. Of these sources, the one under (a) is quantitatively the least important.

2. The estimate of the value of consumers' outlay for services not embodied in new commodities, as the residual between estimates of national income and those of the value of commodities, is not appreciably different from the direct estimate of these services, when differences in the coverage and basis of valuation are taken into account. With the present poor supply of direct data on services not embodied in new commodities, the direct method seems to yield results that seem no more reliable than

those of the residual method, so far as global quantities are concerned. But the residual method suffers from two disadvantages. It is subject to erratic year-to-year changes and it cannot yield a breakdown among various types of services.

3. The total value of consumers' outlay on commodities and services, plus the net value of capital formation, as estimated by Dr. Warburton, is several billion dollars larger than the estimates of national income prepared by the Department of Commerce and the National Bureau of Economic Research. But this discrepancy is easily accounted for by the sources (a) to (d) listed under point (1) above.

4. A new comprehensive investigation of the value of the nation's output of commodities and services is urgently needed, at least for recent years, including 1929. With the present supply of data it cannot be hoped that this investigation will yield results that can serve as a check upon measures of national product derived from income payments and business savings by industrial sources. But such an investigation would provide a useful apportionment of the national product between consumption and capital formation, and reveal various subcomponents of the former.

III M. A. COPELAND

Dr. Warburton has done a signal service in comparing his estimates of national income and the gross value product of the community, made on the value-of-ultimate-products basis, with Dr. Kuznets' estimates of these series, using the net-value-product formula. Dr. Kuznets notes certain difficulties in localizing, on an industrial basis, the differences between the two sets of estimates. First, he notes that certain industries whose net-value product is omitted from his estimates, have a gross value product of \$5.2 billion which is included in Dr. Warburton's figures. He *guesses* that the net value product of these industries would be about \$4.5 billion. Second, he notes that Dr. Warburton includes the entire gross value product of certain service industries, although a part of their product should have been treated not as an ultimate product but as an intermediate service consumed by

other enterprises. Dr. Kuznets *guesses* that the amount of the gross value product in such service industries, which is improperly counted as a part of the ultimate value product, is about \$1.3 billion.

On several previous occasions, I have urged the desirability of having, for one or more selected years, a complete detailed check of the two methods of estimating national income and gross value product against each other, or what comes to the same thing, the desirability of having an estimate by both the debit net value product method and the credit net value product method for every industry. Such a check would provide comparable estimates of both gross value product and net value product for each industry group and also a breakdown of the gross value product of each industry group into value of ultimate and of intermediate products. When such a check is open to us, we ought not to resort to *guessing*.

IV CLARK WARBURTON

Dr. Kuznets states that three of the four general observations at the close of my paper seem to be either contradicted or not supported by the tabular comparisons presented in the paper. The validity of one of the three observations—namely, that a careful analysis is needed of the difference between my estimate of the national income and those prepared by the Department of Commerce and the National Bureau of Economic Research—is evident from the space devoted by Dr. Kuznets himself to that very analysis.

Dr. Kuznets rightly points out that the difference between his estimate of national income and mine is due to two types of factors: (a) omission from his estimates of items I have included; (b) differences in the estimates of the value of the various commodities and services. However, his comparison of the two estimates is inadequate, for he has only partly explored the reasons for the \$11.6 billion, or 14 per cent, excess of my estimate of national income in 1929 over his own. Dr. Kuznets' list of items included in my estimates but not in his seems incomplete. I have been unable to find in *Commodity Flow and Capital Formation*,

Volume One any allowance for cut flowers and plants, or for the cost of meals sold by restaurants in excess of the retail value of the food consumed. My estimates of consumers' outlay upon items omitted by Dr. Kuznets are given below. In this connection I have ignored Dr. Kuznets' comment that part of the value of alcoholic beverages is included in his estimate, for the reason that his estimates for other commodities must be too high by a compensating amount. Figures are in billions of dollars.

ITEMS INCLUDED IN WARBURTON'S ESTIMATES BUT NOT IN KUZNETS'

<i>Commodities, total</i>	49
Alcoholic beverages and narcotics	38
Cut flowers and plants	02
Cost of meals in restaurants in excess of retail value of food consumed	09
<i>Services, total</i>	15
Imputed rental value of farm homes	07
Imputed net rental value of rooms in private homes and lodging houses	08

My comparison in Table 6 regarding the evaluation of services for which Dr. Kuznets does not give specific estimates needs revision in the light of the figures given in his comments. The revised figures, in billions of dollars, are given below.

	KUZNETS	WARBURTON
<i>Total value of services not embodied in commodities</i>	225	330
Deduct		
Services incl. by Warburton but not by Kuznets (imputed rental value of farm homes and of rooms in private homes and lodging houses)		15
Items incl. in both estimates for which Kuznets gives specific estimates (rent of nonfarm homes, imputed rental value of owner-occupied nonfarm homes, and domestic service)	108	122
Government services to individuals	18	49
Balance, value of services incl. in both estimates but not separately evaluated by Kuznets	99	144

Dr. Kuznets has mentioned certain service items for which my estimates are substantially higher or lower than his. He has failed, however, to give sufficient attention to commodity items for which his estimates are substantially higher or lower, mostly higher, than mine. These must obviously be taken into consideration not only because they are important items of difference

between the two estimates but also because failure to take them into account minimizes the difference that must be accounted for elsewhere.

The list below covers the differences between Dr. Kuznets' estimates and mine of the value of those commodities and services for which we have both prepared specific estimates. I have attempted to enumerate each item showing a difference amounting to more than a quarter of a billion dollars. The figures for services are based on those given by Dr. Kuznets in his comments on my paper.

ITEMS FOR WHICH KUZNETS' ESTIMATES ARE HIGHER THAN WARBURTON'S		
	DIFFERENCE	
	BILLIONS OF DOLLARS	PER CENT
<i>Consumers' commodities, total</i>	4.3	
Food and non-alcoholic beverages	0.4	2
Coal	0.4	52
Soaps, cosmetics, etc.	0.3	51
Passenger automobiles	1.2	57
Automobile tires, tubes, parts, and accessories	0.8	142
Other commodities, net excess	1.1	6
<i>Consumers' services, total</i>	0.6	
Domestic service	0.6	57
<i>Capital formation, total</i>	4.6	
Public structures	0.3	13
Machinery and equipment (excl. passenger automobiles for business use)	1.8	39
Net change in inventories (incl. farm animals and stocks of silver and gold)	2.4	1670
Net change in investment abroad	0.1	41

ITEMS FOR WHICH WARBURTON'S ESTIMATES ARE HIGHER THAN KUZNETS'		
	DIFFERENCE	
	BILLIONS OF DOLLARS	PER CENT
<i>Consumers' commodities, total</i>	0.9	
Clothing materials	0.6	39
Tobacco	0.3	16
<i>Consumers' services, total</i>	1.9	
Rent of nonfarm homes	0.4	9
Imputed rental value of owner-occupied nonfarm homes	1.5	31
<i>Capital formation, total</i>	4.3	
Residential buildings	0.5	17
Business structures (excl. transportation and public utility)	0.3	11
Transportation and public utility structures	0.7	36
Passenger automobiles for business use	1.1	
Capital consumption (excl. farm animals), excess of Kuznets' estimate over Warburton's	1.7	17

With the foregoing data we are in a position to summarize the elements making up the \$11.6 billion difference between Dr.

Kuznets' and my estimates of the national income in 1929. The items for which my estimates exceed his are marked plus, and those for which his estimates exceed mine, minus. The figures are in billions of dollars.

<i>Net excess of Warburton's estimate of national income in 1929 over Kuznets'</i>	+11.6
Items not covered by Kuznets	+6.4
Difference in method of treating government services	+3.1
Services not embodied in commodities for which Kuznets does not give separate estimates (i e., covered only by the residual between his estimates of national income and of consumers' outlays and capital formation)	+4.5
Net difference resulting from differences in evaluating specific items, accounted for as follows:	-2.4
<i>Items evaluated higher by Warburton than by Kuznets, total</i>	+7.1
Consumers' commodities	+0.9
Consumers' services	+1.9
Capital formation	+4.3
<i>Items evaluated higher by Kuznets than by Warburton, total</i>	-9.5
Consumers' commodities	-4.3
Consumers' services	-0.6
Capital formation	-4.6

These figures support the observations at the close of my paper to which Dr. Kuznets objects. In the first of those general observations, I stated that my evaluations of the cost of specific commodities to ultimate consumers were more conservative than Dr. Kuznets'. As indicated above, my estimate of consumers' outlay for commodities for which Dr. Kuznets also estimates such outlay is \$3.4 billion, or 7 per cent, smaller than his estimate. My larger figure for total consumers' outlay, I stated, was due to more inclusive coverage, direct estimation rather than use of a residual process for evaluating consumers' services, and use of the cost rather than the tax basis of evaluating government services. These three differences, as indicated above, amount, respectively, to \$6.4, \$4.5, and \$3.1 billion. Even though these estimates were to be reduced by about \$2 billion in accordance with Dr. Kuznets' suggestion that he may have attributed a part of the value of the omitted items to other commodity items and that I may have included some duplication in the service items, these

three factors would still be responsible for my larger estimate of total consumers' outlay.

My second general observation to which Dr. Kuznets objects—namely, that the evaluation of consumers' outlay for services as the residual between estimates of the national income and those of outlay for consumers' commodities and capital formation is unreliable—is also reinforced by the more detailed analysis presented here. After eliminating the items—rental values and domestic service—which are not included in Dr. Kuznets' estimates or for which he has given specific estimates in his comments, his method gives a value of \$9.9 billion for items I have evaluated at \$14.4 billion and Mr. Lough at \$16.5 billion. My estimate for these items is 45 per cent, and Mr. Lough's, 67 per cent, larger than Dr. Kuznets'. Only three items estimated directly by both Dr. Kuznets and myself, excluding items for which our allocations to consumer and business use differ substantially, show as great a difference, and these three (soaps, cosmetics, etc.; domestic service; and change in inventories) are items for which the direct estimates have a low degree of reliability.

Dr. Kuznets further suggests that to maintain a consistent position I should have included consumers' outlay on the services of prostitution, gambling, bribery, and similar industries. With this I agree, and since Dr. Kuznets thinks I have indulged in guesses of doubtful reliability with respect to the value of alcoholic beverages and other items, and he himself does some 'guessing' in his comments on my paper, I shall venture a guess that these and other omitted items are of the order of magnitude, in 1929, of from \$3 to \$5 billion.

One other comment of Dr. Kuznets requires mention here. He thinks that some of my estimates, particularly those relating to medical service, are too high because the items are in part paid for by business enterprises rather than by individuals. This contention is of dubious validity, since such payments by business enterprises may be looked upon as compensation to employees, in addition to money wages or salaries, or in the case of contributions to community chests and philanthropic institutions, as a part of the value of the product of business concerns which is distributed to beneficiaries of the contributions rather than to

stockholders or employees. As Dr. Hart points out, many such expenditures constitute a genuine twilight zone between income and business expense, but in my estimates I have deliberately included in income a somewhat larger proportion of this twilight zone than has Dr. Kuznets.

These considerations lead directly to a question I did not specifically ask in my paper, but to which my paper was in part directed. How large a proportion of national income, defined as the aggregate value of all commodities produced and all direct services rendered during the year minus that part of the nation's stock of goods which was expended in producing this total, is covered by the estimates of the National Bureau of Economic Research and the Department of Commerce? Though the National Bureau and the Department of Commerce, in their publications on national income, have pointed out that their coverage is not complete, those estimates have been assumed to be more reliable, as estimates of the amount of the national income, than they actually are.

To indicate the extent to which the national income estimates of the National Bureau and the Department of Commerce may be too small, let us combine Dr. Kuznets' estimates of the value of the commodity and service items for which he has prepared specific estimates with my estimates and guesses for the items omitted or not specifically evaluated by Kuznets. The result, in billions of dollars, for 1929 is given herewith. These figures may be compared with Dr. Kuznets' estimate of \$83.4 billion for

Kuznets' estimates of the constituent items of national income he specifically evaluates

Consumers' outlay for commodities	50 8
Consumers' outlay for services (from his comments on my paper)	10 8
Capital formation	10 1

Warburton's estimates of constituent items of national income not specifically evaluated by Kuznets

Government services to individuals	4 9
Other consumers' services evaluated by Kuznets only as a residual	14.4
Consumers' commodities and services incl in Warburton's estimates but not in Kuznets'	6.4
Consumers' commodities and services omitted from both estimates	3.0 to 5.0

Total value of commodities produced and personal services rendered during 1929

100.4 to 102.4

national income in 1929 and the Department of Commerce estimate (latest revision, *Survey of Current Business*, June 1939) of \$82.3 billion. They suggest that those estimates may understate the net value of all commodities produced and personal services rendered during the year by as much as 15 or 20 per cent. Perhaps, as Dr. Kuznets insists, the figures of the National Bureau and of the Department of Commerce include nearly all the items for which the preparation of annual estimates is feasible. However, the wide margin between those estimates and the one just presented provides added emphasis to Dr. Copeland's comment about the desirability of having for one or more selected years a complete detailed check of the estimates of national income derived by summing on the one hand, the amounts of income drawn by individuals from each industry, and on the other hand, the value of the various commodities and services produced.

Part Six

SOME PROBLEMS
INVOLVED IN ALLOCATING
INCOMES BY STATES

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Discussion

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SOME PROBLEMS INVOLVED IN ALLOCATING INCOMES BY STATES

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A WIDESPREAD and growing demand for income data for geographic divisions of the country comes from a great variety of business, research, and government sources.¹ Since in general it is not very articulate as to precisely what information is desired or what geographic unit is to be used, the investigator must determine for himself just what he can provide in response to what he considers the needs. He will be guided in part by the nature of the source material. The concepts and scope of income estimates for the United States as a whole have become fairly well standardized and the differences that persist are usually reconcilable. Seemingly these same methods should lend themselves to the determination of income for geographic divisions with no added difficulty. However, the very act of making geographic allocations and emphasizing relative magnitudes raises many new questions and enlarges existing problems.

In this paper an attempt will be made to raise and discuss several questions concerning the various purposes for which state income estimates might be prepared, the items to be considered

¹ The Income Section of the Department of Commerce recently released estimates of state income payments which include wages, salaries, interest, dividends, entrepreneurial income, net rents and royalties, direct relief, Social Security benefits, and the soldiers' bonus. See R. R. Nathan and J. L. Martin, *State Income Payments, 1929-37* (National Income Section, Division of Economic Research, Department of Commerce, May 1939). This Bulletin can be obtained on request. The Department plans to publish a volume later this year or early in 1940 presenting the estimates in considerable detail and discussing the concepts, scope, sources, and methods underlying the figures.

for inclusion or exclusion for the different purposes, problems of a conceptual nature, sources and methods of estimation, the use of states as geographic divisions for the apportionment of income, and the qualifications that must be considered in interpreting the figures. Although it may not be the most logical sequence, the paper presents these questions in the order listed.

I Purposes of State Income Estimates

The uses for which estimates of income for the various states may be prepared are many. It is important for the estimator to have in mind the objectives of his study since the concept and scope of the estimates will vary considerably depending upon the particular uses to which they are to be put. A variety of income figures might be developed for each state and each set of estimates would be useful for limited purposes. In suggesting different estimates for various uses, problems of measurement are largely disregarded in this section but will be considered later.

1 MARKET ANALYSIS

From the viewpoint of the government and particularly such an agency as the Department of Commerce, state income estimates should be designed to include information helpful to business enterprises for the purpose of market analysis. Advertising agencies and firms that distribute their commodities nationally are eager for information that indicates the magnitude of, and the changes in, the purchasing ability of individuals in the various states and in smaller geographic divisions. For this purpose, the estimates should presumably include all the monetary receipts of individuals available for current expenditures within the state. Even with such a seemingly simple concept it shortly becomes apparent that the precise scope of appropriate figures is difficult to define.

If income received were confined to compensation received for services rendered, serious limitations would attach to the estimates, primarily because of transfers of income across state lines. Thus, dividend recipients or wage earners in one state make gifts to individuals in other states. Remittances by persons to relatives

for dependents in other states exercise a significant influence on the purchasing capacity of residents of certain areas. Thus, in the District of Columbia there are many government employees who send part of their earnings to dependents in their home states. On the other hand, many hopefuls come to the District of Columbia in search of jobs and require remittances from the folks back home pending success in their quest for a government position. Similar forces are at work in other large cities. (Remittances from parents to students in out-of-state schools and colleges involve a rather substantial transfer of funds. (Such transfers of income may not affect the total social income or the total purchasing ability of all persons in the United States but in addition to influencing the size distribution of income, they may exert an important influence on the total purchasing power of individuals within limited geographic areas.)

In considering interstate transfers of income as an influence on purchasing power, some thought must be directed toward the treatment of the transfer of assets as well. From the viewpoint of possessing command over goods and services, the recipient of funds or goods that were a part of the current income of the giver is in the same position as the recipient of funds or goods that were part of the cash accumulation, receipts from the sale of assets, or goods of the giver. Inheritances may have the same effect on purchasing power as gifts which find their source in current income. Perhaps it will be necessary to classify interstate transfers of income and wealth on the basis of their probable use by the recipients in order to determine whether to include the receipts as contributions to purchasing power where received. Similarly the alternative uses by the transferer of the income or wealth to be transferred must be considered in order to give proper attention to necessary deductions from aggregate purchasing power where the transfer originates. These considerations apply, at least in part, to intrastate as well as to interstate transfers.

The sale as well as transfer by gift or inheritance of assets across state lines may be a factor in determining income available for current purchases of goods and services. Capital transactions within a state would not affect total purchasing power since the receipts of the seller would be offset by the absorption of the purchasing power of the buyer. However if a resident of one state

sells his assets to a resident of another state, total current or liquid purchasing power in the former state is expanded. Of course, all assets possessing marketability are in themselves purchasing power, having command over other goods and services.) The owner of a house has as much purchasing capacity as the one who has just sold his house and possesses cash, provided neither or both intend to use the house or cash for purchases of other goods and services. The net withdrawal or deposit of funds in banks or other savings institutions by individuals might influence net funds available for current purchases depending upon the use to be made of the withdrawals or alternative use of the deposits and upon the effect of these deposits or withdrawals upon bank investments. Subjective elements are clearly important in evaluating the effects of transfers of claims to assets. 'Purchasing power' might well form the basis for a paper in itself and the discussion here is designed to point out some of the problems involved in the scope of income estimates for marketing analysis rather than to discuss purchasing power itself fully. Asset transfers are on the whole disregarded in this paper, which deals primarily with the current flow of income and, to a minor extent, with transfers of income.

Some question might also be raised concerning the exclusion from income estimates for market analysis of portions of income that are contractually obligated for specific purposes such as life insurance premiums, Christmas savings accounts, or reserves to meet legal obligations such as taxes. Here again it seems apparent that rigid standards of inclusion or exclusion would find little agreement among different users of the figures. In the case of installment credit, some might suggest including the credit as purchasing power when granted and then deducting the installments when paid from current income of the debtor.

Other problems also affect the validity of estimates of income received in the various states as measures of purchasing power. Individuals may receive their income in one state and make expenditures in other states. Thus, during the winter vacation season, the income of the regular residents of Florida is substantially supplemented by the expendable funds of tourists who received their income in other states. The expendable funds of the regular residents in the home states of these vacationists is cor-

respondingly reduced. To a less extent, goods purchased by direct mail also involve a movement of spendable income across state boundaries. Also many market areas cross state lines, as illustrated by the New Jersey and Connecticut residents who do much of their shopping in New York City. Thus, the estimates of income received, usually confined to receipts of residents in each state, are not precise measures of funds available for purchases or of actual purchases in specific areas.

Income in kind is also important in this connection. This factor is particularly significant in agricultural states where a substantial proportion of the total income of the farm population is received in kind, principally in the form of commodities produced on the farm and consumed by the farm family. Such income is of and in itself a command over these very goods but it is not the kind of income to which the business community looks for sales possibilities. Imputed income from owned durable consumer goods falls in this category. Of course, imputed income and income in kind increases the availability of the cash income of farm families for the purchase of goods other than those included in the income in kind.

The size distribution of income is a very important factor in determining marketing opportunities of different commodities and the nature of the income concept adopted would have a very important influence upon the size distribution of that income among the residents of any particular state. Thus the inclusion of gifts in the income of the recipient and their exclusion from the income of the giver would in itself effect a substantial change in the pattern of the size distribution.

2 ECONOMIC WELFARE

A very important use of income estimates for geographic divisions relates to the development of measures of general social and economic welfare. The figures desired for this particular purpose, though closely related to those developed for marketing uses, should give more attention to non-monetary income. The estimates should certainly include imputed income from the ownership and use of consumer durable goods, especially housing. No doubt the proportion of houses owned varies considerably from state to state and the inclusion of imputed income from owned

houses would yield different results from state to state than would monetary income alone. Also desirable, but probably less susceptible to measurement, would be income derived from housewives' services and from functions performed by individuals for themselves or for other members of the household. Very likely the proportion of laundering, cooking, and similar services performed within the home as compared with commercial enterprises or hired help varies considerably from one region to another, thereby limiting the comparability of estimates confined primarily to income derived from the production of goods and services for sale in the market.

Perhaps estimates of income consumed are even more significant as measures of economic welfare than are estimates of income received. Income consumed within a state should include the value of goods and services consumed by individuals within that state, probably confined to consumption by regular residents so that the income and number of persons or consuming units will be comparable.

If the estimates of income received were used as evidence of economic welfare and were to serve as a basis for the allocation of public assistance grants by the Social Security Board or of jobs by the Works Progress Administration, it would seem desirable to exclude Social Security benefits or work relief earnings. Also it might be desirable to exclude expenditures by individuals that do not necessarily relate to the value of benefits received, and substitute the value of the benefits received. Federal taxes might thus be deducted from income received and, if possible, estimates of the value of government services might be added. Limitations attaching to the total and per capita dollar income estimates as evidence of welfare will be discussed later.

3 TAXATION

If the income estimates are to be used directly in determining tax yields or, indirectly, to study the incidence and burden of taxation, the concept of income received should conform to, or be adjusted so as to conform to, the definitions of the existing or proposed tax base. Such estimates, depending upon tax provisions, would probably exclude all relief and charitable receipts but would probably include inheritances and insurance benefits,

particularly the excess of insurance benefits received over premiums paid to insurance companies. Realized capital gains and losses should be incorporated in accordance with the provisions of the revenue laws of the state.

If the income figures were confined to taxable items under existing laws and were shown separately for each type of taxable income, such estimates would obviously be useful only in each state individually. On the other hand, if the estimates were designed to provide a basis for determining potential income tax receipts from state to state on the basis of uniform tax laws, the figures would be comprised of all the items the tax estimator considered as properly subject to assessment. The size distribution of income would be essential for tax studies and here again the nature of the distribution would be influenced by the concept of income adapted. Varying size distributions on the basis of different inclusions would be most valuable in studying tax proposals, particularly if the tax rates were to be graduated.

4 PRODUCTIVITY

There is considerable interest in information bearing upon the economic productivity or output of one area as compared with another. Estimates of the net value of product of each state would provide a measure of the economic importance of the various states as contributors to national income. Classified by industrial source, these figures would measure not only the relative importance of different industries in the economic life of each state but would also make it possible to analyze economic fluctuations within the state on the basis of its industrial structure.

Some insight into the economic interdependence of the various states would be gained from studying measures of the net value of product in relation to the interstate flow of goods and services. Also important is the comparison of the net value of product with measures of other income concepts. Frequent expressions are heard to the effect that certain states, particularly those in the South, 'produce' a much greater supply of goods and services than are available for consumption by their residents. The validity of such comments can be tested only after the development and

interpretation of appropriate measures. These will be discussed in greater detail in the following sections.

Perhaps too much emphasis has been placed upon the different uses to which income estimates might be put, but such a discussion makes possible a rather realistic consideration of some of the more important items that might be included in or excluded from income estimates. It demonstrates the problems of concept and scope involved in the development of state income figures and should serve to make the estimator 'label his ingredients' and the reader 'use with care'. For each purpose there may be one or more concepts of income and for each concept there may be a variety of uses, but obviously there is no one concept suitable for all purposes.

II Concepts of Income

The National Bureau of Economic Research and the Department of Commerce have defined national income or income produced for the country as a whole as "the net value of all goods and services produced in the United States" or as "the gross value of all goods and services produced minus the value of raw materials and capital equipment consumed in the processes of production". Also, national income has been defined as "the value of goods and services consumed plus or minus the value of changes in the national wealth resulting from current production activities", both after adjustment for the international flow of goods and services. The concept of income produced, which, for the purposes of state estimates, might be called 'the net value of product', seems to be a useful measure for industrial and geographic subdivisions as well as for the entire nation.

Income paid out as used in the Department of Commerce estimates is defined as "the compensation paid to individuals or aggregates of individuals for services rendered" and includes salaries, wages, other labor income, interest, dividends, net rents and royalties and entrepreneurial withdrawals. This measure is useful for determining the relative importance of the different factors of production as evidenced by income paid by producing units for the services of each factor. Income paid out differs from

national income by positive or negative business savings; positive when business enterprises retain part of the net product and negative when business enterprises disburse more than they produce.

The Department of Commerce has developed a third series entitled 'income payments to individuals' which might better be termed 'income received by individuals' provided the figures were more fully developed. They differ from income paid out in that certain items that accrue to but are not actually received by individuals are deducted and other items that are actually received by individuals but do not represent payments for services currently rendered are included. Thus, income paid out includes the payroll taxes under the Social Security Act, whereas income payments exclude these assessments but include benefits received by individuals under the provisions of the Social Security Act. Also, income payments include direct relief disbursements, which are not counted as part of income paid out.

Another income concept which, as previously stated, seems particularly useful in the development of state estimates might be termed 'income consumed' and would consist of the net value of product *derived from* economic activity within the state less the value of the net outflow of goods and services from the state and minus the value of net increases in wealth within the state (the latter two may be positive or negative).

III Allocation of Net Value of Product

At this point certain theoretical aspects of these concepts should be considered. Perhaps the most important relates to the geographical allocation of the net value of product. Questions of measurement will be taken up later. First it is necessary to establish certain criteria for the allocation of income by geographic areas.

In general, the basic income measures may be divided into two broad categories, one concerned with income as received by individuals and the other with the net value of product of economic activity. The significance of different measures of income received, varying in the items to be included, has been discussed in

some detail earlier in this paper, and aside from the matter of scope, these estimates seem to involve no great conceptual problems.' The geographic allocation of income produced or the net value of product does, however, raise serious problems of a fundamental nature.

A simple illustration may make it possible to understand clearly one problem involved. Let us assume that an individual residing in New York has considerable means and wishes to make an investment. He decides to invest his funds in the building of a plant in North Carolina for the manufacture of men's clothing. Plant, equipment, and raw materials are purchased with the funds provided by the New York investor and are located in North Carolina. At the end of a year's operation the net value of product of this particular plant might total \$100,000. Let us assume that the entire net value of product is distributed and \$80,000 goes to the employees in the form of wages and salaries and the other \$20,000 to the absentee owner in New York who has provided the necessary capital. In an attempt to allocate national income, or the net value of product, by states on the basis of these facts, would the entire \$100,000 be credited to North Carolina or would only \$80,000 be credited to North Carolina and \$20,000 to New York?

Obviously, the physical process of making the men's clothing out of raw materials took place in North Carolina. The capital equipment consumed in their production was there and the labor services of North Carolina residents were applied in that state. As to the factors of production, labor's contribution was made in North Carolina, but the capital contribution was made in New York if the situs of ownership might be said to be the place of contribution, or in North Carolina if the actual location of the capital equipment is accepted as the place where the contribution was made.

Perhaps the significance of geographic areas should be considered further. Is any particular importance to be attached to a geographic area as such, or is the important determinant the persons within the confines of a certain place, or more particularly, the residents of a territory? Seemingly a territory apart from its residents has limited significance and allocation would be more fruitful with reference to the geographic location of indi-

viduals rather than territorial boundaries as such. With this in mind, the question arises, is there any point in determining the net value of goods and services *derived from* economic activities taking place within the physical confines of North Carolina or any other state when this net product is *derived by* residents of other states as well as by residents of North Carolina? This question has more than mere academic importance in these days when conflicting economic interests seem to be arising anew in different states and are manifesting themselves in trade barriers of one kind or another. Complaints to the effect that much of what is 'produced' in southern states is taken away by northern interests who have 'foreign' claims upon it can best be analyzed by understanding all the implications of such statements and by presenting appropriate data.

In view of these considerations, it would seem more important, *if a choice were necessary*, to allocate the net value of product by states on the basis of such a concept as 'the net value of product *derived by* residents of a state from their labor and from the services of their property, wherever located', rather than on the basis of the concept of 'the net value of product *derived from* the resources of labor and wealth employed in a state'. The former measure would, in the illustration used, allocate \$80,000 to North Carolina *residents* and \$20,000 to New York *residents*, whereas the latter measure would assign the entire \$100,000 to *the state* of North Carolina. The results of the former choice would be identical with assigning the net value of product to the location of the residence of the one making the contribution to production, assuming that the capital contribution is made at the situs of the owner or investor. The estimate of net value of product derived by the residents of any one area would then be equal to the income for services rendered that is received by or accrues to residents of the area.

If the person, as a contributor of his capital to production, is the primary force rather than the capital itself, then the 'derived by' concept is more significant. On the other hand, if the actual capital equipment is regarded as the primary force, the 'derived from' concept predominates. Capital equipment accumulates through the investment and savings process, the savings representing an abstention from consuming all that is produced. By

saving, individuals acquire goods or claims thereto, and receive income for making the goods available for further production. Without savings the capital equipment would not exist and without the decision of the owner it would not be made available for further production. Therefore, the contribution of capital to production is the contribution of the owner and the product of its use should be allocated to the owner wherever he may be.

It should not be intimated that the acceptance of the measure of the net value of product *derived by* individuals in a state as the more important concept will satisfy everyone or that the *derived from* concept is of no value. Many feel that mere situs of ownership is irrelevant and incidental in the matter of income produced. They claim that the contribution of capital is made where the physical capital is located and that the yield of that contribution should be allocated to the state where the assets are located and not to the state of residence of the person possessing the claim to these assets. Further, it is pointed out that the proposed measure of income *derived by* individuals in a state is not indicative of the productivity of labor and capital residing in that state. If the investors were to move about frequently from state to state, there would be marked shifts in the figures whereas the goods and services coming into being within each state might remain unchanged.

If estimates are developed of the net value of product *derived from* economic activity in each state, they are likely to be interpreted in such a way that misunderstanding will increase. It is inevitable that the state as such, and its residents as such, will be used interchangeably and the figures will erroneously be used as measuring the value of output of the *residents* of each state. The conversion of these estimates to a per capita basis, also inevitable, would yield not only meaningless figures but ones that would be compared with per capita income received and would tend to further confusion and misinterpretation.

Perhaps a wrong impression is left after this discussion. It is not intended to imply that the 'net value of product *derived by*' concept is the only important one and that no use whatsoever can be found for measures of 'net value of product *derived from*' each state. Of the two concepts, which measure entirely different things, the former seems the more important. The latter is useful

'but it must be used with understanding. In tax studies, where the net value of product is the proposed base of taxation, such data would be exceedingly helpful, but here again any overall comparison of total receipts from taxes of all kinds with figures on the net value of product *derived from* each state would be misleading, for taxes are usually based on a variety of income concepts. If a geographic area were of economic importance as such, a measure of the output of the factors of production actually applied there would be important for determining the contribution of that area (not of its residents as such) to the national economy. States are entities primarily for administrative purposes and inherently have limited economic significance. The use of states as geographic divisions for economic studies is determined largely by practical considerations. The state income estimates for all concepts are thereby limited in usefulness but this limitation seems to reduce the usefulness of the 'income *derived from*' estimates more than that of other measures.

✓ In all this discussion, income attributed to the services of property has alone been considered specifically. The geographic allocation of net value of product might be further confused by the problems arising from interstate flow of wages and salaries. We may examine another instance which brings out this point more clearly. Let us assume that no one lives in Delaware and that there are no assets existing in that state (for the sake of simplicity, land is disregarded as a factor of production). Individuals in Pennsylvania make investments by purchasing machinery and plant which is then located in Delaware and all individuals employed in this plant reside in Pennsylvania. The question arises: Is any of the net value of product of this economic undertaking to be assigned to the state of Delaware?

Here we are confronted with determining not only the allocation of income resulting from the contribution of capital as a factor of production, but also the contribution by labor as a factor of production. Should labor's contribution to the production of goods and services be assigned to the place where the effort is expended or where the laborer resides? The only logical conclusion consistent with the suggested treatment of capital necessitates assigning the net value of product contributed by labor to Pennsylvania in the estimates of 'income *derived by* the residents

of a state' and to Delaware in the estimates of 'income *derived from* the labor and wealth employed in a state'. True, the contributor resides in Pennsylvania and makes his contribution in Delaware but the product of his efforts is derived by a resident of Pennsylvania. He can be looked upon as a person possessing a capacity to work. The person is a resident of Pennsylvania and owns the capacity to work, which capacity is applied in Delaware.

In this particular example, the question might well be asked: What would be the use or importance or real meaning, aside from industrial source and type of payment analysis, which may have no significant relation to state lines, of figures that measured the net value of product *derived from* economic enterprise in Delaware? There are no residents there and no income is received there. No per capita income could be derived by dividing income by the number of residents, which is usually considered the first requisite step for comparative purposes. This extreme example illustrates the need for clearly defining and understanding different concepts and for properly interpreting the various measures of income.

IV Methods of Measurement

Many income items appear in a considerable number of different income estimates and it is perhaps more satisfactory to consider each item individually at this point rather than attempt to discuss methods of measurement for each income concept. Although any actual attempt to prepare estimates requires a determination of precise sources of data and methods of estimation, the discussion here is in more general terms and little detail is presented as to the limitations of source material.

I WAGES AND SALARIES

Data on wages and salaries are becoming increasingly abundant and estimates for these items on a state basis can now be prepared with a considerable degree of accuracy for most industries. (The basic data are most satisfactory for the larger industries and the margin of error usually increases with the decreasing relative importance of the industry.) In 1935 the Bureau of the Census

covered many new industries. Payrolls in covered industries totaled more than \$21 billion and accounted for more than 60 per cent of the total wage and salary bill of all industries in 1935. In the industries not covered a wide variety of source material may be used for determining base period estimates, including the 1930 Censuses of Occupation and Unemployment which make it possible to develop estimates of employment by industrial groups for April 1930. The limitations of the industrial classification of gainful workers, however, favor the use of these figures only if more direct employment and payroll data are lacking.

Some of the sources of data used by the Department of Commerce for developing basic estimates and for determining annual or monthly changes include various reports of the United States Office of Education, Interstate Commerce Commission, Bureaus of Mines, of Agricultural Economics, and of Labor Statistics, federal and state banking authorities, state departments of labor and industry, some confidential memoranda transmitting special tabulations, and questionnaires for certain industrial categories. In addition, estimates for specific states could no doubt be greatly improved through the use of data from state registration, licensing, job placement, and administrative bureaus. Old age insurance and unemployment compensation payroll data should prove invaluable.

A rather difficult problem arises concerning the interstate flow of wages and salaries. Most data on wages and salaries available from the various industrial censuses are for the state or locality where payments are made. For other industries, however, the source material does not provide direct figures and the methods of estimation yield figures on the basis of the residence of the recipient. For most of these industries the 1930 Censuses of Occupations and of Unemployment serve as a primary basis for geographic allocation of employment, to which average pay rates from related series can be applied.

By and large, most wages and salaries are received within the state where paid, but in certain areas this generalization definitely does not apply and the resulting per capita incomes (using the number of residents for deriving per capita figures) are inaccurate. This is particularly true in the case of the District of

Columbia where a great number of persons are employed who live in Virginia and Maryland. This situation also exists around New York City and Philadelphia. No doubt, there are more persons living in New Jersey and employed in New York City and Philadelphia than there are residents of these cities employed in New Jersey.

This problem of interstate payment of wages can be solved by making special studies of income recipients through mail or interview questionnaires or through employer payroll records in regard to the residence of workers. State tax statistics might contribute to the solution of this problem, particularly where the law provides for separate reporting of earnings from employment in other states or where employers must report on payrolls to individuals in other states. Perhaps an analysis of the wage records collected under the state and federal unemployment compensation and old age insurance provisions, relating the address of the recipient to the address of the employer might be helpful. Of course, such data would be needed only where adjoining areas in different states lead to the crossing of state lines by a substantial number of individuals in their daily travel to and from their places of employment. Traffic surveys of daily interstate travelers or data on holders of licenses for the use of connecting bridges and tunnels should prove enlightening. In addition to employees crossing state lines in regular travel from their residences to their places of employment, there are firms that always have some men traveling, whose checks are mailed to them. It is difficult to approximate the importance of this interstate flow of wages and salaries but the various approaches suggested above might furnish some indication.

2 ENTREPRENEURIAL INCOME

Statistical bases for developing estimates of entrepreneurial incomes are perhaps the least satisfactory of the available source material for various items in national income and would seem at least equally barren for the purpose of studying state income. Fortunately, for two areas in which entrepreneurial incomes are particularly important, agriculture and professional services, which in 1937 accounted for nearly two-thirds of this type of income, some direct information is available. The Bureau of

Agricultural Economics of the Department of Agriculture is now engaged in preparing income and expenditure estimates for each state. The 1929 and 1935 censuses of agriculture provide much useful primary material. In addition, the departments of agriculture of many state governments and universities have gathered considerable agricultural data which make it possible to determine fairly accurate net income figures. For many professions the Department of Commerce has conducted questionnaire surveys which, while not entirely satisfactory for all states because of the small samples, nevertheless provide some basis for determining the net incomes of individuals engaged in independent professional practice. For other industries it may be necessary to adopt general assumptions, such as that the net income of entrepreneurs is the same as the average wages and salaries of employees in identical industries. Perhaps in the near future, data on net income of unincorporated enterprises will be collected by the Bureau of the Census or else field surveys on income, such as the Consumer Purchases Study or the current Minnesota Income Study, will have sufficient coverage for the development of satisfactory estimates of this item. Special tabulations of individual income tax returns to be made on the present Treasury-Works Progress Administration project in Philadelphia should provide useful data.

It is proposed that business savings of unincorporated enterprises be disregarded in state estimates, assuming that the net income and no more or less, is withdrawn by the proprietor. In the first place the national estimates of business savings of entrepreneurs are highly conjectural and the state figures would probably be even less accurate. Second, from a theoretical viewpoint, there are arguments favoring the use of net income as withdrawals and regarding business savings of entrepreneurs as nil, as well as arguments favoring the breakdown of entrepreneurial net income into withdrawals and business savings. It is no doubt true that during periods of prosperity assets are built up by leaving savings in the business, while during depressions assets are reduced by withdrawals in excess of net income. On the other hand, it may be argued that the entrepreneur and his enterprise are inseparable, that he withdraws his entire net income, that during prosperity the entrepreneur, in the role of an individual,

makes new investments in his business, and that during depressions he compensates himself only to the extent of his net income, and that additional amounts withdrawn represent disposition of assets by him as an individual, similar to the sale of securities by a stockholder. According to these arguments, savings of entrepreneurs are more closely related to savings of individuals than to corporate savings. The theoretical and practical difficulties involved in this problem are not easily overcome and are the subject of continuing thought and analysis.

3 DIVIDENDS AND INTEREST

The estimation of dividends and interest brings to the fore not only the problem concerning source material, but also the question of where they are to be counted. (In the case of wages and salaries they were treated as being received where paid, thus assuming away the question of where they should be included. Were we to attempt to estimate the net value of products *derived from* certain areas and were the estimates to be determined by first estimating income paid out and then adding corporate savings, it would be necessary to allocate dividends, interest, and corporate savings to the states where the capital equipment was in existence. This would be almost impossible. In the first place, data on net income, dividend and interest payments, or corporate savings are not available for all states in accordance with the location of the physical plants.) The state tabulation of corporation income tax returns by the Bureau of Internal Revenue is by the states in which the returns were filed, which is where the principal place of business or principal office of the corporation was located.

Many corporations have plants throughout the country and dividends and interest are paid from the place of incorporation or the principal offices in one state. No estimates are available on the value of corporate assets located in the various states and even if such overall or industrially classified figures could be had, they could be used for this purpose only by adopting many arbitrary assumptions. A partial solution lies in having figures on the value of corporate assets in each state for each company; even then it would be necessary to assume that for a company engaged in many activities, the assets in each state contributed proportion-

ally to the net product. Actually some products or processes are more profitable than others and the assets of one corporation in different states are frequently used to produce different products. Income tax returns under many state revenue laws provide for allocating the net income of interstate corporations to the particular state on the basis of one or more items, such as assets, sales, and payrolls. These allocations could be accepted if consistent from state to state, recognizing, of course, the limitations mentioned above. Not all states have income tax laws, and in those states that have such statutes, the definitions of net income and the bases for allocating net income of interstate corporations are not consistent. Obviously, this is a very difficult problem.

On the other hand, if the suggested concept of the net value of product *derived by* individuals in each state is adopted, we can allocate at least dividends and interest to the state of residence of the recipient with a fair degree of accuracy. The problem of allocating corporate savings geographically is almost impossible under any concept. Even if we were to assume that corporate savings should be allocated geographically on the basis of the location of the owner of the property, it would be unsatisfactory to make this apportionment on the basis of dividends. Data on dividends received by states are not available on the basis of industrial source and the relation between corporate savings and dividends varies considerably from industry to industry. Also, dividends are certainly not a satisfactory basis for the allocation of corporate savings when savings are negative and a great number of corporations have paid no dividends. Certainly it cannot be assumed that the stockholders in every state hold stock of the same industrial distribution or that their dividend record is uniformly favorable or unfavorable from state to state. Nor is it likely that positive or negative savings will be distributed geographically in accordance with the holdings of securities on which dividends are paid. These limitations make doubtful the possibility of preparing estimates of the net value of products derived either from each state or by the residents of each state.

If dividends and interest are to be estimated according to the location of the recipient, it is necessary to resort to the use of data provided by the Bureau of Internal Revenue in its annual publication, *Statistics of Income*. About 70 per cent of the esti-

mated total dividends flowing to individuals directly or through insurance companies, building and loan associations, savings banks and other organizations considered as 'aggregates of individuals' are reported as received by individuals who submit federal income tax returns. The annual *Statistics of Income* present data on dividends received by individuals in each state and thus provide a basis for allocating this 70 per cent by states.

For general purposes, it would seem that the other 30 per cent of dividends unaccounted for by income tax returns could be apportioned state by state on the basis of the geographic distribution of the 70 per cent. This assumes that the indirect flow of dividends to individuals through the savings organizations mentioned above would be in the same proportion from state to state as are the dividends reported by the higher income recipients. The error arising from this assumption is probably not very large, particularly in relation to the total income figures in each state and even in relation to total dividend income. Insurance policies, savings bank accounts, building and loan association deposits, and similar evidences of savings are held by persons in both the higher income and the tax exempt brackets and, with some exceptions, these holdings are probably distributed in somewhat the same way geographically as are holdings of securities by individuals. In Delaware these claims are probably less important relatively to direct security holdings than for the rest of the country and probably more important, relatively, in California.

The unaccounted residual is presumably received by individuals whose incomes fall below the level necessitating the submitting of income tax returns. There is no known way of even rationalizing as to whether the geographic distribution of this amount is identical with the geographic distribution of dividends received in the higher brackets. Again, Delaware seems to be an exception with a larger portion of dividends received in the upper income brackets than for the country as a whole. The error in total per capita income by states would probably be slight were it assumed that the geographic distribution of this residual paralleled that of the 70 per cent accounted for on income tax returns. For more specific purposes, this assumption might be entirely untenable.

Considerable further study of source material might make

possible refinements obviating the necessity of the assumption that dividends not accounted for in federal income tax returns are distributed geographically in the same manner as those so reported. If the magnitude of dividends received by the different 'aggregates of individuals' is determinable for the country as a whole, they might be apportioned by states on the basis of legal reserves on insurance outstanding in each state and on deposits in savings banks, building and loan associations, and other savings institutions. Intensive analysis of existing data should yield some information on the total dividend receipts of each of these types of organizations in the United States.

As to the dividends received by the individuals in the exempted brackets, there are good prospects for fruitful analyses in the various state studies now in progress or already completed. Wisconsin receives several times as many individual income tax returns as are submitted by its residents to the federal Bureau of Internal Revenue. This is the result of a lower exemption under the state law and different filing requirements. The Wisconsin data should provide excellent material for analyzing the proportion of reported dividends appearing at different income levels as well as the relation of dividends to other income items or to total income at the different income levels. Results of the Delaware income tax project, where the tax returns of practically all income recipients of the state are being tabulated for 1936, should yield interesting evidence on this problem. Likewise, studies of the composition of income in the various income levels, as reported in the Consumer Purchases Study and as will result from the Minnesota Income Project, should prove helpful.

Estimates of interest received by individuals in different states are subject to a greater margin of error than are the estimates of dividends received, since the proportion of the estimated total interest paid to individuals and aggregates of individuals in the United States, which is reported on federal income tax returns of individuals, is much smaller than that of dividends.) The Bureau of Internal Revenue reports taxable interest received by individuals by states annually. Unpublished data on tax exempt interest received by individuals in the different states is in the hands of the Bureau of Internal Revenue, but its completeness in any one year and the consistency of coverage from year to year and

from state to state are to be doubted. The aggregate of the tax exempt and the taxable interest receipts as reported by individuals submitting federal income tax returns accounts for only about one-fourth to one-third of the total estimated interest paid to individuals and the aggregates of individuals from 1929 through 1936. The assumption that the rest is distributed geographically in the same proportion as the reported receipts is obviously subject to a substantial margin of error. It is no doubt true that a substantially larger segment of total interest than of dividends flows to individuals through aggregates of individuals rather than directly. Therefore a study of these savings organizations, suggested above for dividends, is even more desirable for the interest item. The various state studies should also provide basic data upon which to base needed refinements in the estimates.

4 OTHER ITEMS

The only figures available on a geographic breakdown of rents are those reported by individuals on income tax returns. Pending a thorough revision of the estimates of net rents now in progress by the Department of Commerce, it is not possible to give an accurate percentage that the rent received by income tax reporters bears to total rent received by individuals or aggregates of individuals.

As pointed out in discussing the theoretical aspects of allocating income by geographic divisions, the problem of allocating corporate savings by states is difficult and does not seem to lend itself to satisfactory treatment for all states. However, where state laws require data on the value of assets located within the state these figures might be of some use in an attempt to allocate savings to the state where the physical plant is. Both the dividends and corporate savings of an interstate corporation might be allocated to a particular state on the basis of the ratio of the value of physical assets in it to the value of total physical assets of the corporation. This apportionment assumes uniformity of profitability or of contribution by assets from state to state. A satisfactory allocation requires a very detailed cost accounting system for operations in each state for each corporation with plant and equipment in more than one state.

A further question of a theoretical nature is involved in allocating corporate savings: should corporate savings be assigned exclusively to the holders of equity capital? If corporate savings are held to accrue exclusively to the stockholders, then the suggested allocation could be made on the basis of the geographic distribution of the stock according to the residence of the stockholders, or on the basis of the location of the physical plant and equipment, depending upon the concept adopted. Some believe that business savings should not be considered as accruing to equity holders alone. Adherents to this viewpoint would state that if corporations were required to pay out only what they produced, no more and no less, the share of the net product going to the different factors of production would not be the same as when savings are assigned to the stockholders. In order to prepare estimates of the net value of product *derived by* residents of each state, business savings would have to be allocated to some group or groups to whom it is held to accrue.

Whatever concept is adopted, serious limitations will, apparently, attach to the allocation of income produced by states because of the lack of satisfactory data for allocating business savings. An attempt to allocate business savings on the basis of the residence of the equity holders ('income derived by' concept) would be more difficult and lead to a greater degree of statistical error than would the allocation of business savings on the basis of the location of the plant and equipment ('income derived from' concept). However, even the latter approach cannot at this time be followed for all states, but only in those where state income tax laws require data upon which the allocation can be based; even then the figures will be subject to many limiting factors.

Work relief and direct relief payments can be apportioned by states without a great deal of difficulty although for the early part of the Federal Emergency Relief program and before 1933, the distinction between work relief wages and direct relief payments is not very clear and some approximations are necessary to separate the two items. For other labor income, particularly compensation for injuries, satisfactory reports are available for some states and less suitable reports for most of the others. However, refinements must frequently be made because of the way in

which self-insurers are reported. Private pension payments are relatively minor in importance. They should be allocated on the basis of the geographic location of the recipients of the pensions. The same practice should be followed in allocating pensions to war veterans. In both private pensions and compensation for injuries, the estimates of income received by individuals should include actual payments to individuals in each year, while for estimates of the net value of product, only the contributions of employers to these funds or reserves in each year should be included. Further, if employees contribute to private pension plans, their contributions should not be considered as part of the wage and salary item in the estimates of income received by individuals.

Many other items such as gifts, inheritances, insurance benefits, and other interstate transactions were mentioned earlier as factors in determining the purchasing power of the citizens of any particular area. There is practically no information available today on the flow of these transfer items from one state to another and it would seem necessary to rely entirely on questions relating to these items to be gathered by sample surveys of families, such as the Consumer Purchases Study and the proposed income project of the Minnesota Resources Commission which provides, among other plans, for a field survey of a sample of urban and rural families in Minnesota. It would be necessary not only to determine receipts from the recipient, but also to have data on payments at their source. Perhaps, as the basis of a check, it would be desirable to ask the recipient not only how much he got in the form of a transfer of a certain type, but also the residence of the one who made the gift. Also, the giver could be questioned about the residence of the recipient.

No attempt has been made in discussing the method of measurement to explain specifically the derivation of any particular item in any particular industry. It is apparent that wages in manufacturing would in general be derived for alternate years from the biennial Census of Manufactures. Obviously these data would have to be interpolated on the basis of payroll indexes for the particular state. For the many industries not covered by censuses related data would have to be used. Thus, for water transportation, traffic data might prove useful, or for domestic

servants, records of United States Employment Service on placements, registration, and starting wages would be very helpful. For certain hand trades, license bureaus within the states might provide very valuable information. Innumerable other sources can be found and the degree of accuracy attained will depend in large measures on the industry and ingenuity of the estimator in ferreting out direct data and in developing reasonable relationships with other series when direct information is not available.

V Inclusions and Exclusions

It might be well to summarize the items that would appear in various types of income measures. (For estimates of the net value of product, or income produced, the same items would be included as appear in national income figures.) wages, salaries, interest, dividends, entrepreneurial withdrawals, net rents and royalties, and business savings. Also incorporated in the estimates would be work relief wages and other labor income which represent part of the current wage bill to employers. For income paid out, which is useful for measuring the relative compensation to the different factors of production, only business savings would be excluded from the items comprising national income.

In estimates of income payments to individuals, or what might better be termed 'incomes received by individuals', numerous other adjustments must be made. For wages and salaries, all payroll deductions at source, namely those items which are included in census and other payroll reports and which accrue to individuals but are not immediately received by individuals, should be deducted. These include social security assessments on both the employer and the employee, assuming that the original source data for salaries and wages included these assessments. Also, contributions by both the employer and employee to private pension systems or sick benefit associations should be deducted; again provided they are included in the basic figures. All benefits paid to individuals under the unemployment compensation and old age insurance provisions of the state and federal Social Security programs should be added. Also, payments from private industrial pension funds to pensioners should be included.

- In the estimates of income received, no change would be made in the estimates of entrepreneurial income or in net rents as used in the income produced or income paid out series. Thus it is assumed that the entrepreneur receives only his net income from his business, no more and no less. This necessitates the further assumption that during hard times when the entrepreneur depletes his business assets, he is disinvesting just as the wage earner uses his savings and the security holder sells his security for procuring the means of livelihood.

However, for dividends and interest, it seems advisable to substitute income actually received by individuals from the 'aggregates of individuals' for the dividend and interest income flowing to 'aggregates of individuals'. In other words, dividends and interest received by savings banks, insurance companies, building and loan associations, and other collective savings institutions would be deducted from the estimates of dividends and interest used in the income produced and paid out series and in their place actual disbursements by these institutions to depositors or policyholders would be substituted, not however including those disbursements which represent a return of capital.) The latter differentiation makes such a correction almost impossible until more information is available on the flow of funds through aggregates of individuals. Of course it might be suggested that for these institutions, such as life insurance companies, the net excess of benefits over premiums should be included. This, however, means including funds from the liquidation of assets, and to be consistent it would be necessary to include net withdrawals from savings accounts, net receipts from the sale and purchase of assets, and related items, the inclusion of which is very questionable, as already stated.

In the present annual national income and income paid out series and the state and monthly income payment figures of the Department of Commerce it is presumed that dividends and interest received by the aggregates of individuals are in turn, though not immediately, paid to individuals. It is apparent that, in the case of an insurance company, the actual payments to individual beneficiaries for death claims, annuities, or on any other basis, do not in the aggregate represent as much as the original premiums plus all the dividends and interest received by the in-

insurance company. The difference represents loading charges. Presumably, the insurance company pays out to individuals all that the individuals have paid in, plus the dividends and interest received by the insurance company, and further, the individual pays back part of his receipts to the insurance company for the investment and insurance services the company rendered him. Or, looking at it in another way, we might say that only part of the original premium represents an investment; the other part represents a payment to the insurance company for services rendered. Insurance benefits then represent a repayment of that part of premiums which represented an investment plus returns on that investment. The loading charges are like payments for any other services, i.e., doctors' bills or theatrical admissions, and appear in part in the wages, salaries, and other final income payments by the insurance company. It seems impossible to apportion the two-way flow of funds between insurance companies and individuals as between the portion representing loading charges, the portion representing investment or disinvestment, and the portion representing returns on investment.

Of course, there are gradations others might care to adopt which might result in the inclusion or exclusion of only some of the items listed above. It is particularly important to emphasize again that the items to be included or excluded in estimates of income received will depend in large measure on the uses to which the estimates are to be put; one concept will not serve all purposes.)

VI Interpretation of State Income Estimates

There are so many qualifications attaching to the meaning of state income figures and statistical limitations involved in their estimation that one might, at first blush, question the reward for the long and tedious effort required in their preparation. On the other hand the various uses and purposes outlined in the first section of this paper will in large part be satisfied by the estimates that can be developed, especially if the user is aware of the factors essential to proper interpretation.

While the states are not suitable economic units, they are,

singly or in groups, first approximations to broad economic entities. As administrative units for tax purposes, enactment of laws of an economic nature, and related matters, they are not entirely devoid of economic importance. The income measures will in themselves reveal the industrial structure of the various states and will make possible combinations of states of a more or less homogeneous nature and comparisons of like and unlike states. While geographic regions with more significant economic boundaries would be desirable, a breakdown of income by states will be a step in that direction.)

Perhaps the most important single matter to be considered in interpreting the estimates is the difference between different areas and groups in living standards and costs. The layman's first impulse is to view a higher per capita income in one state as indicative of a proportionately higher standard of living. This interpretation is not, however, justified since living costs vary from one area to another and within one area from one community or part of a community to another. Account must be taken of these price differentials.

Still more important is the fact that certain goods and services that make up part of the consumption pattern in one area are entirely absent in another area. Attendance at legitimate theaters, meals in restaurants, heating equipment in every house, and similar items are more or less regular types of consumption in any large northern city but are largely absent in a southern rural community. The same variations in consumption exist within states from urban to rural areas and even within cities from prosperous to slum areas. It is extremely difficult to derive a formula for converting incomes to a common denominator that would make possible precise comparisons for welfare purposes. Therefore the figures themselves must stand largely as they are and qualitative factors be considered in their interpretation.

These factors include differences among states between the urban and rural population as well as the color and racial composition of the population. The urban-rural breakdown should encompass size-of-community classifications for the urban residents and the proximity of the rural residents to larger communities. Climatic conditions are important in determining differences in fuel, housing, clothing, and even food require-

ments. Other elements for consideration include the pattern of the size distribution of income; the scope of services performed by government units; economic activities performed within the home or on a purely cooperative basis; differences in age distribution and in the employable proportion of the population; variations in the skill, education, and energy of the workers; availability of natural resources; and other matters of more or less importance.

In the derivation of per capita figures, the Bureau of the Census estimates of population can be used but the allocation of persons is not always coextensive with the allocation of income. This is obviously true for estimates of income *derived from* a state, but it is also true of income received. As previously noted, many persons work in one state but are counted by the Census as residing in another state and, unless the income figures can be shifted over to the state of residence (or *vice versa*) the per capita figures are in error. A significant portion of the District of Columbia payroll should be shifted to Virginia and Maryland. There should be some adjustments in population figures for transients. When a large group of transient workers enter a state for work during the harvest season, they are for the time being both residents and income recipients. Data for such adjustments are not readily available. There is the further question of large property income recipients who maintain residences in several states and whose property income is assigned to the place where their income tax return is filed. This place may or may not be the same as the residence reported to the Census Bureau.

Other problems may arise in the mind of the reader but these will serve further to illustrate the need for careful consideration of the limitations of state income estimates. The purpose of this paper is not to provide answers so much as to raise questions that will stimulate further thinking on these matters and lead to quantitative investigations relating to the more significant problems.

Discussion

I SIMON KUZNETS

Income measures are tools to be used rather than works of art to be contemplated. Their efficacy must be judged in the light of the applications to which they have been or may be put. Mr. Nathan has therefore prefaced his presentation of the problems of allocating income by states by a discussion of the purposes of state income estimates. In the light of the purposes singled out for discussion he concludes that "it would seem more important, *if a choice were necessary*, to allocate the net value of product by states on the basis of such a concept as 'the net value of product *derived by* residents of a state from their labor and from the services of their property, wherever located', rather than on the basis of the concept of 'the net value of product *derived from* the resources of labor and wealth employed in a state'" (Sec. III). And while Mr. Nathan is careful to point out that net value of product derived from each state is still a useful concept, the tenor of the discussion is such as to minimize its usefulness. (Indeed, of the four groups of purposes submitted as ones for which state income estimates are utilized—market analysis, economic welfare, taxation, and productivity—the concept of net value derived from is found useless for the first two, misleading for the fourth, and useful possibly only for the third, that is, if and when the state uses this particular income concept as a basis for taxation.

In the absence of definite criteria of usefulness, controversies concerning the relative importance of different income concepts are likely to be futile. And I would agree with Mr. Nathan that in the light of the purposes stated by him little use can be found for a measure of income derived from productive agencies within each state. But it seems to me that his list of purposes is too narrow, being restricted largely to those for which state income measures have been used in the past and underemphasizing uses

to which such measures, if carefully compiled, might be put in the future. The comments below, intended as a supplement to Mr. Nathan's paper rather than as a direct disagreement with his statement, attempt to indicate the aims allocation of income produced by states may satisfy.

The uses of measures of income totals and of their components can be divided into three broad groups: analytical, evaluative, and administrative. By analytical we mean uses of income measures in attempts to establish stable relations in a changing universe, testable relations that would be valid over broad ranges of space and time. Representative examples are the employment of income estimates for such purposes as determining the factors that affect the growth and decline of the wealth of nations; of income breakdown by industrial sources to establish a common pattern of changing industrial structures in various capitalist nations. Evaluative uses are based upon particular interest in the productivity or welfare of a distinctive group, be it a nation, an economic class, an occupational group, or any other collective entity that possesses consciousness of kind. The measure of income is then used in an attempt to evaluate the relation between the group and the economic system at large, with reference to the group's contribution and returns. The welfare interpretation of income measures and the use of some types of apportionment (e.g., by urban and rural groups, or among various types of income payments) belong largely to this category. By administrative we mean all uses of income measures in which the latter are employed as a factor in determining policy, whether of public and semi-public agencies or of private enterprises. The purposes Mr. Nathan describes under taxation and market analysis belong in this category.

We may now consider, with reference to each of these three broad groups of purposes, the utility of allocating income by states, no matter which concept of income is employed; and particularly the utility of measuring income derived from productive agencies within each state (briefly, income produced).

The value for analytical purposes of allocating income by states lies in the fact that, like all breakdowns of larger totals, it may reveal effects of different combinations of factors and thus facilitate the isolation of the specific effects of each. Whether in-

come by states is treated as the independent variable that affects others or as a dependent variable affected by others, the establishment of the distribution by states may reveal a range of variation that can be associated with variation, within the same state units, of other factors. It may thus provide leads in the search for stable relations, the establishment of which is the final goal of all scientific analysis.

For this type of use the allocation by states of income produced has obvious value. If the analysis is directed at the factors that determine the production of income, at the relations that govern the amount of net income originating in the economic system, then it is the allocation of the total income produced by states that is needed. True, such allocation will not be useful for analytical purposes if confined to *totals* of income originated: it should be cross classified by industrial source, type of income, etc. But the desirability of such cross classification for analytical purposes holds, of course, not only for the state allocation of income produced but also for income received, consumed, etc.

For evaluative uses allocation of income by states is important so far as it makes possible a better judgment of the relations between distinct groups and the economic system of the country at large. Thus, if the inhabitants of North Carolina feel a consciousness of kind that makes them particularly eager to know how much they contribute and how much they receive, as compared with the rest of the country; if the same curiosity besets the inhabitants of a region or members of any other group that can be segregated by using state boundaries, then state estimates will serve to satisfy it and help form a more enlightened judgment.

It would seem, offhand, that since evaluative uses are grounded largely in the interests of a given group of people they call for state allocation of income *derived by* to the exclusion of allocations of income *derived from*. But this inference overlooks the possibility that consciousness of kind may extend to the productive resources to which a given group applies its labor; that inhabitants of a given state may have a sense of proprietary interest in the total output in whose production they participate; and that their judgment of the performance of the economic system in its bearing upon them may be largely dependent upon a comparison of their share with the total they assisted in producing.

This is especially the case when a group living in a given state contributes only one of the productive factors, the others being contributed by residents of other states. To refer again to the possible feeling of the South as an exploited region, its residents must obviously base their judgment not only upon what income they receive but upon a comparison of that income with income originating in the productive activity in which they participate. If we assume that all residents of the South are in receipt of service incomes only, whereas property income and business savings accrue to residents outside, the important questions that must be answered are: Is income produced in the South relatively smaller than in other parts of the country? Is the distribution of income as between service income payments on the one hand and property income and business savings on the other substantially different from that in other parts of the country? I believe that Mr. Nathan suggests the need for this purpose of measuring both income *derived from* and income *received by*, although he does not make an explicit statement to this effect.

The utility of allocation of income by states for administrative purposes is obvious. The very fact that states are jurisdictional and administrative units makes it important to have such income measures not only for purposes of public policy but also for use by private agencies. The activity of private agencies is affected by the existence of these administrative units; and their boundaries can conveniently be used in order to plan activity of such enterprises as are endowed with a wide market and must rely not only upon intuition but also upon measurable and recordable knowledge.

It is also obvious that these uses may demand the allocation of income produced or derived from no less than income received or derived by. If state governments perform functions for the protection and welfare of the residents, they also protect and encourage the productive properties within the state. It is but natural that in considering sources of state revenues, income originated within the state should be considered a basis for taxation. For market analysis total income received is a more useful measure than total income originated. But it must not be overlooked that for the marketing of such commodities as capital goods, parts of income originated, such as business savings, may

be a much better guide to possible demand than any of or all the components of income received by state residents.

This discussion suggests the possible uses of allocation of income originated by states. It does not consider the difficulties that would arise in any attempt to arrive at such an allocation. That the main difficulty, allocating property and undistributed income to the place in which it originated, is formidable need not be denied. But some attempts to deal with it have already been made in administrative procedures. Also, in a considerable body of statistics this allocation is made implicitly, as may be seen from the fact that value added is given by the Census of Manufactures for various manufacturing industries by states.

Whatever the conceptual and statistical difficulties, the importance of the uses to which it may be put warrants careful consideration of the feasibility of allocating income by states within whose boundaries it originated. The difficulty of the problem should but serve as stimulus to early and serious scrutiny. It is to be hoped that the agencies concerned with state allocations will devote some time to experimenting with the problems of measuring income derived from productive agencies within the various states or within the boundaries of other jurisdictions.

Part Seven

INCOME AND
THE MEASUREMENT OF THE
RELATIVE CAPACITIES OF
THE STATES

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Discussion

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INCOME AND THE MEASUREMENT OF THE RELATIVE CAPACITIES OF THE STATES

P. H. WUELLER

THE MEASUREMENT of the relative capacities of the states to support selected services is rapidly becoming a major problem in federal-state fiscal relations.¹ The increasing attention it is receiving is in large measure attributable to the unprecedented increase in federal subventions to states² and to a strong feeling in some quarters that present procedures employed in connection with the allocation of federal grants among states are not satisfactory.³

In brief, the critics of contemporary grant allocation proce-

¹ The present writer wishes to mention his close association with J. T. Wendzel, Chief, Economic Studies Division, Social Security Board, Washington, D. C., while studying some of the related problems of income, fiscal capacity, and variable grants. For some time it has been the writer's privilege to act as fiscal consultant to the Social Security Board, and in that capacity he had the pleasure of close cooperation with Dr. Wendzel, whose broad knowledge of general theory has aided him materially in orienting his thought along specific lines with a view to directing it toward the solution of more general problems. Though indebted to Dr. Wendzel, the present writer assumes exclusive responsibility for the reasoning and tentative conclusions in this paper.

² In 1929 total federal subventions to states, expressed as percentages of state revenues, ranged from 2.4 for New Jersey to 48.4 for Wyoming. In 1934 the minimum and maximum percentages were 35.9 for California and 163.2 for South Dakota. See P. H. Wueller and Associates, *The Fiscal Capacity of the States: A Source Book*, Social Security Board, Bureau of Research and Statistics (2d ed.; Washington, April 1938), Tables S-I and IV.

³ Cf. *Report of the Advisory Committee on Education* (Washington, February 1938), Sec. B; also, *Report of the Byrnes Committee* (Washington, January 1939).

dures point out that present federal subventions partake of the nature of either non-matching ⁴ or constant ratio matching grants ⁵ and that neither device is likely to enable the relatively poor states to offer services of such quality or quantity as appears desirable to the critics. To overcome what they consider a socially detrimental situation, they suggest that contemporary techniques be replaced or modified by ⁶ the introduction of variable ratio matching grants.⁷ If the policy objectives of the advocates of variable grants are allowed, their insistence upon a change in federal allocation procedures seems justified. Non-matching grants may not elevate specific service standards substantially in the relatively poorer states, simply because the funds awarded may be used in lieu of, rather than in addition to, state appropriations. Federal constant ratio matching grants, on the other hand, while requiring the states to match federal funds as a condition of the award, in no way guarantee maintenance of service standards on a desired level. Even if we assume that the state accepts the grant and exerts a 'reasonable' tax effort by means of 'reasonable' tax levies, state service standards would, nevertheless, be limited by the resources of the state. The advocates of federal variable grants contend that the differences in resources of the states are such as to make the maintenance of 'reasonable' service standards impossible in the relatively poor states.

Inasmuch as the proponents of federal-state variable grants have found the device whose use they advocate ready-made in the fiscal tool chests of the states, it may be well to indicate briefly the nature of the type of variable grant that is at present used exten-

⁴ Non-matching grants may be defined as transfer payments from one jurisdiction to another, for a specified purpose, which, though their relative magnitude may be determined partly by indices of presumed need and capacity, do not require the receiving jurisdiction to match the funds awarded in any ratio whatever

⁵ A constant ratio matching grant is a transfer payment from one jurisdiction to another, designated for a specific purpose, which, as a condition of award requires the receiving jurisdiction to match the funds awarded *in some proportion*, the proportionality factor being constant for all receiving jurisdictions

⁶ Senate Bill, S 1265, 76th Cong., 1st Sess

⁷ A variable ratio matching grant is a transfer payment from one jurisdiction to another, designated for a specific purpose, which, as a condition of award, requires the receiving jurisdiction to match the funds awarded *in some proportion*, the proportionality factor being some function of a given receiving jurisdiction's need and fiscally exploitable resources

sively in state-local fiscal relations.⁶ The introduction of variable ratio matching grants by state legislatures arose out of an institutional situation in which certain public services were rendered by subordinate, though semi-independent, jurisdictions. The ratio of taxable resources to the cost of specific services varied among these jurisdictions in such a manner as to make it virtually impossible for some jurisdictions to attempt to finance a specified service of 'reasonable' quality out of tax bases designated for local exploitation. These grants provide that the matching ratio applicable to any one subordinate jurisdiction shall be some function of the specific need and resources of the grant receiving jurisdiction. Typically, the grants are so constructed that as the value of the specific need-resource ratio increases, the reimbursement fraction increases in some legislatively designated manner. The exact functional relation between specific need-resource ratio and reimbursement fraction is determined by the politically effective preconceptions obtaining in the larger community.

Generally speaking, the stronger the politically effective sentiment for equalization of service standards throughout the state, the more pronounced the tendency on the part of the state legislature to define service standards rigorously and to permit reimbursement fractions to vary with local specific need-resource ratios in such fashion as to facilitate the rendering of a standard service by all subordinate jurisdictions, provided these jurisdictions exert a 'reasonable' tax effort of their own. Whenever perfect equalization of benefits is the policy objective, state legislatures will not only define and make mandatory service offering as well as local tax effort, but also provide that the difference between the amounts produced by mandatory local tax effort and the cost of the prescribed service be met out of state funds. Such a subvention is usually designated an equalization grant.

Generalizing upon the various forces responsible for the introduction of grants-in-aid into state-local fiscal relations, it may be

⁶ For a descriptive catalogue of grant-in-aid formulae, see R. J. Hinckley, 'State Grants-In-Aid', State of New York, *Special Report of the State Tax Commission* (1935), No. 9. For a critical appraisal of the device, see State of New York, *Report of the New York State Commission of State Aid to Municipal Subdivisions*, Legislative Doc. No. 58 (1936), also, V. O. Key, *The Administration of Federal Grants to the States* (Chicago, 1937), and H. J. Bitterman, *State and Federal Grants-In-Aid* (New York, 1938).

observed that the desire for inter-jurisdictional transfers of tax funds was generated by public sentiment in a state as a whole insisting upon the general provision of a standard or minimum level of some type of service despite (a) a historically conditioned situation under which the operating functions coincidental to the performance of the service in question were actually performed by subordinate though semi-independent government agencies; (b) marked differences either in fiscally exploitable resources or levels of social consciousness, which, as the case might be, made it either financially difficult, if not impossible, or unattractive for some minor jurisdictions to offer services or facilities of the quality demanded by potent groups within the larger community. Typically, when the emphasis of the state legislature has been upon stimulation of local tax effort, constant ratio matching grants have been employed, and when the legislative intent has aimed at some degree of inter-jurisdictional equalization of service standards, variable ratio matching grants have been pressed into service.

When the agitation for federal-state variable grants began, students as well as policy makers attempted to follow the state-local procedure pattern closely. They set to work, attempting to measure the fiscal capacity⁹ of the states, by constructing so-called model tax systems, applying these systems to the economies of the different states, and measuring the states' fiscal capacities in terms of the differences in tax yields allegedly derivable from the economies of different states.¹⁰

With the passage of time, it was increasingly felt that this approach was unsatisfactory,¹¹ because, in essence, it defined the states' capacities to perform certain public functions in terms of the investigator's preconceptions regarding the proper relation

⁹ The term fiscal capacity may be tentatively defined as a given investigator's conception of the proper ratio of taxes collectible to some measure or selected measures of wealth

¹⁰ For an illustration of this procedure, see Mabel Newcomer, *An Index of the Taxpaying Ability of the States* (Bureau of Publications, Teachers College, Columbia University, 1935), also L. L. Chism, *The Economic Ability of the States to Finance Public Schools* (Bureau of Publications, Teachers College, Columbia University, 1936).

¹¹ J. R. Blough, 'Equalization Methods for the Distribution of Federal Relief Funds', *The Social Service Review*, IX (September 1935), 423 ff.

of the private and public economies of the different states.¹² Increasingly, the interest of those concerned with federal-state variable grants has shifted from attempts to define and measure the fiscal capacities of the states in terms of some necessarily higher subjective frame of reference to possible approaches to the proximate measurement of the states' capacities to support essential or desirable services regardless of whether these services are made available through the instrumentalities of the private or the public economies.¹³

In the following pages an attempt is made (1) to investigate the possibilities of using income as a basic gauge in approximating the relative capacities of the states, (2) to consider what seem to

¹² In passing, another serious methodological defect of the model tax system approach may be pointed out. All model systems are but idealizations of contemporary state-local tax systems. Hence, somewhat more than half of the yield of any one of the systems, when applied to the economy of a given state, is derived from capital base taxes. Capital value is essentially a long run concept, implying perpetuity. Contrariwise, fiscal capacity, to be of significance for variable grant purposes, must be essentially a short run concept, relating to some such period as one fiscal year or a few fiscal years. If capital values and fiscal capacity are to be related, the time periods with which either concept is associated must be made comparable. Formally, this may be done either (a) by associating the concept of fiscal capacity with a time period of indefinitely long duration, or (b) by adjusting the capital value or values in question, by introducing what may be called a liquidity coefficient. The first solution is meaningless relative to the problem in hand, because what is to be measured is possible tax effort, that is, the maximum ratio of taxes collected to some measure of wealth over a relatively short period. The second solution, while not meaningless, is cumbersome, unless one can conceive of a liquidity coefficient that is independent of the income that has been derived or has a high probable derivability in the immediate future. In addition, there is reason to believe that the model tax system approach involves double counting of the same wealth phenomena. For instance, in addition to the capital value base, represented in the main by realty taxes, the model systems operate with a personal income tax. To be valid, this procedure presupposes that the ratio of taxable income derived from real estate to all other taxable income is constant for all states. On the basis of the limited evidence available, it would seem that the assumption in question is not substantiated by observable facts.

¹³ In the present institutional set-up, the private economy would seem to differ from the public primarily by virtue of differences in motivating forces and the criteria by reference to which their respective operating efficiencies are judged. In the private economy the motivating force would seem to be the chance at profit realization and the operating criterion, the magnitude of the positive difference between out-payments and receipts. Contrariwise, the motivating force in the public economy would seem to be the production of services that are not produced in desired quantity or quality in response to the profit motive and the performance criterion, the judgment of the politically effective sector of the social group, a judgment typically not susceptible to pecuniary acquisitive tests.

be some major problems attending current attempts to develop federal-state variable grant proportionality factors on the basis of differences in the incomes of the residents of the various states.

For purposes of first approximation, it seems useful to think of a definable social group as a closed universe whose *raison d'être* is the establishment of relations designed to facilitate the production and distribution of those goods and services its constituent parts consider essential or desirable. If we postulate the desirability of maintaining the group's capital intact, the rate at which desired goods and services become available at an instant in time may be conveniently thought of as being measured by the rate of flow of income produced at that instant.¹⁴

Though for some operations the concept of income produced is useful, it seems inadequate for the purpose of approximating the relative capacities of the states, simply because it is not in its entirety allocable among the states.¹⁵ If a jurisdictional locus is to be assigned to income, the concept of income paid out¹⁶ or personal income must apparently be utilized. The income paid out¹⁷ that accrues to the residents of a given state measures the

¹⁴ Income produced may be defined as the market value of all commodities produced plus the market value of all personal services rendered minus the market value of the fraction of the group's stock of goods that was destroyed coincidental to the production of both goods and services over a given interval Cf., Simon Kuznets, *National Income, 1929-1932*, Senate Doc. 124, 73d Cong., 2d Sess. (Washington, 1934), p. 1

¹⁵ This statement is not intended to imply that income produced could not be allocated among the states if one chose to postulate institutions basically different from those observable in the contemporary United States. Such allocation and actual transfer presupposes the establishment and enforcement of rules according to which it is to be made. The formulation of such rules implies that the market is superseded by some totalitarian authority that performs the allocation. This paper, however, proceeds on the assumption that the market is to be retained as the *primary* allocating agent of income. See R. R. Nathan, Part Six.

¹⁶ Income paid out is defined as the "money receipts and the money equivalents of the receipts in kind", which accrue to natural persons over a given interval of time. Cf., Kuznets, *op. cit.*, p. 1. The difference between income produced and income paid out over comparable intervals of time is measured by business savings, positive or negative.

¹⁷ For the sake of brevity, income paid out will henceforth be referred to as income. However, the general sentiment of the Conference on Research in National Income and Wealth has been to reserve the term 'income' for 'income produced' and to designate what has been called 'income paid out' by the term 'aggregate of income payments to individuals'. See *Studies, Volumes One and Two*.

rate at which goods and services become available to its residents in both their individual and collective capacities.¹⁸

If the above considerations are allowed to stand, personal income accrued to the residents may be looked upon tentatively as a measure that makes it possible to compare the relative capacities of different states. However, before the possibilities of comparing the states by means of the income measure are considered in detail, it seems necessary to introduce an institutional complication. So far the argument has proceeded on the assumption that the income accrued to the residents of a given state may be devoted entirely to the purposes of the state's private and public economies. This assumption, though convenient, does violence to the facts, because the federal government draws upon these incomes by means of federal taxes.

If it could be safely assumed, as apparently it sometimes is,¹⁹ that the ratio of federal tax collections to the income of the residents of the states is constant, the impact of federal taxes upon the income of the residents would in no way affect the relative capacities of the states. However, the nature of federal levies, taken in conjunction with observable differences in the fiscally significant sectors of the frequency distributions of state incomes as well as differences in state institutions, lends credence to the belief that the impact of federal taxes upon state incomes varies widely.

Concretely, the severity of the impact of federal taxes upon the incomes of the residents of different states is influenced by

¹⁸ Strictly speaking, income paid out as defined above measures only the rate at which goods and services furnished through the money exchange economy become available at an instant in time. To get a more adequate measure of welfare levels, all goods and services furnished through channels other than the exchange economy could be added to the first. For purposes of measuring welfare levels or relative state capacities, the ideal concept would define income as "the algebraic sum of (a) the market value of rights exercised in consumption, and (b) the change in the value of the store of property rights" over an interval of time. Cf. H. C. Simons, *Personal Income Taxation* (Chicago, 1937), p. 50. Failure to take account of non-market economy services is likely to introduce an error into the determination of the relative capacities of the states, unless it can be established that the ratio of non-market economy goods and services to market economy goods and services is the same for all states. Students of national income have, however, strenuously objected to including changes in the value of existing property rights, i.e., capital gains, in national income. See especially *Volume One*, Part Four.

¹⁹ Senate Bill, S. 1265, *op. cit.*

numerous factors, such as (a) the frequency distribution of personal income within a given state; (b) the type of tax system which obtains in a given state; (c) a state's basic institutions.

Inasmuch as both federal personal income tax rates and federal estate tax rates are, respectively, increasing functions of personal income and net worth of estates, the ratio of federal income taxes and estate taxes paid and payable to income of residents increases as the positive skewness of the income frequency distribution increases. In other words, the fiscally significant sector of a state's frequency distribution of personal incomes is a determinant of federal tax impact. There is ample evidence that the value of this determinant is markedly different for different states.²⁰

Further differences in the impact of federal taxes upon the residents of different states reflect differences in the fiscal systems of the states in respect of the quantitative importance of special assessments or betterment taxes. Betterment taxes, in current practice, are deductible in determining liability under the federal income tax. Hence, as the ratio of betterment tax collections to total tax collections increases, the impact of the federal income tax upon the income of the residents of a given state decreases. Again, there is evidence that the impact of the federal estate tax is not uniform throughout. It is sometimes alleged that the Treasury, in determining the value of the real estate component of a given estate, is guided by and perhaps leans heavily upon local assessments. Hence, the market-assessed value ratios that prevail in a given state must be admitted as a determinant of federal tax impact. Last but not least, the impact of both federal personal income and estate taxes varies with the presence or absence of the institution of community of property in a given state. The relative importance of this factor cannot now be expressed quantitatively, although its presence in some states but not in others presumably tends to distort the picture. Likewise, the impact of federal excises can hardly be assumed uniform. To mention but one outstanding illustration, there are still some nominally dry states, despite the repeal of the eighteenth amendment.

²⁰ Wueller, *op cit*, State Table II, Alabama-Wyoming

The above instances are cited merely to cast doubt upon the apparently widely held belief ²¹ that the impact of federal taxes, can reasonably be presumed to be uniform throughout the states. It would not seem to require labored argument to show that, inasmuch as there is a strong presumption that the impact of federal taxes varies from state to state, all federal taxes paid out of personal income must be subtracted in order to obtain the income totals at the disposal of the residents of the states which measure their general capacity.²²

Comparison of total state capacities,²³ adjusted for differences in the impact of federal taxes, is not socially meaningful unless related to general need or presumed general need. It seems reasonable to assume for purposes of first approximation that general need, in contradistinction to a specific need or selected specific needs, is directly proportional to population. If this assumption is accepted, total income of residents, adjusted for net federal drains and divided by total population, or per capita income,²⁴ would seem to furnish the foundation for quantitative

²¹ Subscription to this belief seems to be implicit in the model tax system approach, for, in essence, that approach seems to proceed upon the assumption that the application of a given tax system to the economies of different states will abstract like percentages of the liquid wealth of different states. Cf. footnote 10 above.

²² The amounts of the income of residents of a given state abstracted by means of federal taxes during one interval of time accrue in the form of income to the residents of the same state or other states at a succeeding interval. In other words, if the time interval chosen for computation purposes is selected judiciously, the results of the computations for the different states will represent personal income of state residents minus net federal drains.

²³ The above definition of capacity implies that the market is accepted as the arbiter of state income allocation. It has been suggested from time to time that income originating is a superior criterion for the purpose in hand to income actually accrued. This view, of course, rejects the arbitration of the market, but fails to suggest a satisfactory substitute. In practice, the proponents of this view would urge that the income of the stockholders of an oil company originated, say, in Texas, and that part of it should have been kept in Texas in the first place by means of severance taxes. The advocates of this view, however, fail to specify the nature of the standard by reference to which they would determine how much should have been kept in the first place. In view of the contemporary scramble for revenues, there is good reason to believe that Texas, or for that matter any other state, keeps, in the first instance, as much as competitive conditions allow.

²⁴ See Nathan, Part Six, for a discussion of some of the statistical difficulties in obtaining per capita income.

approximation of the relative general capacities²⁵ of the different states.

According to this reasoning, per capita incomes as measured over a given interval indicate the relative general capacities of the states. When factored they may be designated collectively as the general capacity series or capacity index of the states. Interpreted in terms of more or less, this index makes possible the generalization that a state that is associated with a number of smaller value than some other state has a lower capacity than the second state. In other words, the capacity index, constructed on the basis of income accrued to the residents of the states over a past interval, facilitates measurement of the differences that obtained in the respective states' general capacities to satisfy competing specific needs over that interval.

Before possible uses of the index for federal-state variable grant purposes are considered, it must be pointed out that the index describes a situation that is in equilibrium, in the sense that during the interval in question the federal government has completely redistributed all tax funds collected during the interval. Hence, upon termination of the interval, the federal government is without funds to redistribute by means of variable grants or any other reallocation device. If the printing press is disregarded, all federal funds to be redistributed upon termination of the interval must be obtained either by (1) additional taxation or (2) the withdrawal of some federal subvention made during the interval by reference to which the capacity index was constructed.

If we assume that policy makers²⁶ decide to obtain federal

²⁵ The term general capacity may be defined as the effective power of a definable social group to satisfy competing specific needs on a certain level >

²⁶ Needless to say, the possible imposition of additional taxes presents problems of crucial importance which cannot be dealt with even tentatively in this paper. In passing, however, it may be pointed out that an intensive study of the state frequency distributions of income and the types of income disposition typically associated with different sectors of the frequency curve might aid considerably in approximating a rational solution. Such a study might make it possible to formulate tentative conclusions regarding the relation of modes of income disposition and economic progress—progress being defined as (a) an increase in the area under the income distribution curve, or (b) a lessening of the positive skew of the curve, or (c) some combination of (a) and (b)—thus laying the foundation for a rational fiscal policy, that is, a policy that given any objective whatever would be informed as to the means that could reasonably be expected to facil-

funds for reallocation among the states by means of additional taxation, it goes without saying that the capacity index must be adjusted to take account of the additional federal drains upon the incomes accruing to the residents of the states. Again, if we assume that the funds to be reallocated by means of variable grants are to be obtained by withdrawing a previously granted subvention, the capacity index must be adjusted to take account of the withdrawals.

Once the decision regarding the sources of federal variable grant funds has been made,²⁷ the properly adjusted capacity index, it would seem, could be utilized in connection with the determination of the variable grant proportionality factors, on the basis of which the federal government would match state appropriations for one service or for selected services. One simple solution suggested by the above argument would utilize the reciprocals of the components of the capacity index as proportionality factors.²⁸ Such a procedure is not only feasible but might be rational if the federal government made variable ratio block grants²⁹ to the states and permitted the states to budget the sum total of their receipts, including federal grants, as their judgment dictated.

state the attainment of the given ends. Ever since the publication of E. R. A. Seligman's *Theory and Practice of Progressive Taxation*, in the 'nineties, it has been an article of faith with legislators that the overall effective tax rate assessable against taxpayers should be some increasing function of income magnitude. It is suggested that while this view may have been entirely reasonable when taxes absorbed but a small fraction of national income, it is essentially static in the sense that it fails to consider the probable effects upon the future behavior of aggregate income and bears reinvestigation.

²⁷ If federal variable grant funds are obtained by the withdrawal of some current federal subvention, e.g., the present constant ratio matching grants, the cost of variable grants to the Treasury might conceivably be lower than the cost of currently made subsidies.

²⁸ The capacity index would apparently continue to serve a useful purpose even if the proportionality factors were not allowed to vary over so wide a range as might be indicated by the capacity reciprocals. The extent of the range over which it is desirable to allow proportionality factors to vary must be determined in large measure by (1) the decision as to the degree of equalization desired, (2) the sources of federal funds, (3) the probable sources of state matching funds.

²⁹ A variable ratio block grant may be defined as a transfer payment from one jurisdiction to another, which is not designated for any specific purpose, but which as a condition of award requires the receiving jurisdiction to match the funds awarded in some proportion, the proportionality factor being some function of a given receiving jurisdiction's general need and fiscally exploitable resources.

However, the use of the capacity reciprocals, when employed as proportionality factors in connection with the awarding of variable ratio matching grants for *specified functions*, implies subscription to the postulate that specific needs are proportional to general needs. Public opinion, whose dictum must be tentatively accepted, apparently does not subscribe to this proposition.³⁰ Nevertheless, it would seem that the capacity reciprocals suggested above could be put to use even though the proportionality of general and specific needs is not granted. Absence of proportionality, if more than an unsubstantiated claim, is measurable. *A priori*, there seems no reason to suspect that the measured specific need differences could not be associated with the capacity reciprocals. The combination of need differences and capacity reciprocals might then be used as proportionality factors in connection with the allocation of variable grants for specific functions, provided the reasoning that has led to the development of capacity reciprocals is accepted.

If the major considerations set forth above are granted, the following generalizations seem valid: (1) the problem presented by federal-state variable ratio matching grants is primarily a problem in territorial or jurisdictional income transfers, and, as such, implies the problem of personal income transfers; (2) inasmuch as the *raison d'être* of variable grants is income transfers, measured income differences must enter into the composition of the proportionality factors for which such grants provide; (3) state per capita income differences measure the differences in the states' general capacities to satisfy competing specific needs; (4) hence, the factored state per capita income reciprocals may serve as federal-state variable grant proportionality factors; (5) if differences in selected specific needs are not proportional to differences in general need, the deviations must be measurable, and, if measurable, they may be introduced as proportionality factor coefficients.

³⁰ Legislators, acting upon the assumption of proportionality when designing variable grants, would tend to generate a tendency toward proportionality. However, the philosophy that would make men act upon the proportionality assumption is the very antithesis of the philosophy underlying variable grants since the latter proceeds upon the assumption that inferior adjustments of population to resources are fixed data that must be compensated for rather than removed.

In conclusion, the writer would like to point out that his observations are not offered as *the* solution to the federal-state variable grant problem. Rather, he has essayed to define and relate what seem to him the significant variables that characterize the issue. If his suggestions stimulate further and better thought, he will have accomplished his aim.

Discussion

I GERHARD COLM

Dr. Wueller suggests in his thoughtful paper that variable matching ratios should be used in allotting grants and that the ratios should vary according to the capacities and needs of the states. He argues that general need can be represented by population figures and that capacity can be measured by income received. He therefore suggests that the ratios be modified according to a reciprocal index of income per capita for the various states. This proposal has the great advantage of simplicity compared with suggestions to base grants on more specific measurement of fiscal capacity and need. I agree with Dr. Wueller's proposal but wish to examine two possible objections.

First, it may be questioned whether income is really the best available measure of the capacity of a state. Dr. Wueller suggests this method as an alternative to the attempts to measure fiscal capacity by using a 'model system' of state and local taxation. I do not discuss here the adjustments of income received proposed by Dr. Wueller, but assume that he applies a measure of income at the disposal of individuals, business,¹ associations, and public authorities. Income received then seems adequately to measure the funds available for the satisfaction of public as well as private needs. The point has been made by Mr. Martin that although Dr. Wueller objects to the application of a 'model tax' system, such a system is implicit in his own proposal. It was argued that using income as a yardstick of capacity is justified only if individual income taxes are regarded as the ideal method of taxation, and if the possibility of business taxation is neglected. Such a criticism may be illustrated by the following example. Consider two states, A and B, whose residents receive the same

¹ Here only the non-distributed profits are to be considered

income. A has large factories which ship goods throughout the country and which disburse earnings to security holders throughout the country. B is a rural state with small scale production, where income produced is identical with income received. A's fiscal capacity is apparently greater than B's because A can increase its revenue at the cost of other states by various methods of business taxation. Such business taxes may either absorb some of the profits which otherwise would go to the security holders residing outside the state or, if prices increase because of these taxes, they may absorb consumer purchasing power. Dr. Wueller disposed of this argument by assuming that the revenues raised by such business taxes must appear somewhere in the income received; e.g., in the income of teachers or officials of that state. He assumes that "in view of the contemporary scramble for revenues" each state already taxes business "as much as competitive conditions allow". It might be concluded from this statement that an increase in such business taxes could not change the relative capacity of a state. To my mind such a conclusion would not be valid. It is true that a single state cannot increase business taxes without due consideration of the tax policy of competitive states. But if all states increased these types of taxes equally, it would not mean that the fiscal capacity of all states would be increased in the same proportion. States with relatively more productive facilities employed in interstate commerce and finance would increase their capacity more than states with predominantly local production or states in which many security holders reside. However, if the states make more use of this tax source for internal fiscal purposes the increased tax revenue will appear somehow in the income received (unless the money is spent for purchases from other states). Therefore it seems to me that the measurement of capacity by income received does not involve an implicit assumption of a model tax system, but that it is to a certain extent determined by the tax system actually used. This argument to my mind is not of very great practical importance. Possible objections against using either 'income produced' or a 'model tax system' seem of much greater weight. I therefore agree with Dr. Wueller's practical conclusion. 1

✓ A second objection might be raised against the assumption that the population can be used as a measure of general need. It

seems to me that there are differences in the costs required for satisfying public and private needs from state to state, so that a different portion of the capacity is absorbed in fulfilling the same type of service in various states. The costs of shelter are different in various regions. Different expenses are required for protection against cold, and similarly, the costs of government services differ between sparsely and densely settled regions, between rural and industrial areas, between plains and mountains. If a northern state shows income per capita four times as high as a southern state it would hardly be right to conclude that the northern state is four times as well equipped for fulfilling additional state functions. Yet, I hesitate to suggest that a direct measurement of general need should be applied as one variable in the matching ratio. The measurement of standard household costs in various regions is not yet sufficiently accurate for such a practical use and the measurement of standard government costs has hardly been attempted. Until much more progress has been made in this respect, the use of per capita figures as an approximation seems justified.

The use of income per capita as the basis of variable matching grants has two defects. First, such an index makes no allowance for the fact that it is more difficult to collect money from individuals with a generally low income level than from wealthy individuals or large corporations. It may be assumed that this tendency acts against the states with low incomes per capita.

On the other hand, the omission of the direct measurement of general, private and public need may act against the interests of the wealthier states since there is some reason to suppose that in these states costs for private and public goods and services are higher than in the states with lower average incomes. It is difficult to say which of these opposite tendencies is more important. If it is believed that the second tendency outweighs the first, the matching ratios should vary less than the income per capita figures. The inadequate measurement of need also leads to the conclusion that grants for specific purposes must be based on a gauge that includes a direct measurement of specific needs (e.g., housing, unemployment, costs of education). Here again we support a practical proposal of Dr. Wueller's by a somewhat different argument.

II E. L. DULLES

(The manner in which state incomes are measured is clearly dependent on the purposes for which measurements and rankings based on these measurements are used, as brought out in the discussion of Dr. Wueller's paper. I think there may be some misconceptions prevalent as to the nature of the purposes that now influence practical procedures in the United States.) The comments on model tax programs for states and on the measurement of state capacity made earlier by educational and other groups seem to me to indicate clearly the possibilities of misunderstanding tendencies today and tomorrow.

(In my opinion—and it must remain an opinion rather than a fact—there has been a marked departure from the earlier ideas. Those now working in the field tend, with certain exceptions, to stress not the importance of influencing the fiscal policy of the states in a constructive way or even of measuring capacity relative to need, a somewhat later development, but of looking at the matter to a considerable extent as a question of equalizing the flow of purchasing power and the demand for consumers' goods. Combined with this effort is the hope that this will increase national stability and expand national production. Implicit in some recent ideas relative to comparison of states is the notion that if we can 'prime the pumps' of demand and production in certain states, the nation as a whole will benefit and unemployment be reduced. Some may question the efficacy of a program based on such an idea, others may accept it; but I think one must watch carefully in the consideration of any set of rankings or any comparisons that may become available in the future to see whether there has been a shift toward this particular approach. I am inclined to think that the Byrnes' bill does represent this approach, and that the Wagner bill combines something of this idea with an attempt to emphasize need. Dr. Wueller's discussion of net federal drains is pertinent in this connection. It would carry no weight with those who wish to stress the purchasing power equalization whereas it has more significance to those who wish to talk about capacity relative to 'need'. The

choice between income produced or income paid out is also considerably influenced by the relative emphasis placed on these three approaches.

III H. M. GROVES

Dr. Wueller's paper deals with the economic capacity of the states and takes no account of the political institutions by which economic capacity is converted into public revenue and the means of supporting public functions. For example, the distribution of income has been mentioned in the foregoing discussion and the opinion expressed that it should not be left out of the picture in determining state capacity. (Is an even distribution of income a favorable or unfavorable factor in relative capacity? One may answer affirmatively on the ground that even distribution reduces extremes of wealth and poverty, neither of which is economically desirable, but he may also answer negatively on the ground that an even distribution allows little free surplus (above necessary expenditures) and that only such free surplus is a proper subject for taxation. Regardless of the correct answer to this question it illustrates the importance of the tax system in determining the ability to support public functions.) As a matter of fact income is the basis for only a very small proportion of state taxation and more taxes are based upon income produced in a given state than upon the income received by its residents. It might be possible for a state to have a relatively high economic capacity with relatively small potentialities for revenue under existing tax institutions. Some of the economic power might not be convertible into fiscal power.

Dr. Wueller has mentioned attempts to take account of tax institutions by estimating and comparing yields of a model tax system in the various states. This is objected to on the grounds that the choice of a model tax plan is subjective. The objection could be avoided were the actual tax plan employed instead of a model one. The actual tax plan would necessarily represent a sort of consensus of procedure in the states. For example, the percentage of state and local revenue derived from property, income, and sales taxes might be used to give these taxes proper

weight. The average rate of tax upon each of these bases might be applied to determine relative fiscal capacities. The great objection to this proposal is that the statistics on the distribution of wealth and sales by states are much less satisfactory than those for the distribution of income received. Nevertheless the use of per capita net income received as the sole criterion of fiscal capacity, when the tax system in many cases taxes everything except such net income, seems imperfect.

IV GORDON KEITH

Dr. Wueller proposes that an index of the fiscal capacities of the several states to support selected services be derived from the per capita income paid out to the residents after allowance has been made for federal drains. In selecting per capita income as the sole basis for his measurement of capacity, Dr. Wueller deliberately departs from the model tax plan approach to this problem by excluding the direct contributions of property and of business enterprise from his index, and by making no allowance for the effect of different distributions of income upon fiscal capacity. I question both the theoretical validity and the practical wisdom of these exclusions.

While it is fair to ask whether property that does not yield an income easily measurable in terms of money contributes anything to the fiscal capacity of a state, it is hard to deny that a state with much such capital within its taxing jurisdiction is better off than a state with little. The latter, if it is attempting to raise the general welfare of its people, has more claims upon its income than the former. Furthermore, property, whether it is income yielding or not, is an existing source of tax revenue that cannot be wholly discounted. If it is held to be desirable to give property less weight in measuring fiscal capacity, it would seem to be more reasonable to effect such a change under the model tax plan than to throw it out altogether, as Dr. Wueller suggests.

Similarly, the formal difficulty of estimating the extent of the contribution business enterprises make to the fiscal capacity of a state cannot justify the exclusion of such contributions when they are as certain as that business enterprises pay taxes. More-

over, to the extent that any one state has a relative advantage over other states in the production of any commodity, it can exploit that advantage through its tax system to increase its real income at the expense of non-resident owners, and, under certain conditions, of non-resident consumers. Nor does the argument that the contribution of business enterprise will be reflected in the income of state employees seem tenable. If business enterprise contributes to fiscal capacity, this contribution should be measured directly, not indirectly.

Finally, per capita income is an average which may conceal greater inequalities within states than it reveals between them. The fact that two states have equal per capita income does not necessarily mean that they have equal fiscal capacities, for it is well established that the more unequally income is distributed within a state, the greater is the capacity of that state to support public services. It seems, therefore, that any formula for the correct apportionment of variable grants-in-aid between the states should make allowance for such differences in income distribution.

Yet if we admit into an index of fiscal capacity these contributions of property and business enterprise, and if we allow for differences in income distribution, it is apparent that this index will be seriously affected by the extent to which the states are exploiting their sources of tax revenue. It is not reasonable to hold that a state has a low fiscal capacity merely because a faulty tax system does not enable it to collect all the revenue it could under the rules of the market. So, apparently we must return to the model tax plan approach if we are to include and weight correctly all the factors that contribute to the fiscal capacity of a state.

V J. L. MARTIN

These comments deal with the use of measures of income as indexes of fiscal capacities in the making of variable grants. Granted the validity of variable grants and of reference to income data in the making thereof, two concepts inherent in Dr. Wueller's approach could well receive further analysis and extension: the idea of model tax systems and of priority of claims

against income. Discussion of these two concepts cannot be entirely separated.

Dr. Wueller points out that the use of estimated revenues from model tax systems as measures of fiscal capacities has been subjected to significant criticism, in part on the grounds that the selection of models involves the investigators' preconceptions. It is important to recognize, however, that the use of unadjusted income data as indexes of fiscal capacities provides no absolute solution for this problem. Such an approach merely assumes a model tax system in which every dollar of income, within the limitations of the concepts employed in the measurement thereof, is equally taxable.¹

In considering the problems inherent in the use of income data in the construction of indexes of fiscal capacities, it might first be profitable to consider a few generalizations² on the nature of the relation between our public and private economies. (a) Tax structures are determined by public opinion, or politically effective sentiment. (b) Further, taxes take three general forms: levies against income, transactions, and wealth. (c) The functioning of our government units today is such that it is extremely doubtful that any differentiation can be made beyond the national government on the one hand and a combination of state-county-city-minor divisions on the other.³ (d) There are claims against tax revenues that have a priority status relative to other claims. (e) There are claims against income of such a nature that the amounts thereof are less subject to taxation than the rest of income.

The control of tax structures by public sentiment raises some presumption that the assumed model tax system should be based upon the existing system. It is not reasonable to presume that public sentiment will approve any assumed structure that is radically different from the existing structure. Assumption of a

¹ Dr. Wueller implies that some dollars are not equally taxable when he recommends deduction of federal tax collections from income before computation of indexes.

² Subject, of course, to the usual exceptions.

³ That is, there is a relatively distinct cleavage between the services performed by the federal government and by all other government units. The cleavage is much more ragged between the services rendered by each of these other government units.

radically different structure may well tend to defeat the purpose for which the assumption is made, since the inherent rigidity of the tax structure might prevent the raising of the revenue that is presumed in the indexes of fiscal capacities. This consideration is especially important because the idea of variable grants apparently tends to become effective in government policy when sufficient revenue is not raised for performance of a service at a given level. There is merit, of course, in the application of the same model in all units.

If this interpretation of the importance of existing tax structures is accepted, some attention must be given to the relation between taxation and income. Existing tax structures levy against income, transactions, and wealth. The Bureau of the Census shows in official figures for 1931-32 ⁴ that only a small proportion of state and local revenues were then derived from taxation of income as such and part of this probably represents taxes levied against corporate income.⁵ Because of the effect of exemptions and variable tax rates, even this small proportion will probably not be related directly to measures of income. Taxes levied against wealth are taxes levied against valuations of future income or consumption and need bear no fixed relation to current income. Taxes levied against transactions are related to current income perhaps even less directly.

The interlocking functioning of state, county, city, and minor division government units in the rendering of services may be readily demonstrated.⁶ This interlocking becomes important when the priority of claims against tax revenues is considered because, granted the priority, the adjustments to income figures in recognition thereof would need to be based on the total costs of the services as rendered by all the different units. An illustration of priority of claims to tax revenues lies in the reasonable

⁴ *Financial Statistics of State and Local Governments, 1932* These are the latest official and comprehensive figures.

⁵ Such income may or may not be included, at least directly, in the measurement of income used as a basis for computing an index of fiscal capacities. The percentage of revenue derived from income taxes has risen in the interim but probably remains definitely less than revenue from other sources.

⁶ In 1931-32 government cost payments by counties for health and sanitation were 29 per cent of all such government cost payments in Ohio and 17 per cent in Indiana. Cities contributed 38 per cent of all government cost payments for highways in Ohio and 25 per cent in Indiana. Similar illustrations are numerous.

certainly that such services as the protection of persons and property will be maintained at some level or degree before services such as the payment of pensions to the aged are initiated.

The establishment of priorities is difficult. There is a possible presumption, however, that the services first provided by government are the most important, although such a presumption is subject to limitations imposed by changing public sentiment. Perhaps more fruitful analysis could be made in terms of the services first curtailed when government units have adopted programs of economy. To the extent that rationalizing from the order of establishment or curtailment of services provides a basis for determining priority of claims against tax revenues, this problem may be solved with relative ease. Ideally, however, the analysis should be made in terms of levels of services and this treatment would be more difficult. Perhaps some workable solution is derivable by an assumption of priorities on the basis of some type of analysis suggested above with an arbitrary assignment of priority to the service to be initiated, equalized, or expanded in such position that expenditures for services of later priority would tend to offset possible economies in expenditures for services of earlier priority.⁷ Of course, the whole idea of priority of claims is necessarily based on the assumption that tax revenues are limited.⁸

Some forms of income are not subject to taxation as income, but they are relatively limited. All, or nearly all, income is subjected to taxation when translated into consumption or savings. More important is the fact that different forms of income, consumption, and savings are taxed at different rates. They are taxed at different rates both because of their inherent nature and because of their tendency to be identified with different classes of income recipients. The emphasis today on taxation levied on

⁷ For instance, assume the existence of services A, B, C, and D and the proposal to add service E. Analysis determines the priority ranking of A, B, C, and D in that order. We assign E to a position between C and D on the further assumption that possible economies in the cost of A, B, and C will make it possible to continue D at some level and render service E at a defined level. This is an illustration, not a formula.

⁸ If government had the means of performing all conceivable services there would be no problem as to which services to perform and at what level. This is obvious, but its recognition is important because it establishes priority as a function of revenue.

the basis of so-called ability to pay is clear in the field of income taxation proper. To the extent that wealth and income are similarly distributed the tendency is also clear for taxation levied against wealth. The relation of taxation levied against transactions to income is less clear. Perhaps no exact quantitative solution can be formulated to express the relation of taxation to income, but the importance of the consideration might well warrant the assumption of some arbitrary per capita deduction from income before computation of indexes of fiscal capacities.

These many problems might seem to demolish the case for the use of income data in the making of variable grants were it not that the existence of a better basis for making such grants has not been demonstrated. Pending the development of a better basis, it might be wisest to make adjustments to income data and to employ these adjusted figures in the construction of indexes of fiscal capacity. The need for adjustment arises from the two ideas these comments have sought to establish: not all income dollars are equally taxable; a priority of claim against tax revenues exists. In general, the solution to the first problem will be found in detailed analysis of income by type of payment,⁹ and to the second in detailed analysis of the structure of government.

The adjustment procedure might follow some such pattern as this: (a) From total payments or income of each type in all units to receive the grants, deduct all collections of taxes by the government unit making the variable grant, since the assumption of a superior priority for such collections is vital to the logic of variable grants.¹⁰ (b) From the net totals above subtract some amounts totaling to an approximation of the amount of income to which other claims exist of priority superior to other tax claims. This might be a standard amount varied between localities on the basis of relative costs of a standard of living. Because all, or nearly all, income is subject to taxation in its disposition if

⁹ Pending the development of or supplementary to analysis of size distributions of income

¹⁰ Note the difficulty of assigning deductions as charges against types of payment. This difficulty should not cloud the theory, however, and no better approach offers itself pending the development of size distributions of income. Similar treatment might also be given to borrowings of the unit making the variable grant to the extent that such borrowings increase total debt, but such an adjustment is not practicable because of the difficulty of identifying geographic sources of funds.

not in its receipt, these deductions can be merely approximations to the amount of income per capita not subject to taxation under the general pattern of taxation standardized from existing tax structures.¹¹ (c) Adjust the remainders for all units in such manner that each dollar of combined type of income or payment totals will be equally taxable. This process would be essentially one of applying different weights to different type of income payment remainders.¹² (d) Convert the figures for all units adjusted in step (c) to the level of the sum of the remainders (b) for all units. This amount is gross potential tax revenue by definition, since prior claims to income have been deducted in (a) and (b). (e) From the gross potentials above, subtract amounts determined to be superior claims on tax revenues. The resulting net revenue potentials will serve as a basis for computing indexes of fiscal capacity.

VI HANS NEISSER

Dr. Wueller's index is based on two premises, that 'ability' can be measured approximately as average income in the state, and that 'needs' are approximately proportionate to population. I shall not attempt to discuss here the validity of these standards; rather I shall attempt to present the logic of the regional income concept to be applied if these standards are accepted. The problem is to what extent must federal taxes be considered as reducing ability, and federal disbursements as increasing it? From a theoretical point of view, any state finds itself in a situation strictly analogous to the situation of the nation as a whole in relation to foreign countries. Now, we define the available income in the United States as given by the value of the net output plus or minus the balance of the current debt payments from or to foreign countries; voluntary contributions sent abroad are not treated as reducing available income.

¹¹ Persons at or below these levels will pay taxes, but the amount of such taxes should be approximately equivalent to the additional taxes persons above these levels would have paid had all their income been subject to taxation

¹² Note that payments of different types may be taxable directly or indirectly more than once and in more than one jurisdiction. Further, this adjustment or equalization must also take care of the equation to income of taxes levied against transactions and wealth as well as income, consumption, and savings

Correspondingly, the available income in a region or state is equal to the value of the net output plus or minus current debt payments from or to 'abroad', 'abroad' denotes here not only the other states but also the federal government.

The value of the *private* net output is equal to the sum of net incomes plus cost taxes minus subsidies. Cost taxes are all taxes payable by an entrepreneur and deductible from his taxable income. It does not matter by what authority these cost taxes are imposed, whether by the state or by the federal government, but it matters *where* they are imposed. Tariff duties, for example, affect only the *price of import goods*, which do not represent a part of the net output in the state. On the same grounds the income in state A is not affected by excise taxes or sales taxes imposed on capital goods produced in state B by either federal or state government, even if these goods are exported to and utilized in state A.

The 'public income' in any state is given by the net value of services performed in the state by the government, exclusive of mere 'transfer expenditure'. Services of the federal government are on the same footing as services performed by the state or municipal government. A difficulty is created by the centralized services of the federal government, i.e., its activities in Washington, D C., the costs of the army and navy, etc. One can either leave them out of consideration or distribute them among the states according to some standard.

Main interest centers around the correction of the value of the net output to allow for current debt payments. Interest, rent, and dividend payments from firms in one state to residents of another state represent the one item. The other item is represented by federal taxes. From the outset it is clear that no 'federal drain' from the state is created by cost taxes which, not being levied *in* the state (according to the principle stated above), do not affect the income in the state; and it follows too, that it does not matter much *which* federal cost taxes were included in computing the value of the private net output of the state: because the federal cost taxes included cancel out against the corresponding item in the federal drain. The items that really count are federal non-cost taxes, especially income and estate taxes.

Against the federal drain, constituted as just described, we

have to put, in the 'balance of payments' of the state concerned, the 'federal reflux', i.e., payments from the federal treasury to the state regardless from what sources or for what purpose. In other words, the available income in the state consists first of the services of certain federal officers residing in the state, and second, of the income these officers receive from Washington and enjoy as members of the community they are living in. To convince oneself that no double counting is involved one has only to consider the limiting case in which the total federal drain is returned as salary for, say, federal judges residing in the state: the *net* federal drain is zero and the services of the judges are a part of the income in the state.

^ If the regional income, determined in the way just indicated, is to be used as the basis for assigning federal grants, then it must not be overlooked that such grants would form a part of the federal reflux and, therefore, would increase the regional income. The most logical thing to do is to include the grant in question in the 'hypothetical' regional income and to compare it with the 'hypothetical' income in other regions. Otherwise, splitting up the grant in successive portions would affect the result.

VII MILTON FRIEDMAN

Dr. Dulles' comments on Dr. Wueller's paper serve to bring to the fore a confusion that seems to account for much of the failure of the author and the other commentators to see eye to eye. Dr. Wueller objects to model tax systems while Dr. Groves and Dr. Keith defend them; Mr. Martin and to some extent Dr. Groves suggest that a particular model tax system is implicit in Dr. Wueller's scheme and that this implicit system is undesirable since it assumes all taxes directly related to income; Dr. Wueller's reply seems to be that this is not a valid objection because the assumption is not far from the truth, but that it would not matter even if the assumption were far from the truth because the additional tax income appears in the accounts as income of government officials; Dr. Colm agrees with Dr. Wueller's conclusion but for only the second of the two reasons advanced.

These confusing and contradictory attitudes can, it seems to

me, be resolved if we follow up the hint that Dr. Dulles lets drop. (Dr. Groves, Dr. Keith, Mr. Martin, and, I believe, Dr. Colm interpret the per capita income figures primarily as intended to measure relative capacity to secure revenues for government functions, i.e., as intended to measure relative *fiscal capacity*. In their view, Dr. Wueller takes the concern of the government unit that is contemplating the making of grants—presumably the federal government—as primarily the maintenance of the functions of the governments to whom the grants are made—presumably the states—at a level fairly uniform from state to state. The level of activities other than those financed by public bodies is taken to be either of no concern or of only secondary concern to the government making the grants. If this interpretation were accepted, and strictly adhered to, the objections of the commentators would have to be granted almost complete validity. The relevant question from this point of view is the amount the states can raise as revenues; and if taxes based on or closely related to income do not provide the greater part of the revenues of the states, it will be a pure accident if per capita income is a good index of fiscal capacity in this sense. Moreover, it is no answer to this criticism that the tax receipts appear as the income of government officials and therefore are fully taken into account by measures of per capita income. This is the same sort of lifting-oneself-by-the-bootstraps argument as the contention that because individuals spend their incomes, a particular firm can pay any amount to its employees, since the more it pays the more it gets back. The point is that so far as part of the funds paid to government officials are returned to the state in the form of taxes, this merely means that the *net* cost of government services is less than the figures entered in the books; and the larger the total sum paid to employees the greater the reverse flow. But obviously this in no way accounts or allows for differences in the ease with which the funds to meet this *net* cost can be obtained from the rest of the community—the real point at issue.

Another interpretation of the purpose for which the per capita income figures are to be used is, however, possible. One may interpret them as measuring the capacity of the states to perform both government and private activities, i.e., as measuring relative *economic capacity*. Under this interpretation the purpose of

grants by the federal government would be to equalize the level of 'real' income among the states whether this income is provided by public or private activities. From this point of view, the use of per capita income can no longer be objected to on the grounds that many taxes are neither based on nor closely related to income. The character of the tax system will determine the relative share of public and private activities in a state's economy; it will only indirectly affect the absolute level of 'real' income, except as one state can through taxation divert to itself income that would otherwise have gone to a different state. Further, the inclusion of both the incomes of public officials and the taxes paid out of income in measuring the per capita income of the state is entirely valid and completely allows for the direct influence of differences in tax systems.

It is not entirely clear to which of these interpretations Dr. Wueller adheres. His seemingly studied avoidance of the modifier 'fiscal', his repeated reference to 'public and private economies' in discussing services, and the internal structure of his argument all point, though by no means unambiguously, to adherence to the second interpretation.

A clear differentiation between the two interpretations suggested serves to clear up several difficulties in addition to those already mentioned. Consider, for example, the question whether federal drains should be deducted in computing per capita income. If the per capita income figures are interpreted as measures of fiscal capacity, the first interpretation, and if there is a clear separation between the functions of the federal government and of the state and local governments, then the federal drains clearly should be deducted, for they represent part of the income of the state that cannot possibly be used to finance functions of the state or local governments. On the other hand, if the per capita income figures are interpreted as measures of economic capacity, the second interpretation, the treatment of federal drains depends, in theory at least, entirely on the use made of them. That portion of the funds that is used to provide services enjoyed by the residents of a state, or that is returned to the state in the form of grants, clearly should not be deducted; the remainder equally clearly should be deducted. (The remainder might of course be either positive or negative.)

Again, consider the problem stressed by Dr. Groves, the treatment of differences in inequality of income. Of two states with equal per capita incomes but different distributions of income, the state with the greater degree of inequality presumably has the greater *fiscal* capacity, but the smaller *economic* capacity.

A final point, quite unrelated to the preceding, perhaps deserves emphasis. If per capita income is conceived of as a measure of *economic* capacity, and if the purpose of grants is conceived of as the equalizing of 'real' income, then the problem of the geographic unit for which per capita figures are computed becomes of paramount importance. It may be hazarded that the observed differences among states in per capita income are more largely attributable to differences in degree of urbanization than to differences in the incomes of individuals residing in the same size of community) i.e., it may be hazarded that the per capita income of Alabama is lower than that of New York not primarily because a farmer in Alabama has a very much lower income than a farmer in New York or because a resident of a city of 100,000 in Alabama has a much lower income than a resident of a city of 100,000 in New York, but rather because, in both states, farmers have lower incomes than city dwellers and farmers constitute a larger proportion of the population of Alabama than of the population of New York. (If this guess is right, and there is some slight evidence in its favor, a real question arises concerning the extent to which transfers of income from states with high per capita income to states with low per capita income will serve to equalize 'real' income.)

In the first place, the problem of differences in cost of living becomes really acute; the general presumption is that the cost of living varies greatly among different sizes of community, although we have as yet not succeeded in measuring these differences at all satisfactorily. In the second place, and this is perhaps even more fundamental, even if cost of living were the same for all sizes of community, unless each state attempted to equalize incomes within the state, equalizing grants by the federal government might increase rather than decrease inequality. Suppose for example that farmers in Alabama and New York have identical average incomes, and so do residents of any given size of community, and that within both states the average income of

residents is higher the larger the size of community in which they reside. Because of the greater importance of large cities in New York per capita income in New York State would, under these conditions, be considerably higher than per capita income in Alabama. In making equalizing grants based on measures of per capita income, funds would be raised in New York State and transferred to Alabama. The net result, in the absence of attempts to equalize incomes within the states, would be that the poor farmer in Alabama would be subsidized, and the equally poor farmer in New York taxed! If the differences among sizes of community in average income reflected in the main differences in cost of living, the end product would be even more undesirable. In that case, equal standards of living in two states would necessarily be rendered unequal by equalizing grants. This tendency would be even stronger if, as Dr. Colm suggests, the cost of rendering the services supported by the grants varied in the same manner as cost of living in general.

I am not of course suggesting that the hypothetical situations I have outlined are correct and adequate representations of the existing situation. But the chance that they are not completely unreal seems sufficiently great to raise a serious question as to the wisdom of utilizing state per capita income figures as the basis for apportioning equalizing grants before the nature of state differences in per capita income and of size of community differences in cost of living are thoroughly investigated.

VIII P. H. WUELLER

I should like to take this opportunity to call attention to an apparent misunderstanding between myself and the commentators on my paper. As Mr. Friedman has pointed out, one "may interpret"¹ my suggestions as being concerned with the proxi-

¹ In the spirit of 'vindictiveness', I beg leave to point out that, in my opinion, Mr. Friedman's phrase "may interpret" accords the commentators a more lavish measure of the benefit of doubt than they are entitled to. In partial substantiation of this opinion, it may be pointed out that, seemingly, only two of the seven commentators (Gordon Keith and J. L. Martin) criticize my proposal on the assumption that the formulation and quantification of some concept of *fiscal capacity* is the issue under consideration. Dr. Groves, on the other hand, though observing

mate measurement of (a) the states' *fiscal* capacities or (b) the states' *economic* capacities. For the sake of clarification, I wish to state emphatically that my suggestions are concerned with the measurement of *economic* capacity for federal-state variable grant purposes.

With this stumbling block removed, the subsequent observations will be devoted to a brief consideration of some of the specific issues raised by the commentators. First, as regards the contention that some model tax system is implicit in the use of income as a capacity determinant, I can do no better than deny this contention and refer to the comments of Dr. Colm and Mr. Friedman for a justification of this denial.

Second, some commentators (Dr. Groves and Dr. Keith) have suggested that federal-state variable grants be made on the basis of the states' *fiscal* capacities.² Though Dr. Keith rests his case with a dictum to the effect that the model tax system approach *must* be used, Dr. Groves is more specific when he proposes to measure *fiscal* capacities by 'the actual tax plan', such 'actual tax plan' to represent a sort of consensus of procedure in the states.

Though, on the surface, Dr. Groves' plan seems to avoid the difficulties that seem inescapable whenever an investigator's preconceptions are admitted as *fiscal* capacity determinants, unfortunately, upon closer inspection, this does not seem to be the case. The choice of the average tax system³ is but one of an infinitely large number of possible choices. It is explicable only in

by way of introductory remark that "Wueller's paper deals with . . . economic capacity", seems to turn about and criticize the proposals on the assumption that I set myself the task of suggesting possible measures of *fiscal* capacity.

² In passing, it may be observed that none of the suggestions contains or refers to a definition of *fiscal* capacity. For an attempt at the formulation of alternative concepts of *fiscal* capacity see P. H. Wueller and Associates, *The Fiscal Capacity of the States: A Source Book*, section on 'Method and Measures'.

³ In the light of the marked differences among tax systems (see *ibid.*, Table III, Alabama-Wyoming) the possibility of constructing a statistically significant average system may be doubted. I gathered the impression at the meeting of the Conference that some of the proponents of the model tax system approach proceed upon the assumption that the hypothetical importance of a given tax system upon different state economies facilitates the computation of hypothetical state tax revenues whose actual abstraction would represent equal tax effort for all states. In the light of what is common knowledge with respect to the differences in the economies of the states, the validity of the equal tax effort assumption is not beyond dispute.

terms of the investigator's preconception as to the 'proper' relation of the private to the public economy. Again, use of the average tax system seems unsatisfactory, because to be truly representative it would make extensive use of capital values for tax base purposes.⁴

Third, Mr. Martin, though apparently accepting income as a basic capacity gauge, proposes to use the measure in a somewhat different manner from that suggested by me. Mr. Martin seems to object to the suggested use of income data on two grounds. In the first place, he seems to be of the opinion that the suggested approach implies subscription to the postulate that "all income dollars are equally taxable". Second, he feels that "a priority of claims against revenue exists" which the suggested approach allegedly disregards. Mr. Martin's first contention seems to lose its relevance if it is clearly realized that I aimed at suggesting a measure of *economic* rather than *fiscal* capacity. In considering Mr. Martin's second contention, it is well to remember that one of the purposes of variable ratio grants is to change the "existing priority of claims against tax revenue".⁵

∞ In conclusion, it may be permissible to call attention to some of the possible objectives of federal-state variable ratio matching grants. As Dr. Dulles has pointed out, different interests may wish to use the federal-state variable grant device for different purposes. To clarify my position, I should like to state that throughout my paper, I proceeded upon the assumption that it was the purpose of federal variable grants to facilitate some degree of equalization of service offerings.

Last, as regards the probable degree of equalization that could reasonably be expected if federal-state variable grants were incorporated into the contemporary institutional framework, I share Mr. Friedman's point of view. He suggests that at least in those

∞ Cf., *ibid.*

∞ To the extent that Mr. Martin's priority argument is a logical derivative of his claim with respect to the alleged rigidity of tax systems, it is of doubtful validity. The term 'rigid', which Mr. Martin applies to state tax systems, is not meaningful unless related to some point of reference. Some such necessary relation Mr. Martin fails to establish. However, tax systems, that is, the absolute and relative yield of specific tax bases, nominal and effective rates carried by specific bases, as well as the relative magnitude of total revenue fractions devoted to specific purposes, exhibit higher rates of change than some basic series such as income paid out, population, volume of product, and sales.

states which provide for the financing of a given function by means of state-local constant ratio matching grants, federal variable grants may well accentuate intra-state variations in service or cash offerings. In other words, inter-state equalization devices without intra-state variable grants cannot reasonably be expected to equalize service or cash offerings.

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