

# Estimation of Income Tax Revenue and Incidence

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IOWA STATE COLLEGE OF AGRICULTURE  
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AGRICULTURAL ECONOMICS SUBSECTION  
RURAL SOCIAL SCIENCE SECTION



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## SUMMARY

This bulletin presents and evaluates a particular method of estimating the yields and incidence of various possible types of income tax. The method is one of dividing the population into income brackets and estimating the number of people and average tax in each bracket. The basic data are the income distributions of families and single individuals in 1935-36 published in "Consumer Incomes in the United States" by the National Resources Committee and the Internal Revenue Bureau's "Statistics of Income" for various years.

It is necessary to combine data from these two sources since "Statistics of Income" presents information for higher income brackets only while the National Resources Committee's definition of income does not exactly correspond to the income on which a person is taxed. To make estimates using National Resources Committee data it is necessary to adjust the data for (1) the increase in population since the data were compiled, (2) the increase in national income, (3) the tendency of some persons to understate their incomes in filing tax returns, (4) the inclusion of home-grown food and occupancy of owned houses in NRC estimates, and (5) deductions and exemptions to which the taxpayers are entitled.

It was hoped to produce estimates applicable to 1941, 1942, and possibly 1943. It was assumed that the income distribution for a given year could be approximated by multiplying the number of persons in each income bracket by the ratio of population in the given year to the population in 1935-36, and the average income in each bracket by the ratio of national income in the given year to 62.5 billion dollars, the national income in the fiscal year, 1935-36. This is equivalent to assuming that a Lorenz curve fitted to the 1935-36 income distribution would also describe the income distribution of the given year. Separate sets of estimates were made for national incomes of 80 billion, 90 billion, 100 billion and 110 billion dollars since it was believed that national income will lie in that range in the next few years. The National Resources Committee's separate distributions for families and single individuals were maintained.

When the income distributions had been estimated for a particular level of national income, average incomes in each income bracket were reduced successively by allowances for

understatement, imputed incomes, and deductions. Amounts to allow for understatement and imputed incomes were obtained from National Resources Committee estimates. A fairly systematic relation between the percent of income allowed as deductions and the size of income was found in "Statistics of Income." A curve was fitted to this data and deductions were estimated from readings on the curve.

To estimate taxable income, one must also deduct exemptions and the earned income credit. The 1941 exemptions were \$750 for a single person and \$1,500 for a married couple plus \$400 for each additional dependent. An average number of dependents for families in each income bracket was obtained from the National Resources Committee estimates of average size of family in each income bracket. To facilitate making estimates for various exemption levels, and either with or without earned income credit, the exemptions and the earned income credit were aggregated before being tabulated in Family and Individual Tables 6-9. From these tables, tax revenue under various exemptions can be readily calculated. Revenue estimates for 7 levels of exemptions and each of the 4 levels of national income are given in table 10, p. 806. Corresponding estimates of tax base are shown graphically in fig. 2, p. 808. Useful information on the incidence of taxes with various exemptions and at various rates can readily be obtained from these calculations. Some are shown in table 11, p. 807.

To make the final estimates possible, several simplifications and approximations were used. The author sought some clue as to the magnitude of error that might have been caused by each. One of the most dangerous assumptions and one of the most difficult to evaluate was the assumption that the concentration of income did not change appreciably. In an effort to evaluate the effect of changes in income distribution, the author made similar estimates for a distribution considerably more concentrated than the estimated 1941 distribution and another set of estimates for a distribution considerably less concentrated than the estimated 1941 distribution. Substitution of the more concentrated distribution raises the revenue estimate under 1940 exemptions by about 14 percent, it raises the estimate under one-half 1940 exemptions by about 10 percent and has a negligible effect on the estimate under no exemptions. Substitution of the less concentrated distribution lowers the estimate under 1940 exemptions by about 12 percent, it lowers the estimate under one-half 1940 exemptions by about 6 percent, and has a negligible effect on the estimate under no exemptions. This shows that a substantial error in estimating income distribution leads to a substantial error in revenue

estimates except when the exemptions considered are very low. Since data on year to year changes in distribution are not available, no method could be free of error on this ground.

Assigning everyone in a particular income bracket average amounts of income, understatement, deductions, etc., causes serious error in brackets near the division between taxable and nontaxable brackets. This error would be present in all brackets if surtax rather than normal tax revenue were being estimated. In the present normal tax estimates, tax base appears to be understated by something in the neighborhood of 8 percent because of this type of error.

In making these estimates no adjustment was made to correspond to the National Resources Committee correction for nonreporting. It was believed that future tax administration and lowered exemptions would largely eliminate nonreporting and that the combined nonreporting and understatement corrections suggested in "Consumer Incomes" are probably too large. However, if they are correct and are going to continue to be about the same magnitude, the nonreporting correction should have been made. To have included the nonreporting correction would have reduced revenue estimates under 1940 exemptions by about 9 percent, under 1941 exemptions by about 10 percent, estimates under one-half 1940 exemptions would be reduced by about 13 percent and estimates under no exemptions by about 17 percent.

If the normal tax rate for which estimates are being made is above 23 percent, allowance must be made for the fact that some adjustment in surtax rates would necessarily be made to keep some individuals from being taxed at more than 100 percent on part of their income. It is quite possible that as the normal rose, surtax adjustments would be made before the 100 percent total rate (combined normal rate and surtax rate) was reached. The loss of surtax revenue for various normal rates has been estimated under the assumption that the present surtax rates are to be maintained until the combined rate reaches 90 percent and are given in table 14, p. 814. A similar set of estimates under the assumption that present surtax rates are to be maintained until the combined rate reaches 100 percent is given in table 16, p. 818. The method used in making these estimates is of some interest since it could be used to estimate revenue raised by various surtax schedules. It is outlined on pages 815 to 818.

The method was put to a further test by using it to estimate normal tax revenue in the years 1934 to 1939 and com-

paring the estimate to actual normal tax revenue. Comparisons for 1938 and 1939 were of little value since the alternative tax had been introduced. For 1934 through 1937, the comparison is summarized below. This summary is taken from the historical tests on pages 819 to 822.

ESTIMATED AND ACTUAL NORMAL TAX YIELDS.  
(Figures in Millions of Dollars)

Year	Estimated yield	Actual yield	Difference as a % of actual
1934	133	123	+8
1935	160	153	+5
1936	316	330	-4
1937	319	335	-5

Source for Actual Yield: Statistics of Income, United States Bureau of Internal Revenue, Washington.

# Estimation of Income Tax Revenue and Incidence\*

BY CLIFFORD G. HILDBETH

With government defense expenditures running into 11 figures, with prices showing a steady rise and with Congress having recently passed the largest revenue bill in history, it is to everyone's interest to know how much revenue various prospective taxes will produce, how the tax payments will be apportioned among the taxpayers and how these payments will affect prices, production and the effectiveness of our war effort.

The authors of *Paying for Defense* (The Blakiston Company, Philadelphia, 1941), discussed these questions for many different types of taxes and, in addition, set forth the principles on which the government should determine how much revenue to raise by taxation as opposed to borrowing. Two types of general sales tax and a broad personal income tax were subjected to the closest scrutiny since the investigation showed that they were the only available taxes which could raise the necessary amount of revenue. The investigation of sales and income taxes involved making estimates of the probable yield and incidence of these taxes with only a brief account of the methods used in making the estimates. This bulletin is intended to describe, critically examine and historically test the method used in making income tax calculations.

## I. DESCRIPTION OF THE METHOD

The estimates of tax yield and incidence are based on the tables of income distribution given in *Consumer Incomes in the United States* (National Resources Committee, Washington, 1938). Separate distributions for families and single individuals were used since they are allowed different exemptions from personal income tax and since they received somewhat different treatment in the *Consumer Incomes* and *Consumer Expendi-*

\* The writer is greatly indebted to Dr. Albert G. Hart who cooperated in working out the methods used. Dr. Hart also contributed careful criticism of various sections of the manuscript. Several valuable suggestions were received from Dr. Gerhard Tintner and Prof. Milton Friedman. Sincere appreciation is also extended the American Farm Bureau Federation, whose financial support was responsible for the initiation of the investigation in the spring of 1941.



FAMILY TABLE 1. NUMBER OF FAMILIES IN EACH INCOME CLASS AND AVERAGE INCOME AT VARIOUS LEVELS OF NATIONAL INCOME.

(Money Figures in Thousands of Dollars.)

Class No.	Income class	No. of families 1985-35	Av. income 1985-35	Estimated no. of families 1941	Estimated av. income 60 billion Dollars	Estimated av. income 80 billion Dollars	Estimated av. income 100 billion Dollars	Estimated av. income 110 billion Dollars	Estimated av. of persons per family
1.	Below 0.25.....	1,162,890	0.117	1,203,800	(1.2359)	(1.3901)	(1.5445)	(1.6690)	3.25
2.	0.250-0.500.....	3,015,394	0.887	3,121,400	0.145	0.163	0.181	0.199	3.63
3.	0.500-0.750.....	3,799,215	0.629	3,932,700	0.478	0.538	0.598	0.658	3.83
4.	0.750-1.00.....	4,277,048	0.874	4,427,400	0.778	0.873	0.970	1.067	3.86
5.	1.00-1.25.....	3,882,444	1.120	4,018,900	1.080	1.215	1.350	1.485	3.80
6.	1.25-1.50.....	2,805,472	1.394	2,966,200	1.884	1.557	1.730	1.908	3.97
7.	1.50-1.75.....	3,843,359	1.612	2,425,700	1.685	1.896	2.107	2.318	3.83
8.	1.75-2.00.....	1,897,037	1.829	1,963,700	1.992	2.241	2.490	2.739	3.65
9.	2.00-2.25.....	1,420,883	2.113	1,470,800	2.200	2.542	2.825	3.106	3.89
10.	2.25-2.50.....	1,043,977	2.368	1,050,700	2.611	2.937	3.264	3.592	3.86
11.	2.50-3.00.....	1,314,199	2.715	1,300,400	2.926	3.274	4.193	4.622	4.00
12.	3.00-3.50.....	743,559	3.209	709,700	3.355	4.461	4.956	5.452	3.99
13.	3.50-4.00.....	439,429	3.708	428,800	3.965	5.154	5.727	6.300	4.02
14.	4.00-4.50.....	249,948	4.194	258,700	4.582	5.890	6.478	7.126	4.18
15.	4.50-5.00.....	152,647	4.713	158,000	5.182	6.551	7.279	8.007	4.06
16.	5.00-7.50.....	322,950	5.884	334,300	5.824	6.551	9.088	9.997	3.80
17.	7.5-10.0.....	187,090	5.584	193,600	7.270	8.179	13.258	14.584	4.02
18.	10-15.....	131,821	11.853	130,500	10.607	11.632	15.781	19.288	4.02
19.	15-20.....	89,487	17.331	60,540	14.058	15.781	17.585	19.448	4.02
20.	20-25.....	34,309	22.282	35,410	21.415	24,001	26,798	29.445	4.02
21.	25-30.....	22,233	28.227	23,010	27.532	30,973	34,415	37,856	4.02
22.	30-40.....	15,561	36.012	16,110	34.878	39,237	43,597	47,957	4.02
23.	40-50.....	8,003	47.058	6,835	44.497	50.059	55.621	61.183	4.02
24.	50-100.....	10,571	71.422	10,940	58.887	66.245	73.600	80.970	4.02
25.	100-250.....	3,336	132.061	3,453	88.252	99.283	110.314	121.345	4.02
26.	250-500.....	699	286.372	724	163.178	183.573	203.971	224.368	4.02
27.	500-1,000.....	197	563.218	204	353.849	398.075	442.308	486.539	4.02
28.	1,000. and up.....	75	1,902.900	78	695.927	782.909	869.908	956.898	4.02
		29,400,900	3,162.356	30,433,004	2,350.161	2,043.902	2,937.681	3,231.449	4.02
					4,397.266	4,885.873	5,374.461		

tures<sup>4</sup> studies. Column 1 of Family Table 1 shows the brackets into which American families were divided in the National Resources Committee study. It is simply transcribed from table 3, page 18 of *Consumer Incomes in the United States*. Column 2 is also taken from this table. It shows the number of families in each income bracket on the basis of their incomes during the fiscal year, 1935-36. Column 3 shows the average incomes of families in each bracket.

The estimated number of families in each bracket in 1941 shown in column 4, was obtained by multiplying the number of families in each bracket in 1935-36 by the ratio of the population of the United States in 1941 to the population in 1935-36. The population in 1935-36 was taken to be an average of the midyear estimates of the Population of Continental United States for 1935 and 1936 published by the Bureau of Census. The estimate of population for 1941 was obtained by adding the average annual increase in the 3 years, 1938-40, to the Census Bureau's midyear estimate for 1940. The population of 1935-36 thus estimated was 127,975,000 as compared with 132,473,000 for the 1941 estimate. This makes the population ratio 1.035147. Estimates of the average incomes of families in each bracket under various assumptions as to the level of national income are presented in columns 5, 6 and 7 of Family Table 1. They were obtained by multiplying average income in each bracket in 1935-36 by the ratio of assumed per capita income in 1941 to per capita income in 1935-36. These ratios are shown at the top of columns 5 to 7. In computing them, per capita income in 1935-36 was obtained by dividing the 62,546 million-dollar total income payments, shown by the monthly series of the U. S. Department of Commerce, by 127,975,000, the 1935-36 population. The assumed per capita incomes for 1941 were obtained by dividing each assumed level of income by the estimated 1941 population.

This procedure is equivalent to assuming that the increase in population and the increase in income between 1935-36 and 1941 were distributed among the various income brackets in proportion to the numbers of people and amount of income each bracket contained in 1935-36. This would mean that the same Lorenz curve could be used to describe the pattern of income distribution in 1935-36 and in 1941. While no one would contend that this is the exact truth, the writer feels that it is the most reasonable assumption to make in the absence of detailed information for 1941 and that it is not seriously in error. Estimates of the average number of persons per family in each income bracket were calculated from the informa-

<sup>4</sup>*Consumer Expenditures in U. S.* (National Resources Committee, Washington, 1939).

INDIVIDUAL TABLE 1. NUMBER AND AVERAGE INCOMES OF INDIVIDUALS IN EACH INCOME CLASS AT VARIOUS LEVELS OF NATIONAL INCOME.

Class No.	Income class Dollars	No. of Individuals 1935-36	Average income 1935-36 Dollars	Estimated no. of Individuals 1941	Estimated av. income at \$80 billion level Dollars	Estimated av. income at \$90 billion level Dollars	Estimated av. income at \$100 billion level Dollars	Estimated av. income at \$110 billion level Dollars
1.	Under 250.....	960,844	165	994,400	204	229	255	280
2.	250-500.....	1,571,983	382	1,827,200	472	531	590	649
3.	500-750.....	1,972,745	624	2,042,100	771	867	964	1,060
4.	750-1,000.....	1,599,080	870	1,655,200	1,075	1,209	1,344	1,478
5.	1,000-1,250.....	1,108,551	1,119	1,147,500	1,383	1,555	1,728	1,901
6.	1,250-1,500.....	877,959	1,368	908,900	1,690	1,902	2,113	2,324
7.	1,500-1,750.....	546,646	1,616	565,900	1,997	2,246	2,496	2,746
8.	1,750-2,000.....	398,985	1,868	413,000	2,308	2,597	2,886	3,174
9.	2,000-2,250.....	283,652	2,118	298,900	2,617	2,944	3,271	3,598
10.	2,250-2,500.....	210,099	2,367	217,500	2,925	3,290	3,656	4,022
11.	2,500-3,000.....	161,275	2,794	166,900	3,341	3,759	4,176	4,594
12.	3,000-3,500.....	108,360	3,225	112,200	3,985	4,483	4,981	5,479
13.	3,500-4,000.....	63,731	3,727	65,970	4,605	5,181	5,758	6,332
14.	4,000-4,500.....	36,105	4,278	37,370	5,288	5,947	6,607	7,266
15.	4,500-5,000.....	25,491	4,799	26,390	5,930	6,671	7,412	8,153
16.	5,000-7,500.....	57,316	6,007	59,330	7,422	8,350	9,278	10,206
17.	7,500-10,000.....	28,582	8,473	29,590	10,469	11,778	13,087	14,396
18.	10,000-15,000.....	20,961	12,000	21,590	14,828	16,681	18,534	20,387
19.	15,000-20,000.....	9,436	17,058	9,768	21,071	23,705	26,339	28,973
20.	20,000-25,000.....	5,617	22,588	5,814	27,910	31,399	34,888	38,377
21.	25,000-30,000.....	3,350	27,672	3,468	34,192	38,466	42,740	47,014
22.	30,000-40,000.....	2,398	33,729	2,482	41,676	46,885	52,095	57,304
23.	40,000-50,000.....	1,737	43,536	1,798	53,794	60,518	67,242	73,966
24.	50,000-100,000.....	2,470	62,133	2,557	76,773	86,369	96,966	106,563
25.	100,000-250,000.....	898	121,847	836	150,557	169,375	188,193	207,014
26.	250,000-500,000.....	217	296,424	225	366,269	412,048	457,833	503,616
27.	500,000-1,000,000.....	43	554,628	45	685,313	770,968	856,635	942,299
28.	1,000,000 & over.....	12	1,215,583	12	1,502,006	1,689,738	1,877,495	2,065,244
		10,053,000	2,452,903	10,411,445	3,030,869	3,409,691	3,788,561	4,167,418

tion given in table 4, page 21, and table 8B, page 97, of *Consumer Incomes in the United States*. In an exactly parallel manner, Individual Table 1 was built up from the basic distribution of single individuals given in table 15, page 30, of *Consumer Incomes*.

When the average incomes are inflated as described above, the limits of each class are also inflated. Income class 1 includes families and individuals whose incomes are below \$250 when national income is at the 1935-36 level, at the 80 billion dollar-level class 1 includes those with incomes below \$309, at the 90 billion dollar-level the limit is \$348 and with a 100 billion dollar-national income the upper limit of class 1 becomes \$386. Similarly, the limits of class 2 vary from \$250 and \$500 with national income at the 1935-36 level to \$425 and \$849 with national income at the 110 billion dollar-level. It is possible, of course, to reallocate the families and individuals among classes with the original limits each time national income is assumed to vary, but such a reallocation would involve extensive calculations and would add little to the accuracy of subsequent computations. People with incomes between \$27,800 and \$34,750, for example, are about as homogeneous a group as people with incomes between \$20,000 and \$25,000.

Incomes thus derived from National Resources Committee data differ from taxable incomes for the following reasons:

1. The Committee's definition<sup>a</sup> of income in their study excludes capital gains and losses.
2. Some persons successfully understate their incomes in their tax reports or fail to file reports.
3. The Committee's estimates include certain non-cash items of income and some nontaxable cash income.
4. Taxpayers are allowed to claim certain deductions, exemptions and an earned income credit.

Since capital gains and losses fluctuate sharply from year to year, they were left out of the basic calculations. Capital gains are virtually certain to exceed capital losses in income tax statistics because deductible capital losses for any person were limited to \$2,000 more than his reported capital gains prior to 1938, and at present short-term capital losses are limited to the amount of reported short-term capital gains. Omission of capital gains and losses gives the estimates of tax revenue a small and variable downward bias. Some idea of the size of this bias may be obtained by examining the historical series, pp. 819-822.

<sup>a</sup>This definition is explained on page 41, *Consumer Incomes in the United States*.

FAMILY TABLE 3. PER-FAMILY TAX BASE ON AN 60 BILLION-DOLLAR INCOME.

Class No.	Av. income Dollars	Av. under-statement Dollars	Av. imputed food Dollars	Av. imputed housing Dollars	Av. "reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1.....	145	24	72	13	26	1	36	4
2.....	478	80	72	43	238	20	263	26
3.....	776	129	72	50	625	43	482	48
4.....	1,080	180	72	57	771	66	705	70
5.....	1,884	231	72	75	1,006	98	908	91
6.....	1,685	281	72	89	1,248	118	1,125	112
7.....	1,992	332	72	102	1,480	146	1,334	134
8.....	2,260	377	72	106	1,705	171	1,534	163
9.....	2,811	435	72	125	1,979	202	1,777	176
10.....	2,926	487	72	140	2,227	239	1,986	200
11.....	3,355	559	72	161	2,563	272	2,291	229
12.....	3,965	660	72	186	3,047	332	2,715	272
13.....	4,582	763	72	215	3,532	392	3,140	307
14.....	5,183	868	72	228	4,019	454	3,565	328
15.....	5,824	971	72	256	4,525	520	4,005	356
16.....	7,270	948	72	284	5,966	710	5,256	412
17.....	10,607	1,383	72	414	8,738	1,092	7,646	532
18.....	14,098	1,829	72	505	11,622	1,499	10,123	656
19.....	21,415	2,798	72	723	17,822	2,424	15,398	920
20.....	27,532	2,502	72	826	24,133	3,403	20,729	1,186
21.....	34,878	1,660	72	1,046	32,100	4,654	27,446	1,400
22.....	44,497	2,118	72	1,335	40,972	6,105	34,867	1,600
23.....	58,867	2,804	72	1,767	54,244	8,299	45,945	1,600
24.....	86,252	0	72	2,648	85,582	13,695	71,887	1,600
25.....	163,178	0	72	4,895	158,211	26,896	131,315	1,600
26.....	353,849	0	72	10,615	343,162	62,112	281,050	1,600
27.....	696,927	0	72	20,878	674,977	129,596	545,381	1,600
28.....	2,350,161	0	72	70,505	2,279,584	480,992	1,798,592	1,600
	3,906,726	22,409	2,016	118,292	3,760,009	744,531	3,021,479	17,400

\* In the sense in which the term is used by the Bureau of Internal Revenue.

## UNDERSTATEMENT

The *Consumer Incomes* study used income tax statistics to adjust sample data for higher income levels. The successive adjustments made are described on pages 80-87 of *Consumer Incomes in the United States*. Theoretically, since that study obtained a distribution of actual incomes by successive adjustment of income tax data, one could estimate income tax liability by reversing those adjustments. For the most part, this is what has been done in the present study. To allow for understatement, average incomes of families and individuals in classes 16 through 19 were reduced by 13.04 percent; average incomes in class 20, by 9.09 percent; and those of classes 21 through 23, by 4.76 percent. This exactly reverses the *Consumer Incomes* adjustment for understatement. However, this concerned only income classes above \$5,000 and since they stated, as seems reasonable, that understatement is proportionately greater at the lower income levels, a correction of 16.67

INDIVIDUAL TABLE 2. TAX BASE PER INDIVIDUAL ON AN 80 BILLION DOLLAR INCOME.

Class No.	Av. Income Dollars	Understatement Dollars	Av. "reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1.....	204	34	170	11	159	16
2.....	472	78	394	30	364	36
3.....	771	128	643	55	588	60
4.....	1,075	179	896	61	835	81
5.....	1,383	230	1,153	106	1,045	104
6.....	1,690	281	1,409	137	1,272	127
7.....	1,997	332	1,665	167	1,498	150
8.....	2,306	384	1,924	196	1,728	173
9.....	2,617	436	2,181	227	1,954	196
10.....	2,925	487	2,438	256	2,182	218
11.....	3,241	556	2,785	298	2,487	249
12.....	3,565	664	3,321	365	2,956	296
13.....	4,005	767	3,838	430	3,408	330
14.....	5,286	881	4,405	502	3,903	345
15.....	5,930	988	4,942	573	4,369	368
16.....	7,423	968	6,454	774	5,680	434
17.....	10,409	1,365	9,104	1,147	7,957	548
18.....	14,828	1,984	12,894	1,639	11,255	719
19.....	21,071	2,748	18,323	2,492	15,831	941
20.....	27,910	2,537	25,373	2,576	21,796	1,240
21.....	34,198	1,629	32,569	4,723	27,846	1,400
22.....	41,676	1,984	39,692	5,674	34,018	1,400
23.....	53,794	2,561	51,233	7,787	43,446	1,400
24.....	76,773	0	76,773	12,139	64,634	1,400
25.....	150,557	0	150,557	25,444	125,113	1,400
26.....	306,309	0	306,309	66,061	240,248	1,400
27.....	608,513	0	608,513	131,549	476,964	1,400
28.....	1,502,006	0	1,502,006	306,409	1,195,597	1,400
	3,030,969	22,150	3,008,719	573,723	2,434,996	17,619

\*In the sense in which the term is used by the Bureau of Internal Revenue.

FAMILY TABLE 3. PER-FAMILY TAX BASE ON A 90 BILLION-DOLLAR INCOME.

Class No.	Av. income Dollars	Av. under-statement Dollars	Av. imputed food Dollars	Av. imputed housing Dollars	Av. "reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1	163	27	72	15	49	8	45	5
2	539	89	72	48	329	25	304	50
3	873	145	72	56	600	52	548	55
4	1,215	202	72	64	877	81	796	50
5	1,557	259	72	84	1,142	110	1,032	108
6	1,890	316	72	100	1,406	139	1,269	127
7	2,241	373	72	114	1,682	170	1,512	151
8	2,542	423	72	119	1,923	199	1,729	173
9	2,937	489	72	141	2,235	235	2,000	200
10	3,292	548	72	153	2,514	269	2,245	225
11	3,774	629	72	181	2,892	315	2,577	256
12	4,461	743	72	210	3,436	384	3,052	303
13	5,154	869	72	242	3,981	464	3,517	326
14	5,830	971	72	257	4,530	525	4,005	350
15	6,551	1,091	72	288	5,100	602	4,498	375
16	8,179	1,006	72	319	6,722	690	5,992	445
17	11,932	1,556	72	466	9,839	1,259	8,580	579
18	15,781	2,054	72	568	13,063	1,727	11,336	718
19	24,091	3,142	72	819	20,068	2,768	17,290	1,015
20	30,973	3,315	72	929	27,157	3,383	23,774	1,314
21	39,237	1,868	72	1,177	36,120	5,310	30,810	1,400
22	50,059	2,383	72	1,502	46,102	6,961	39,141	1,400
23	66,248	3,154	72	1,987	61,035	9,460	51,575	1,400
24	90,283	0	72	2,978	96,233	15,590	80,643	1,400
25	133,573	0	72	5,507	177,394	30,615	147,379	1,400
26	398,075	0	72	11,942	386,061	71,035	315,026	1,400
27	782,909	0	72	23,487	759,350	147,314	612,036	1,400
28	2,643,902	0	72	79,317	2,564,513	546,241	2,018,272	1,400
	4,397,266	25,206	2,016	133,074	4,236,970	846,546	3,390,424	13,032

\* In the sense in which the term is used by the Bureau of Internal Revenue.

percent was made in classes 1 to 15. *Consumer Incomes* made an additional allowance for nonreporting (i. e., failure to file a return); but since the present study was designed to estimate revenue principally for a broadened tax base under which nonreporting should be substantially eliminated,<sup>3</sup> this nonreporting adjustment was not made. Omitting this adjustment makes but a small difference in the final estimates as is shown in Section II, pages 813 and 814. The understatement correction for each income bracket is shown in column 2 of Family and Individual Tables 2, 3, 4 and 5.

INDIVIDUAL TABLE 3. TAX BASE PER INDIVIDUAL ON A 90 BILLION-DOLLAR INCOME.

Class No.	Av. income Dollars	Understatement Dollars	Av. "re-reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1	229	88	191	13	178	18
2	631	88	643	85	468	41
3	897	144	723	63	690	66
4	1,309	202	1,007	98	914	91
5	1,655	259	1,296	124	1,172	117
6	1,902	317	1,585	157	1,428	143
7	2,246	374	1,872	189	1,683	168
8	2,597	433	2,164	225	1,939	194
9	3,944	691	2,456	256	2,195	229
10	3,290	548	2,743	293	2,449	245
11	3,759	696	3,133	341	2,792	279
12	4,438	747	3,736	413	3,313	316
13	5,181	657	4,317	479	3,825	341
14	5,947	991	4,956	575	4,381	399
15	6,671	1,112	5,559	656	4,903	395
16	6,359	1,089	7,361	898	6,375	499
17	11,778	1,536	10,342	1,301	8,941	597
18	16,631	2,176	14,505	1,929	12,576	779
19	23,705	3,092	20,412	2,845	17,768	1,038
20	31,299	2,855	29,544	4,082	24,462	1,373
21	39,496	1,823	36,634	5,385	31,249	1,400
22	46,885	2,333	44,658	6,346	37,954	1,400
23	60,518	2,882	57,639	8,574	49,799	1,400
24	86,369	0	86,369	13,819	72,550	1,400
25	169,376	0	169,376	26,933	140,412	1,400
26	412,948	0	412,948	75,317	336,231	1,400
27	779,963	0	779,963	149,568	621,409	1,400
28	1,689,738	0	1,689,738	339,637	1,350,101	1,400
	3,409,691	24,922	3,264,763	642,738	2,741,024	15,459

\* In the sense in which the term is used by the Bureau of Internal Revenue.

<sup>3</sup>As more of the population are required to file returns nonreporting should become more difficult. Use of an administrative system similar to the Social Security organization as advocated in *Paying for Defense* should also help to eliminate this inexcusable loophole.



FAMILY TABLE 4. PER-FAMILY TAX BASE ON AN 100 BILLION-DOLLAR INCOME.

Class No.	Av. Income Dollars	Av. under-statement Dollars	Av. Imputed food Dollars	Av. Imputed housing Dollars	Av. "reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1.....	181	80	72	16	63	3	60	6
2.....	568	100	72	54	372	28	344	24
3.....	970	161	72	62	675	58	617	62
4.....	1,350	225	72	72	981	80	892	80
5.....	1,730	288	72	98	1,277	121	1,156	116
6.....	2,107	351	72	112	1,572	156	1,416	142
7.....	2,490	415	72	127	1,876	189	1,687	169
8.....	2,825	470	72	133	2,150	221	1,929	196
9.....	3,264	544	72	157	2,491	264	2,227	223
10.....	3,657	609	72	176	2,800	300	2,500	250
11.....	4,168	698	72	201	3,222	354	2,868	287
12.....	4,956	826	72	233	3,825	428	3,397	320
13.....	5,727	954	72	269	4,432	505	3,927	346
14.....	6,478	1,079	72	285	5,042	590	4,452	373
15.....	7,279	1,213	72	320	5,674	670	5,004	400
16.....	8,068	1,185	72	354	7,477	920	6,557	478
17.....	13,258	1,729	72	517	10,940	1,400	9,540	627
18.....	17,535	2,287	72	631	14,545	1,934	12,611	781
19.....	26,768	3,491	72	910	22,295	3,099	19,196	1,110
20.....	84,415	3,128	72	1,032	30,183	4,346	25,837	1,400
21.....	43,597	2,076	72	1,308	40,141	5,941	34,200	1,400
22.....	56,621	2,649	72	1,660	51,232	7,787	43,445	1,400
23.....	73,609	3,505	72	2,208	67,824	10,648	57,176	1,400
24.....	110,314	0	72	3,309	106,933	17,537	89,396	1,400
25.....	208,971	0	72	6,119	197,780	34,216	163,564	1,400
26.....	442,308	0	72	13,269	428,967	79,359	349,608	1,400
27.....	869,908	0	72	26,007	843,734	164,528	679,206	1,400
28.....	2,637,681	0	72	88,130	2,849,479	609,798	2,239,680	1,400
	4,885,873	23,012	2,016	147,868	4,707,983	945,480	3,762,502	18,606

\* In the sense in which the term is used by the Bureau of Internal Revenue

## IMPUTED INCOMES

The National Resources Committee estimates of the average value of imputed food and imputed housing for American families (they considered such items negligible for single individuals) are given in table 6A, page 78, and table 8A, page 79, of *Consumer Expenditures in the United States*. These include the value of home-produced food and the rental value of owned homes. Since these averages are estimated for 1935-36, some presumption must be made as to what happens to imputed food and housing as average incomes rise. It was taken as reasonable that home-produced food should remain at a constant absolute level, while rental value of owned homes should remain a constant proportion of income as incomes rose. The figures for imputed value of home-produced food do not seem to vary significantly with income level so a flat \$72 was deducted from

INDIVIDUAL TABLE 4. TAX BASE PER INDIVIDUAL ON AN 100 BILLION-DOLLAR INCOME.

Class No.	Av. Income Dollars	Under-statement Dollars	Av. "re-reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1.....	255	42	213	14	199	20
2.....	500	96	492	40	452	46
3.....	964	161	808	71	733	72
4.....	1,344	224	1,120	104	1,016	102
5.....	1,728	288	1,440	140	1,300	130
6.....	2,112	352	1,761	176	1,585	150
7.....	2,496	416	2,080	214	1,866	167
8.....	2,880	481	2,404	252	2,152	215
9.....	3,271	545	2,726	292	2,434	243
10.....	3,656	609	3,047	332	2,715	272
11.....	4,176	696	3,480	396	3,084	305
12.....	4,961	830	4,131	472	3,678	334
13.....	5,756	969	4,787	556	4,241	392
14.....	6,607	1,101	5,506	650	4,856	456
15.....	7,412	1,235	6,177	741	5,436	522
16.....	8,278	1,370	6,908	1,000	7,008	608
17.....	13,087	1,707	11,380	1,468	9,912	646
18.....	18,534	2,417	16,117	2,100	13,967	846
19.....	26,339	3,436	22,903	3,203	19,697	1,135
20.....	34,868	4,172	31,716	4,559	27,117	1,400
21.....	42,740	5,035	40,705	5,005	34,640	1,400
22.....	52,006	5,461	49,514	7,541	42,073	1,400
23.....	67,242	5,802	64,040	9,990	54,050	1,400
24.....	95,906	0	95,906	15,546	80,400	1,400
25.....	128,196	0	128,196	23,370	104,825	1,400
26.....	167,833	0	167,833	35,157	132,676	1,400
27.....	216,635	0	216,635	51,900	164,735	1,400
28.....	2,677,496	0	2,677,496	640,519	2,036,976	1,400
	2,786,561	27,607	2,780,864	731,363	2,028,902	18,304

\* In the sense in which the term is used by the Bureau of Internal Revenue.

FAMILY TABLE 5. PER-FAMILY TAX BASE ON AN 110 BILLION-DOLLAR INCOME.

Class No.	Av. income Dollars	Av. under-statement Dollars	Av. imputed food Dollars	Av. imputed housing Dollars	Av. "reported income" Dollars	Deductions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1.....	199	83	72	18	79	5	71	7
2.....	658	110	72	42	434	86	398	40
3.....	1,067	178	72	59	759	65	694	70
4.....	1,485	248	72	79	1,068	100	968	99
5.....	1,908	317	72	89	1,425	140	1,285	123
6.....	2,318	386	72	111	1,749	171	1,578	158
7.....	2,789	457	72	131	2,079	212	1,867	187
8.....	3,108	518	72	146	2,372	251	2,121	212
9.....	3,500	598	72	169	2,751	292	2,459	246
10.....	4,022	671	72	177	3,103	338	2,765	276
11.....	4,612	769	72	206	3,568	402	3,166	309
12.....	5,452	909	72	213	4,258	481	3,777	339
13.....	6,300	1,050	72	246	4,932	572	4,360	388
14.....	7,128	1,188	72	278	5,588	648	4,940	397
15.....	8,007	1,335	72	312	6,288	755	5,533	437
16.....	9,997	1,504	72	350	8,231	1,021	7,210	510
17.....	14,584	1,902	72	525	12,085	1,589	10,502	675
18.....	19,288	2,515	72	656	16,045	2,169	13,879	844
19.....	29,445	3,840	72	883	24,650	3,500	21,150	1,208
20.....	37,859	5,441	72	1,196	33,207	4,815	28,392	1,400
21.....	47,067	7,239	72	1,499	44,153	6,586	37,627	1,400
22.....	61,183	9,912	72	1,855	56,364	8,798	47,571	1,400
23.....	80,970	13,354	72	2,429	74,615	11,664	62,751	1,400
24.....	121,345	0	72	3,640	117,633	19,527	98,103	1,400
25.....	224,868	0	72	6,731	217,595	37,856	179,709	1,400
26.....	498,539	0	72	14,556	471,671	85,712	385,159	1,400
27.....	666,868	0	72	23,707	629,114	133,787	495,327	1,400
28.....	8,231,449	0	72	96,943	8,134,494	683,307	7,451,187	1,400
	5,374,461	90,818	2,016	162,182	5,179,445	1,057,916	4,121,529	19,069

\* In the sense in which the term is used by the Bureau of Internal Revenue.

the average incomes of families in each bracket. The allowance for imputed housing was 9.0 percent in income classes 1 and 2, 6.4 percent in class 3, 5.3 percent in class 4, etc., as listed in table 6A of *Consumer Expenditures*. The actual amounts subtracted are given in column 4 of Family Table 2, 3, 4 and 5.

No amount was subtracted to allow for the portion of income composed of tax-exempt interest. The recent tendency has been to eliminate such exemptions, and such elimination is advocated by the authors of *Paying for Defense*. Past effects of such exemptions on tax revenue are shown in the historical test of the method on pages 819 to 822.

INDIVIDUAL TABLE 5. TAX BASE PER INDIVIDUAL ON AN 110 BILLION-DOLLAR INCOME.

Class No.	Av. Income Dollars	Under-state-ment Dollars	Av. "re-ported income" Dollars	Deduct-ions Dollars	Av. net income* Dollars	Av. earned income credit Dollars
1	280	47	233	19	214	21
2	649	108	541	46	495	50
3	1,030	177	853	76	807	81
4	1,478	246	1,232	116	1,116	112
5	1,901	317	1,584	155	1,429	142
6	2,334	387	1,947	198	1,739	174
7	2,746	458	2,288	243	2,045	204
8	3,174	529	2,645	280	2,365	236
9	3,596	600	2,996	327	2,671	267
10	4,023	670	3,353	366	2,987	299
11	4,494	746	3,748	433	3,315	320
12	5,479	913	4,566	530	4,036	362
13	6,332	1,066	5,276	612	4,664	383
14	7,298	1,212	6,086	727	5,359	416
15	8,152	1,359	6,793	815	5,978	449
16	10,206	1,581	8,625	1,100	7,525	539
17	14,396	1,877	12,519	1,640	10,879	694
18	20,587	2,658	17,929	2,392	15,537	917
19	26,973	3,778	23,195	3,578	21,617	1,231
20	33,377	4,488	28,889	5,059	23,830	1,400
21	47,014	5,288	41,726	6,806	34,920	1,400
22	57,304	5,738	51,566	8,296	43,270	1,400
23	73,966	5,821	68,145	10,989	57,156	1,400
24	105,563	0	105,563	17,101	88,462	1,400
25	207,014	0	207,014	35,039	171,974	1,400
26	408,616	0	408,616	64,080	344,536	1,400
27	842,296	0	842,296	128,575	713,721	1,400
28	2,065,244	0	2,065,244	451,636	1,613,608	1,400
	4,167,416	30,664	4,136,752	830,815	3,305,937	19,486

\*In the sense in which the term is used by the Bureau of Internal Revenue.

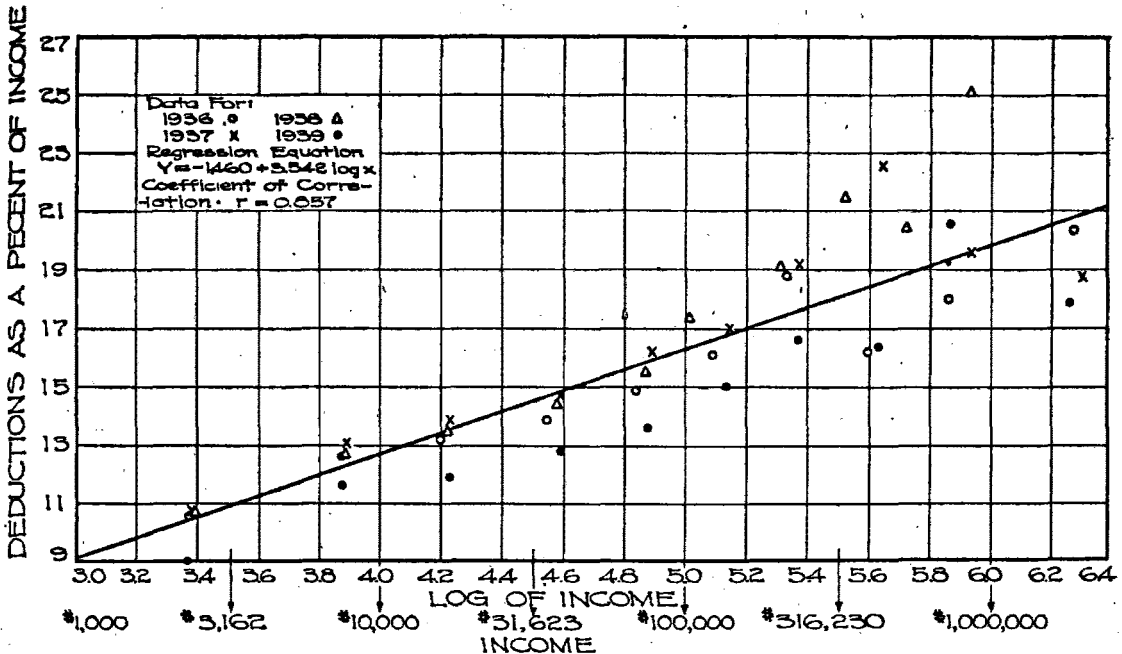


Fig. 1. Relation between deductions and income.

## DEDUCTIONS

Subtraction of these items gives "Reported Income" which is shown in column 5 of Family Tables 2 to 5, and column 3 of Individual Tables 2 to 5. "Reported Income" differs from taxable income by deductions, exemptions, earned income credit and capital gains and losses. In the present study, systematic allowances have been made for deductions, exemptions and earned income credit. Capital gains and losses were omitted from the basic estimates as explained on page 787.

The correct allowances to make for deductions were approximated from *Statistics of Income* (United States Internal Revenue Office, Washington) for various years. From tables showing income and deductions by sources for each of ten income brackets for the years 1936, 1937, 1938 and 1939, deductions net of capital loss and total income net of capital gain were computed for each bracket for each year. Total income as used in *Statistics of Income*, less capital gains is roughly the equivalent of "Reported Income" which appears in Family and Individual Tables 2 to 5. Deductions net of capital loss for each bracket were expressed as a percent of income net of capital gains and plotted against average income net of capital gain. It was found that when the income was plotted on a logarithmic scale, the plotted points approximated a straight line. The points and the straight line which was fitted to them are shown in fig. 1. This line, then, gives deductions as a percent of reported income. The deductions shown in column 6 of Family Tables 2 to 5 and column 4 of Individual Tables 2 to 5 were calculated by substituting the logarithm of each reported income for  $\log X$  in the regression equation and taking the resulting percentage ( $y$ ) times the reported income.

## EARNED INCOME CREDIT

"Reported Income" less deductions gives "net income" in the sense in which the term is used in *Statistics of Income*. Average net income for each bracket for each income level is shown in column 7 of Family Tables 2 to 5, and column 5 of Individual Tables 2 to 5. This is the amount on which each person's tax would be based if no exemptions and no earned income credit were allowed. The present law allows each person to deduct 10 percent of his earned income (income for wages,

\*The tables used are found on pages 11-13, *Statistics of Income for 1936*, part 1; pages 13-15, *Statistics of Income for 1937*, part 1; pages 9-11, *Statistics of Income for 1938*, preliminary report of individual income tax returns and taxable fiduciary income tax returns filed in the period January through June, 1939; and page 6 of a press release from the Treasury Department dated April 4, 1941, concerning returns on 1939 incomes.

FAMILY TABLE 6. AGGREGATE TAX BASE FOR FAMILIES WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 80 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	1941 exemptions		Earned income credit	Tax base with 1941 exemptions and earned income credit
		Head of family	Credit for dependents		
1.....	43	1,806	602	5	(2,370)
2.....	821	4,682	2,035	81	(5,977)
3.....	1,696	5,899	2,879	189	(7,071)
4.....	3,112	6,641	3,294	310	(7,133)
5.....	3,699	6,028	2,894	366	(5,619)
6.....	3,337	4,449	2,219	332	(3,663)
7.....	3,250	3,838	1,805	325	(2,518)
8.....	3,012	2,945	1,453	300	(1,066)
9.....	2,614	2,208	1,112	262	( 966)
10.....	2,156	1,621	804	216	( 485)
11.....	3,117	2,041	1,068	312	( 324)
12.....	2,090	1,164	613	209	114
13.....	1,425	681	367	139	238
14.....	922	388	226	86	223
15.....	633	237	130	55	211
16.....	1,757	508	275	138	842
17.....	1,480	290	139	103	948
18.....	1,382	205	110	90	977
19.....	982	91	49	56	736
20.....	734	63	29	42	610
21.....	639	34	19	32	547
22.....	562	24	13	22	502
23.....	314	10	6	10	288
24.....	786	16	9	15	746
25.....	452	5	3	5	440
26.....	208	1	1	1	200
27.....	111	1	0	0	110
28.....	140	} 1*		0	140
	41,583	45,648	22,174	3,701	(29,940)
					7,872

\* Classes grouped are below \$500,000.

salaries, professional fees or other personal compensation) from his net income before it is taxed, with the provision that the first \$3,000 of any income is considered to be earned and no one may claim an earned income credit on more than \$14,000. This means that everyone whose net income is below \$3,000 gets a credit of 10 percent of net income; those with net incomes above \$3,000 and earned incomes below \$3,000 get a credit of \$300; those with earned incomes between \$3,000 and \$14,000 get a credit of 10 percent of earned income; and those with earned incomes above \$14,000 get a credit of \$1,400.

Thus, the earned income credits allowed have only a very crude relationship to actual earned incomes and a number have

suggested abolishing the earned income credit. Since new defense taxes are likely to be levied on net income without an earned income credit, it seemed desirable to provide a means of making estimates either with or without the earned income credit. Accordingly, average earned income credit was estimated for each income bracket but was not subtracted from net income.

An examination of earned income credits allowed in several years (Basic Table 2, *Statistics of Income* for each year) revealed that about half of the income reported in excess of \$3,000 was counted as earned and that this proportion did not vary much with the income level considered. Average earned

INDIVIDUAL TABLE 6. AGGREGATE TAX BASE FOR INDIVIDUALS WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 80 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	Personal exemption	Earned income credit	Tax base with 1941 exemptions and earned income credit
1.....	158	745	10	(603)
2.....	598	1,221	50	(685)
3.....	1,201	1,532	120	(451)
4.....	1,849	1,841	184	( 86)
5.....	1,199	801	119	219
6.....	1,155	682	115	359
7.....	848	425	85	333
8.....	714	309	71	334
9.....	574	220	57	297
10.....	475	163	47	265
11.....	415	126	42	247
12.....	332	84	33	215
13.....	225	50	21	154
14.....	146	28	13	105
15.....	115	20	10	85
16.....	337	44	26	267
17.....	235	22	10	197
18.....	243	16	15	211
19.....	155	8	9	138
20.....	127	5	7	115
21.....	97	3	5	79
22.....	84	2	3	79
23.....	73	1	2	74
24.....	105	2	4	109
25.....	104		1	103
26.....	67			60
27.....	25			24
28.....	14			14
	11,229	7,811	1,652	2,266
				4,154

\* Classes grouped are below \$500,000.



income credits were therefore approximated in the following manner:

- A. For all average net incomes below \$3,000, a credit of 10 percent was taken.
- B. For average net incomes above \$25,000, a credit of \$1,400 was taken.
- C. For average net incomes between \$3,000 and \$25,000, 5 percent of the excess of net income over \$3,000 was added to \$300.

Average earned income credits computed in this way are shown in column 8 of Family Tables 2 to 5, and column 6 of Individual Tables 2 to 5.

**FAMILY TABLE 7. AGGREGATE TAX BASE FOR FAMILIES WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON A 90 BILLION-DOLLAR INCOME.**

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	1941 exemptions		Earned income credit	Tax base with 1941 exemptions and earned income credit
		Head of family	Credit for dependents		
1.....	55	1,806	602	6	(2,359)
2.....	949	4,683	2,035	94	(5,862)
3.....	2,155	5,809	2,879	216	(6,830)
4.....	3,524	6,641	3,294	354	(6,765)
5.....	4,148	6,028	2,894	414	(5,188)
6.....	3,764	4,449	2,219	377	(3,281)
7.....	3,668	3,638	1,805	366	(2,141)
8.....	3,395	2,945	1,453	340	(1,343)
9.....	2,942	2,206	1,112	294	( 670)
10.....	2,426	1,621	804	243	( 242)
11.....	3,566	2,041	1,088	351	29
12.....	2,349	1,154	613	233	349
13.....	1,601	681	367	148	405
14.....	1,036	388	226	91	331
15.....	711	237	120	59	285
16.....	1,973	562	275	149	1,047
17.....	1,661	290	139	112	1,120
18.....	1,550	205	110	98	1,137
19.....	1,647	91	49	61	846
20.....	624	53	29	47	636
21.....	709	34	19	32	624
22.....	631	24	13	29	571
23.....	353	10	6	10	327
24.....	882	16	9	15	842
25.....	509	5	3	5	416
26.....	228	1			225
27.....	125	} 1*	} 1*	} 1*	124
28.....	157				157
	46,878	45,648	22,174	4,139	(25,683)
					9,607

\* Classes grouped are below \$500,000.

INDIVIDUAL TABLE 7. AGGREGATE TAX BASE FOR INDIVIDUALS WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON A 90 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	Personal exemption	Earned income credit	Tax base with 1941 exemptions and earned income credit
1.....	177	745	18	(586)
2.....	664	1,221	67	(624)
3.....	1,348	1,532	185	(319)
4.....	1,513	1,241	161	121
5.....	1,345	661	134	350
6.....	1,298	682	130	486
7.....	952	425	95	432
8.....	801	300	80	412
9.....	644	230	66	330
10.....	533	163	53	317
11.....	466	136	47	298
12.....	372	84	25	258
13.....	352	50	22	180
14.....	164	28	14	122
15.....	139	20	10	90
16.....	378	44	28	305
17.....	265	29	18	225
18.....	273	16	17	230
19.....	174	8	10	156
20.....	142	5	8	129
21.....	106	3	5	100
22.....	94	2	3	89
23.....	89	1	2	84
24.....	185	2	4	180
25.....	117	} 1*	} 1*	116
26.....	76			75
27.....	28			27
28.....	16			16
	12,002	7,811	1,154	3,637
				5,169

\* Classes grouped are all under \$500,000.

#### EXEMPTIONS

In addition to his earned income credit each taxpayer is allowed a personal exemption. On 1940 incomes, these exemptions were \$800 for a single person, \$2,000 for a married person and \$400 for each dependent. On 1939 incomes they were, respectively, \$1,000, \$2,500 and \$500. In 1941, Congress lowered them to \$750, \$1,500 and \$400. There is some sentiment in favor of lowering them still further on 1942 incomes and various combinations of exemptions have been suggested. Accordingly, it was desired to be able to make estimates for any prospective combination of exemptions. This was done by first aggregating the net income of families and individuals in each income bracket by multiplying the average net income in each bracket by the estimated number of families or individuals in that bracket (column 4, Family and Individual Tables 1). These

aggregates are tabulated in column 1 of Family and Individual Tables 6, 7, 8 and 9. The 1941 head of family exemptions (column 2, Family Tables 6 to 9) were calculated by multiplying the estimated number of families in each bracket by the 1941 head of family exemption, \$1,500. Aggregate 1941 credits for dependents (column 3, Family Tables 6 to 9) were found by multiplying the average number of persons per family in each bracket (column 10, Family Table 1) less two by \$400, and the product by the estimated number of families. Aggregate exemptions for individuals in each bracket (column 2, Individual Tables 6 to 9) were obtained by multiplying the estimated numbers of individuals by \$750.

FAMILY TABLE 8. AGGREGATE TAX BASE FOR FAMILIES WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 100 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	1941 exemptions		Earned income credit	Tax base with 1941 exemptions and earned income credit
		Head of family	Credit for dependents		
1	72	1,806	602	7	(2,343)
2	1,074	4,682	2,635	106	(5,749)
3	2,426	5,809	2,879	244	(6,596)
4	3,949	6,641	3,294	394	(6,380)
5	4,646	6,028	2,804	466	(4,742)
6	4,200	4,449	2,219	421	(2,889)
7	4,092	3,638	1,805	410	(1,761)
8	3,788	2,945	1,453	379	( 989)
9	3,275	2,306	1,112	328	( 371)
10	2,702	1,621	804	270	7
11	3,902	2,041	1,089	360	383
12	2,614	1,154	613	246	601
13	1,782	681	367	157	577
14	1,152	388	226	96	442
15	791	237	130	63	361
16	2,192	502	275	160	1,256
17	1,847	290	139	121	1,207
18	1,721	205	110	107	1,290
19	1,162	91	49	67	855
20	915	53	29	50	786
21	787	34	19	32	702
22	700	24	13	23	640
23	391	10	6	10	365
24	978	16	9	15	938
25	665	5	3	5	652
26	253	1	1	1	250
27	139	1*	0	0	138
28	175	0	0	0	175
	52,290	45,648	22,174	4,568	(20,100)
					11,720

\* Classes grouped are under \$500,000.

INDIVIDUAL TABLE 8. AGGREGATE TAX BASE FOR INDIVIDUALS WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 100 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	Personal exemption	Earned income credit	Tax base with 1941 exemptions and earned income credit
1.....	198	745	20	(567)
2.....	735	1,221	73	(559)
3.....	1,495	1,532	149	(189)
4.....	1,682	1,241	109	272
5.....	1,492	861	149	462
6.....	1,440	622	144	614
7.....	1,055	425	105	525
8.....	899	309	89	491
9.....	715	220	71	424
10.....	591	163	59	399
11.....	516	126	51	339
12.....	413	84	37	292
13.....	290	50	24	206
14.....	191	28	15	138
15.....	143	20	11	112
16.....	419	44	20	345
17.....	293	22	19	252
18.....	301	16	18	267
19.....	192	8	11	173
20.....	158	5	8	145
21.....	120	3	5	112
22.....	104	3	3	99
23.....	97	1	3	93
24.....	203	3	4	209
25.....	139	1*	1	129
26.....	64	1*	1*	63
27.....	31	1*	1*	30
28.....	18	1*	1*	18
	13,979	7,811	1,270	4,893
				6,219

\* Classes grouped are under \$500,000.

### RESULTS

Average earned income credits were converted to aggregates and tabulated (column 4, Family Tables 6 to 9, and column 3, Individual Tables 6 to 9). The tax base in each bracket could then be computed by subtracting aggregate exemptions and earned income credit from aggregate net income. This was done and the results tabulated in column 5 of Family Tables 6 to 9, and column 4 of Individual Tables 6 to 9. Negative numbers are enclosed in parentheses. To get the tax base for any of the assumed levels of income, one needs only add the positive numbers in the family and individual columns for that level of income. The totals immediately at the foot of these columns are algebraic sums of both positive and negative numbers presented for convenience in checking. Below these totals appear the totals of only positive numbers.

FAMILY TABLE 9. AGGREGATE TAX BASE FOR FAMILIES WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 110 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	1941 exemptions		Earned income credit	Tax base with 1941 exemptions and earned income credit
		Head of family	Credit for dependents		
1.....	85	1,800	602	8	(2,337)
2.....	1,242	4,682	2,035	125	(5,600)
3.....	2,729	5,806	2,879	275	(6,324)
4.....	4,365	6,641	3,294	438	(6,608)
5.....	5,164	6,028	2,804	514	(4,272)
6.....	4,681	4,419	2,219	469	(2,456)
7.....	4,629	3,639	1,805	454	(1,369)
8.....	4,165	2,946	1,453	416	( 650)
9.....	3,617	2,206	1,112	362	( 63)
10.....	2,968	1,621	804	298	265
11.....	4,306	2,041	1,068	419	758
12.....	2,907	1,155	613	261	678
13.....	1,979	681	367	167	764
14.....	1,278	388	226	103	561
15.....	874	237	130	67	440
16.....	2,410	501	275	170	1,464
17.....	2,033	290	139	131	1,473
18.....	1,694	205	110	115	1,464
19.....	1,280	91	49	73	1,067
20.....	1,006	52	29	50	873
21.....	866	35	19	32	780
22.....	766	24	13	23	706
23.....	429	10	6	10	403
24.....	1,073	16	9	15	1,033
25.....	621	5	3	5	608
26.....	277				274
27.....	152	} 1*	} 1*	} 1*	152
28.....	191				191
	57,906	45,650	22,174	5,001	(14,919)
					14,154

\* Classes grouped are below \$500,000.

Thus, our estimate of income tax base (under the assumptions of a 90 billion-dollar national income, 1941 exemptions and an earned income credit) is 14,773 million dollars—9,607 million dollars from Family Table 7, and 5,166 million dollars from Individual Table 7. This would mean tax revenue of \$590,900,000 under the present 4 percent rate. Estimates under other exemptions can also be obtained from this table. An estimate of revenue from a tax allowing, for example, exemptions of \$400 for a single individual, \$1,000 for a married person, \$200 for each dependent and no earned income credit can readily be obtained by determining which income classes are taxable, taking subtotals of net income and exemptions for these classes and subtracting the proper fraction of the exemp-

tions from the net income. This, when done for both families and individuals, gives the tax base to which the rate is applied to estimate the tax yield.

In this particular example, the head of family exemption is two-thirds the 1941 exemption and the credit for dependents is one-half the 1941 credit. From Family Table 7 it can be seen that families in classes 7-28 would be taxable under these provisions. Subtotals of the net income, head of family exemptions, and credit for dependents columns are 32,283 million dollars, 16,144 million dollars, and \$8,251. By subtracting two-thirds of the second and one-half of the third from the first, a tax base for families of 17,394 million dollars is obtained. In similar fashion a tax base of \$8,090 for individuals is obtained from subtotals of classes 2-28 of Individual Table 7.

INDIVIDUAL TABLE 9. AGGREGATE TAX BASE FOR INDIVIDUALS WITH EARNED INCOME CREDIT AND EXEMPTIONS WHICH APPLIED TO 1941 INCOMES ON AN 110 BILLION-DOLLAR INCOME.

(Money Figures in Millions of Dollars.)

Class No.	Tax base with no exemptions or earned income credit	Personal exemption	Earned income credit	Tax base with 1941 exemptions and earned income credit
1.....	219	746	21	(564)
2.....	806	1,220	81	(490)
3.....	1,648	1,633	166	( 49)
4.....	1,847	1,241	166	421
5.....	1,640	861	164	615
6.....	1,580	692	158	740
7.....	1,157	424	115	618
8.....	977	310	97	570
9.....	784	230	78	486
10.....	650	163	65	422
11.....	567	125	56	360
12.....	453	84	45	230
13.....	308	49	25	234
14.....	199	28	16	155
15.....	158	20	12	126
16.....	461	44	32	365
17.....	323	22	21	279
18.....	331	16	20	295
19.....	211	7	12	192
20.....	173	4	8	161
21.....	132	3	5	124
22.....	115	2	3	110
23.....	107	1	2	103
24.....	226	2	4	220
25.....	143			141
26.....	92			92
27.....	34			24
28.....	26			26
	15,253	7,807	1,368	6,162
				7,292

\* Classes grouped are below \$500,000.

TABLE 10. YIELD OF 10 PERCENT NORMAL TAX AT VARIOUS INCOME LEVELS UNDER VARIOUS EXEMPTIONS, WITH AND WITHOUT EARNED INCOME CREDIT.

(Figures in Millions of Dollars.)

Class No.	Exemptions	80 billion-dollar national income		90 billion-dollar national income		100 billion-dollar national income		110 billion-dollar national income	
		With earned income credit	Without earned income credit	With earned income credit	Without earned income credit	With earned income credit	Without earned income credit	With earned income credit	Without earned income credit
1.	1,000, 2,500, 400.....	952	1,078	1,160	1,320	1,395	1,532	1,650	1,888
2.	800, 2,000, 400.....	1,065	1,238	1,328	1,525	1,602	1,830	1,995	2,170
3.	750, 1,500, 400.....	1,208	1,390	1,478	1,720	1,792	2,092	2,142	2,489
4.	500, 1,000, 200.....	1,742	2,048	2,155	2,525	2,608	3,030	3,068	3,560
5.	400, 1,000, 200.....	1,820	2,125	2,283	2,605	2,688	3,118	3,176	3,676
6.	200, 500, 100.....	2,855	3,275	3,405	3,900	3,990	4,535	4,602	5,204
7.	no exemptions.....	4,808	5,280	5,418	5,948	6,042	6,628	6,688	7,326

TABLE 11. INCIDENCE OF PRESENT INCOME TAX AND AN ADDITIONAL 10 PERCENT NORMAL TAX ON FAMILIES IN VARIOUS INCOME BRACKETS AT A 90 BILLION-DOLLAR INCOME LEVEL.

Income	Av. income	Av. tax under Revenue Act of 1941	Income net of 1941 Federal Income tax	Av. tax under additional 10% normal tax	Income net of added 10% tax
-----	163	0	163	0	163
-----	538	0	538	0	538
-----	873	0	873	0	873
-----	1,215	0	1,215	0	1,215
-----	1,557	0	1,557	0	1,557
-----	1,896	0	1,896	0	1,896
-----	2,241	0	2,241	0	2,241
-----	2,542	0	2,542	0	2,542
-----	2,937	0	2,937	0	2,937
-----	3,292	1	3,291	0	3,291
-----	3,774	18	3,756	2	3,754
-----	4,461	75	4,386	75	4,311
-----	5,154	109	5,045	89	4,956
-----	5,830	149	5,681	123	5,558
-----	6,551	208	6,343	180	6,163
-----	8,179	287	7,792	313	7,479
-----	11,932	352	11,060	578	10,502
-----	15,781	1,458	14,323	833	13,495
-----	24,091	2,274	20,817	1,897	19,490
-----	30,973	3,682	25,291	1,965	23,326
-----	39,837	5,240	29,597	2,710	27,187
-----	50,069	13,733	36,336	3,543	32,793
-----	66,248	20,892	45,356	4,787	40,569
-----	99,283	39,751	59,532	7,094	51,838
-----	133,573	64,823	68,750	14,367	54,383
-----	396,075	204,763	191,312	31,132	162,180
-----	782,909	430,714	352,196	60,833	291,363
-----	2,643,902	1,536,496	1,107,406	201,456	906,950
-----	4,397,266	2,352,730	2,044,536	332,032	1,712,464

This gives a total tax base of \$24,484 for an income tax of this kind. Similar estimates for other income taxes have been made from Family and Individual Tables 6 to 9 and the estimated revenues at a 10 percent rate have been listed in table 10.

The exemptions levels presented in table 10 are presented because of their historical or prospective use. The first set applied to incomes received from 1932 to 1939. The second set applied to 1940 incomes. The third set has been approved for 1941 incomes by Congress and the President. The fourth set was suggested by Miss Mabel Newcomer in *Facing the Tax Problem* (The Twentieth Century Fund, New York, 1940). The next set is exactly half the 1940 exemptions and was recommended to the Senate Finance Committee by Edward S. O'Neal, President of the American Farm Bureau Federation. The exemptions in the sixth row are exactly one-fourth those allowed in 1940 and might have to be considered if defense spending



goes to hitherto unapproached sums and brings proportionally greater dangers of inflation. The last row gives estimates for a tax allowing no exemptions. Before authorities lower exemptions to anything approaching those in row 6, there will be considerable increases in rate. Since tax base for a particular year is not affected by the rate, estimates of revenue at various rates can be obtained by multiplying revenue at the 10 percent rate by the proper ratio. Estimates may also be

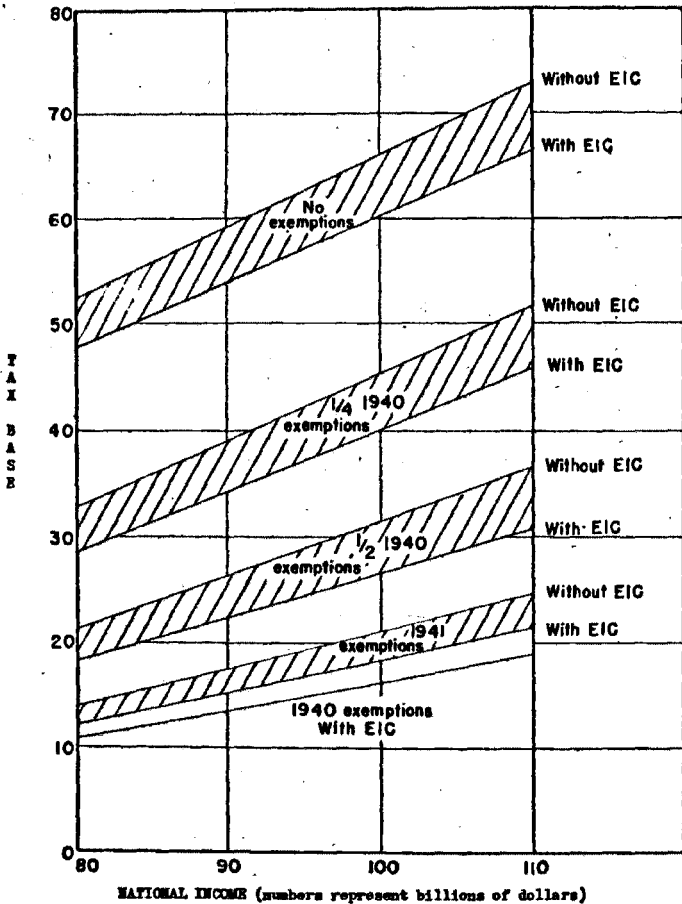


Fig. 2. Effect of exemptions and earned income credit on tax base.

taken from fig. 2 which shows the tax bases from which lines 2, 3, 5 and 7 were computed. When tax base is plotted against national income, the line is slightly concave upwards; but is so nearly straight that interpolations for income levels between 80 billion and 110 billion dollars can safely be made from fig. 2.

## II. EXAMINATION OF THE METHOD

In common with all other estimates, the foregoing figures are based on less than completely satisfactory data. Where data are completely satisfactory, estimates are not needed. To begin with, the result of the *Consumer Incomes* and *Consumer Expenditures* studies are taken as data and, therefore, the present study contains all the qualifications of those studies. The investigator's plea that these data represent the best available on the subject justifies using them but does not remove the qualifications.

Other than this, the two steps in the procedure, which imply the most sweeping generalizations and which might reasonably be questioned, are the inflation of population and income in each class by constant ratios and the assignment of an average income, average understatement, average deductions, etc., to every individual or family in a particular income class. Other steps involve many possible sources of error. To attempt to discover each would be an endless task. The attempt in this section is to discuss those in which the critical reader is likely to be most interested and to give him some idea of the magnitude of possible deviations involved. Where examples are used, approximations on only the 90 billion-dollar national income level are worked out, since it is very close to the actual 1941 income.

### INFLATING THE 1935-36 DISTRIBUTION

One point of interest in connection with the way the numbers and incomes of each bracket were obtained is the effect of increased population. This is not as interesting from the standpoint of checking a possible error in the procedure as in determining to what extent the results calculated for 1941 are applicable to succeeding years. Population increased about  $3\frac{1}{2}$  percent from 1935-36 to 1941. It will probably be at least 5 years before another  $3\frac{1}{2}$  percent increase is realized, so if the computations for 1941 would have been substantially the same without the population correction, then the calculations based on the 1941 population may be used to estimate revenue for several succeeding years.

To test the magnitude of the population effect, a calculation was made for the 90 billion-dollar income on the basis of 1935-

36 numbers of families and individuals. This changed the per-capita income ratio to 1.438941. Revenue under 1940 exemptions turned out 1,365 million dollars as compared with our previous figure of 1,328 million dollars. Revenues under half- and quarter-1940 exemptions became 2,293 million dollars and 3,465 million dollars, respectively, as compared with 2,232 million dollars and 3,405 million dollars. Revenue under the assumption of no exemptions and no earned income credit (the above figures are with earned income credit) is 5,947 million dollars under this method as compared with 5,418 million dollars obtained previously. The indication is that, while it was worth while to make the population correction as between 1935-36 and 1941, to use calculations for the proper income level (or interpolations from fig. 2) and 1941 population would not involve serious error in 1942 and 1943 when both population and national income will be closer to the 1941 figures than the 1941 figures were to the 1935-36 figures.

A step in the method which might involve serious error is the multiplication of the average incomes of each class by the

TABLE 12. AVERAGE INCOMES OF THE VARIOUS INCOME CLASSES UNDER THE ESTIMATED 1941 DISTRIBUTION, A LESS EQUAL DISTRIBUTION AND A MORE EQUAL DISTRIBUTION.

Class No.	Less equal distribution Dollars	Estimate of 1941 distribution Dollars	More equal distribution Dollars
1.....	(116)	163	440
2.....	311	538	765
3.....	692	873	1,054
4.....	1,080	1,215	1,350
5.....	1,469	1,567	1,645
6.....	1,854	1,896	1,938
7.....	2,240	2,241	2,239
8.....	2,589	2,542	2,499
9.....	3,037	2,937	2,837
10.....	3,440	3,292	3,144
11.....	3,988	3,774	3,550
12.....	4,708	4,461	4,153
13.....	5,556	5,154	4,753
14.....	6,324	5,830	5,336
15.....	7,143	6,551	5,960
16.....	8,993	8,179	7,396
17.....	13,257	11,932	10,606
18.....	17,630	15,781	13,933
19.....	27,073	24,091	20,812
20.....	34,801	30,973	27,057
21.....	44,230	39,237	34,196
22.....	56,578	50,059	43,544
23.....	74,969	66,248	57,529
24.....	112,502	99,283	86,067
25.....	206,271	183,573	158,883
26.....	451,982	398,075	344,294
27.....	899,318	792,909	678,629
28.....	3,003,624	2,643,902	2,284,279
	4,987,502	4,397,266	3,806,854

TABLE 13. REVENUE FROM A 4 PERCENT NORMAL TAX ON AN ASSUMED 90 BILLION-DOLLAR NATIONAL INCOME FOR THREE DISTRIBUTION ASSUMPTIONS AND FOUR EXEMPTION LEVELS.

(Figures in Millions of Dollars.)

	Less equal distribution Dollars	Estimate of 1941 distribution Dollars	More equal distribution Dollars
1940 exemptions			
with earned income credit.....	605	531	465
One-half 1940 exemptions			
without earned income credit.....	1,124	1,024	900
One-fourth 1940 exemptions			
without earned income credit.....	1,566	1,500	1,521
No exemptions			
no earned income credit.....	2,357	2,379	2,376

per-capita income ratio. This, as has already been pointed out, assumes income distributions of equal concentration<sup>6</sup> in 1935-36 and 1941. This assumption was made because it was believed to yield the best estimate of distribution of income in 1941.<sup>6</sup>

If the true distribution of income is less concentrated than the distribution used, revenue tends to be overstated; and to use a distribution less concentrated than the true distribution causes revenue to be understated. It is possible to get a rough idea of the probable size of this error by making calculations for distributions showing both more and less concentration than the one used in the preceding section. This was done for two assumed distributions of a 90 billion-dollar national income. In table 12, average incomes of each class under these distributions are compared with those under the distribution of the preceding section. The more equal distribution was obtained by multiplying each of the 1935-36 average incomes by 1.20083 and adding \$300. Average incomes under the assumption of less equally distributed income were obtained by multiplying each 1935-36 average by 1.57935 and subtracting \$300. The reader will recall that the original averages for the 90-billion-dollar level were obtained by multiplying the 1935-36 averages by 1.390064. These three operations each result in the same total income. Table 13 compares revenue under different exemptions

<sup>6</sup>So far as the writer knows, there is no universally accepted measure of concentration of income. The two most commonly used are the slope of a Pareto line and Gini's concentration ratio. Gini's ratio, which this writer prefers, is the same for the 1935-36 distribution and the assumed 1941 distribution. For a discussion and bibliography on this subject see chapter 2 of *The Theory of Econometrics* (The Principia Press, Bloomington, Ind., 1941) by Harold T. Davis.

<sup>7</sup>This belief was strengthened by Professor Milton Friedman's opinion on the subject expressed in a letter to Dr. Albert G. Hart; by the fact that Gerhard Colm and Helen Tarasov used the same assumption in their monograph, *Who Pays the Taxes?* (Temporary National Economic Committee, Washington, 1940); and by the close correspondence between the 1935-36 distribution and the 1929 distribution as determined by the Brookings Institution and presented in *America's Capacity to Consume* (The Brookings Institution, Washington, 1934).

and these three distribution assumptions. While these results confirm the suspicion that appreciable error in estimates of revenue might be caused by using an inaccurate distribution, it should be remembered that the two distributions presented are probably fairly extreme. Reliable data on year to year changes in income distribution simply do not exist.

#### AVERAGING

An even more troublesome source of error is the procedure of assigning to each member of an income class an average income, an average amount of imputed income, an average amount of understatement, etc. Assuming that the inflating process examined above gave the correct number of families and the correct average incomes and limits, the investigator would still be bothered by the fact that there is considerable dispersion about the average incomes, average imputed incomes, average understatement, average deductions, etc. In some of these cases, the data do not even give the limits of dispersion.

As an example of this type of error, consider the estimate of tax base under a 90 billion-dollar income, 1940 exemptions and an earned income credit. According to Family Table 7, families in income class 12 pay no tax under these assumptions. Yet some families in this class have cash incomes of about \$4,800, do not understate their incomes, have only small amount of deductions and have no dependents. Families in this position are actually taxable on about \$2,000; but for purposes of the above estimates their tax liability has been averaged away by virtue of their being included in an income class in which many of the families have incomes too small to be taxable.

Class 12 was subdivided into a large number of smaller groups to show the approximate size of this error. It was first divided into five subclasses with different average incomes. These were each divided into three groups by assuming that one-fourth of each subclass understated their incomes by \$2,000, one-fourth understated by \$1,000 and one-half did not understate. This resulted in 15 subclasses which were split into 30 smaller groups by assuming that one-sixth of each subclass had \$430 worth of imputed income due to home-produced food and the rest had no home-grown food. Imputed food was only tabulated for farm families in *Consumer Incomes* and the tabulation in table 108, page 97, shows that about one-sixth of the members of class 12 are farmers.

Half the families were allowed \$420 for the rental value of owned homes and the other half were assumed to be renters. Division on this basis brought the number of subgroups to 60. Three levels of deductions were allowed and four levels of

exemptions<sup>7</sup> bringing the number of subgroups to 720, of which 234, representing 320 thousand people and 340 million-dollars of tax base, were taxable according to this method of calculation. On the assumption that dispersion about the average is the same in classes 11 and 10 as in class 12, there appeared to be about 190 million-dollars of tax base in class 11 and about 25 million-dollars in class 10. Tax base in classes below 10 is negligible.

But these are not the only classes in which the averaging process causes error. In classes just above 12, some families have incomes smaller than the sum of their deductions, exemptions, imputed incomes, etc. In the averaging process, their negative taxable incomes were automatically deducted from the positive taxable incomes of other families in the same income classes. By subdividing class 13 by the same procedure applied to 12, tax base in class 13 was estimated to be understated by about 210 million dollars because of averaging. Tax bases in family classes 14 and 15 were estimated to be underestimated by about 60 million dollars and 15 million dollars, respectively. In a class in which everyone pays a tax, computation of tax base by assigning averages does not involve error. Understatement of one person's tax liability involves overstatement of someone else's by the same amount.

The problem is similar but less acute in the case of individuals, since exemptions are uniform and there are no imputed incomes. Individual classes 3 and 4 were subdivided into 60 groups each and from these subdivisions it was estimated that understatement due to averaging was about 10 billion dollars in class 3, 160 billion dollars in class 4 and 10 billion dollars in class 5. This makes a total underestimate of nearly one billion dollars of tax base, or 40 million dollars of tax revenue, which is a fairly serious source of error on a total tax base estimated at 13.3 billion dollars and revenue estimated at 531 million dollars.

#### NONREPORTING

A possible source of error in the opposite direction lies in the fact that no allowance was made to correspond to the adjustment of *Consumer Incomes* data for nonreporting. The reasons were that the understatement and nonreporting corrections listed in *Consumer Incomes* (p. 84) appeared very large and that the investigators were primarily interested in estimates under lowered exemptions and more efficient administration which should largely eliminate nonreporting.

<sup>7</sup>Exemptions of \$2,000, \$2,560, \$3,360 and \$4,440 were allowed to 2, .5, 2, and .1 of the families, respectively. Information underlying this decision is in table 4, p. 31 and table 6B, p. 97 of *Consumer Incomes in the United States*.

TABLE 14. EFFECT OF NONREPORTING CORRECTION ON ESTIMATED TAX REVENUE UNDER A 90 BILLION-DOLLAR NATIONAL INCOME AND A 4 PERCENT RATE FOR VARIOUS EXEMPTION LEVELS WITH NO EARNED INCOME CREDIT.

(Revenue Figures in Millions of Dollars.)

Class No.	Exemption level	Estimated revenue without nonreporting correction	Estimated revenue with nonreporting correction
1.	1,000, 2,500, 400.....	529	480
2.	800, 2,000, 400.....	610	552
3.	750, 1,500, 400.....	688	618
4.	500, 1,000, 200.....	1,010	878
5.	400, 1,000, 200.....	1,042	905
6.	200, 500, 100.....	1,560	1,296
7.	no exemptions.....	2,379	1,975

However, it is of interest to know what effect it would have had on the estimates to have reversed the *Consumer Incomes* adjustments. This would have reduced the number of individuals and families in classes 13, 14, 15 and 16 by 20 percent; class 17, by 13 percent; and class 18, by 4.8 percent. The National Resources Committee adjustments were concerned only with incomes above \$5,000. Since it is unlikely that persons with lower incomes are any more conscientious about filing returns, the 20 percent reductions were also applied to classes 1 to 12 in the nonreporting approximation.

Table 14 compares the revenue estimates of the previous section for the 90 billion-dollar income level with the estimates that would have been obtained had the nonreporting adjustment been made as described above. Nonreporting on the scale assumed above could only occur under a very lax tax administration so the differences due to nonreporting in table 14 can be viewed as extreme.

#### LOSS OF SURTAX ASSOCIATED WITH HIGH NORMAL TAX RATES

In the first section the reader was invited to make estimates of the yields of income taxes of various rates by multiplying the yield of a 10 percent tax, as shown in table 10, by the proper ratios. However, if the rate for which estimates are desired is too large, some adjustment must be made to keep persons in the highest income classes from being required to pay tax at a total rate (normal rate plus surtax rate) of more than 100 percent on their last increments of income. For example, if the normal rate were raised to 30 percent and no surtax adjustments were made, persons with surtax net incomes above \$5,000,000 would pay 107 percent on the excess. All persons

with surtax net incomes above \$300,000 would be taxed at more than 100 percent on the portion of their incomes above \$300,000.

There is every reason to tax such high incomes at a very high rate, but rates in excess of 100 percent do not make sense. In levying a high normal tax Congress would undoubtedly make some adjustment of surtax rates. This would involve a loss of surtax revenue which needs to be deducted from estimated normal tax revenue to estimate the net addition to tax revenue occasioned by the rate in question.

If one supposes that the present surtax schedules (passed by Congress in September, 1941) would be maintained up to the point where increments of income were taxed at a total rate of 90 percent, and that increments of income above that level would be taxed at a total rate of 90 percent, some adjustment of surtax rates would have to be made when the normal tax rate became higher than 13 percent. From the schedule of surtax rates in table 12, it can be seen that if the normal rate were 15 percent, surtax rates above the \$2,000,000 level would have to be adjusted; if the normal rate were 30 percent, rates above the \$70,000 net income level would have to be adjusted. If it is supposed, however, that Congress would make the total rate ceiling 100 percent instead of 90 percent, then no adjustment of surtax rates would need to be made until the normal rate exceeded 23 percent. At a normal rate of 30 percent, adjustments would need to be made in surtax rates on net incomes above \$300,000; and at a normal rate of 40 percent, adjustments would need to be made above \$70,000.

The amount of surtax revenue that would be lost by the adjustments necessary to keep the total rate ceiling at 90 percent is shown in table 13 for several normal tax rates. Column 4 of this table shows the amount which would be added to tax revenue by raising the normal tax rate from 4 percent to the percent indicated in column 1. Each figure in column 4 was obtained by subtracting the loss of surtax revenue (shown in column 3) and the 688 million dollars raised by the present 4 percent normal tax from the estimated yield of the assumed normal tax.

Similar figures are shown in table 14 for the case in which the combined normal and surtax rate is allowed to go to 100 percent. This would establish a net income ceiling of \$26,720 if the normal rate were 30 percent, a ceiling of \$11,020 if the normal rate were 40 percent and a net income ceiling of \$6,100 if the normal rate were 50 percent.

The procedure used in calculating the loss of surtax in these tables is of some interest since a similar procedure could be used to estimate yields of various combinations of surtax rates.



TABLE 15. SURTAX RATES WHICH APPLY TO 1941 INCOMES.  
(Class Limits in Thousands of Dollars.)

Surtax net income		Surtax rate on income within limits (%)	Surtax net income		Surtax rate on income within limits (%)
exceeding	not exceeding		exceeding	not exceeding	
0	2	6	50	60	57
2	4	9	60	70	59
4	6	13	70	80	61
6	8	17	80	90	63
8	10	21	90	100	64
10	12	25	100	150	65
12	14	29	150	200	66
14	16	32	200	250	67
16	18	35	250	300	69
18	20	38	300	400	71
20	22	41	400	500	72
22	26	44	500	750	73
26	32	47	750	1,000	74
32	38	50	1,000	2,000	75
38	44	53	2,000	5,000	76
44	50	55	5,000	and up	77

Source: Revenue Act of 1941, 77th Congress, 1st Session, Washington, 1941.

The difficult part of the problem is estimating the number of persons and the aggregate net incomes of persons in each surtax bracket. This must be done since a different rate applies to each surtax bracket. The reader will recall that, in the first section, the number of families and the number of individuals was estimated in each of 28 gross income brackets for the 1941 population and an assumed 90 billion-dollar national income. Average net incomes were then calculated by deducting average values for non-cash incomes, understatement and deductions. Average surtax net income is this value less average exemptions, which were also calculated.

As was shown on page 812, individual deviations from these average values mean that individuals in any income class become more dispersed as successive averages are deducted. For example, family class 20 includes families with gross incomes between \$27,801 and \$34,752 with national income at 90 billion dollars. Yet, assuming that some families near the upper limit have no non-cash income, do not understate and have low deductions and exemptions, while some families near the lower limit have considerable non-cash income, understate their incomes and have high deductions and exemptions, it is quite likely that surtax net incomes for these families range from about \$15,000 to about \$30,000.

If average non-cash incomes, understatements, deductions and exemptions are deducted from the upper and lower gross income limits of class 20, surtax net income limits of \$17,974 and \$24,224 are obtained. While all families of class 20 will not

have have surtax net incomes within these limits, the bulk of them will; and those whose incomes are outside the limits will tend to be replaced by families with gross incomes in classes 19 and 21. It is, therefore, reasonable to suppose that the number of families with surtax net incomes between \$17,974 and \$24,224 is very close to the number with gross incomes between \$27,801 and \$34,752 and that their average surtax net income is very close to \$20,966 which is obtained by subtracting \$2,308, the average exemptions in family class 20, from \$23,274, the average net income in family class 20 as shown in column 7 of Family Table 3.

If a similar procedure is applied to each gross income class, distributions of families and individuals by surtax net income classes are obtained. The limits of these classes, however, do not correspond to the limits of the surtax brackets given in table 12. Some method is needed to estimate the numbers and aggregate incomes of families and individuals in each surtax bracket.

If knowledge of the family income distribution were complete, a distribution curve could be drawn showing the number of families having incomes of each particular size. Conventionally, income would be shown on the horizontal axis and number of families on the vertical axis. The area under such a curve between any two points on the horizontal scale would represent the number of families with incomes between the two limits chosen on the horizontal scale. This is analagous to the representation of the proportion of cases falling within certain limits by the area under a probability curve in statistical tests of significance. On a family income distribution curve as described above, the area under the curve between income limits \$17,974 and \$24,224 would be very close to \$30,973, since that is our estimate of the number of families in family class 20. For surtax estimates the number of families between the limits of \$18,000 to \$20,000, the number of families between the limits \$20,000 to \$22,000, etc. is needed for each surtax bracket.

If one assumes that the distribution curve between the limits \$17,974 and \$24,224 can be closely approximated by a straight line, then it can be represented by an equation,  $y = a + bx$ . The number of persons between any limits inside the \$17,974 and \$24,224 limits is then  $\int_1^u (a + bx)dx$  where  $u$  and  $1$  are the upper and lower limits desired. This integral can be written  $au + \frac{bu^2}{2} - a1 - \frac{b1^2}{2}$  and can be evaluated if  $a$  and  $b$  are known. The aggregate income of families in class 20 can

be represented as  $\int_{17,974}^{24,224} (ax + bx^2)dx$ . This quantity must be equal to the average surtax net income in family class 20 times the number of families in class 20, i.e.,  $\$20,966 \times 35,410 = \$742,406,060$ .

This gives two equations in a and b —

$$\int_{17,974}^{24,224} (a + bx)dx = 35,410$$

$$\int_{17,974}^{24,224} (ax + bx^2)dx = 742,406,060$$

When solved simultaneously, the equations determine  $a = 10.546$  and  $b = -.0002313$ . Knowing a and b enables one to split family class 20 into any desired number of subclasses with any desired income limits.

Similar operations on the other family and individual classes enabled the writer to convert the family and individual distributions to new surtax net income distributions with classes which correspond to the surtax brackets shown in table 12. An examination of the results led to the belief that the linearity assumption on which the procedure is based is not applicable to very high income classes. Accordingly, families and individuals with surtax net incomes over \$80,000 were lumped and redistributed among the surtax brackets above \$80,000, according to the proportions among numbers of taxpayers in these brackets in 1936, 1937 and 1938 as shown in *Statistics of Income*. This appeared permissible since, in the very highest income brackets, the proportion of these highest returns in each bracket did not seem to bear any significant relation to the size of national income. When the surtax net income distributions had been calculated for actual surtax brackets, the effects of adjustments in surtax rates could readily be calculated with the results shown in tables 16 and 17.

TABLE 16. LOSS OF SURTAX REVENUE AT VARIOUS NORMAL TAX RATES WHEN NORMAL RATE PLUS SURTAX RATE IS NOT ALLOWED TO EXCEED 90 PERCENT, UNDER THE ASSUMPTION OF A 90 BILLION-DOLLAR NATIONAL INCOME, 1941 EXEMPTIONS AND NO EARNED INCOME CREDIT.

(Money Figures in Millions of Dollars.)

Normal rate (%)	Estimated revenue	Loss of surtax revenue	Addition to revenue due to changes in rate
20	3,440	9	2,740
30	5,160	69	4,400
40	6,880	208	5,960
50	8,600	439	7,470

TABLE 17. LOSS OF SURTAX REVENUE AT VARIOUS NORMAL TAX RATES WHEN NORMAL RATE PLUS SURTAX RATE IS NOT ALLOWED TO EXCEED 100 PERCENT, UNDER THE ASSUMPTION OF A 90 BILLION-DOLLAR NATIONAL INCOME, 1941 EXEMPTIONS AND NO EARNED INCOME CREDIT.

(Money Figures in Millions of Dollars.)

Normal rate (%)	Estimated revenue	Loss of surtax revenue	Addition to revenue due to changes in rate
30	5,100	9	4,400
40	6,880	69	6,130
50	8,600	208	7,700

### III. HISTORICAL TEST OF THE METHOD

Section II has indicated the possible order of magnitude of several types of error associated with the procedure described in Section I. Section III is an attempt to give the reader a better idea of the reliability of the method by using it to estimate normal tax revenue from 1934 to 1939 and comparing these estimates with actual revenue as recorded in *Statistics of Income* for each year.

#### NORMAL TAX REVENUE FOR 1934

A calculation following the procedure described in Section I was carried out for the 1934 national income of 54 billion dollars and population of 126,626,000. Exemptions of \$1,000 for a single person, \$2,500 for a married couple and \$400 for each dependent were allowed. The tax base thus calculated was 5,017 million dollars.

Revenue calculated directly from this base, however, would not be comparable to revenue actually obtained by the Federal Government since dividends and interest on government instrumentalities were exempted from the normal tax in 1934. In addition, incomes on which the estimate is based do not include capital gains or losses. To make the estimate of tax base comparable with that which existed in 1934, it should be reduced by the amount of tax exempt interest and the amount of dividends received by 1934 taxpayers and should be increased by the excess of statutory capital gains over statutory capital losses. Statutory capital gains are virtually certain to exceed statutory capital losses as explained on page 787. A comparison between the estimate adjusted for these quantities and actual revenue follows:

## (FIGURES IN MILLIONS OF DOLLARS.)

1934 tax base as computed .....	5,017
Less: Tax exempt interest .....	294
Dividends .....	1,454
Add: Excess of statutory net capital gains over statutory net capital losses.....	55
Adjusted tax base .....	3,324
Estimated normal tax revenue .....	133
Actual normal tax revenue .....	123

The data on dividends, capital gains and capital losses include all those reported on taxable returns. They are tabulated on page 3 of *Statistics of Income Supplement Compiled from Income Tax Returns for 1934*, Section II (Division of Tax Research of the United States Treasury Department, Washington, 1940). The figure for tax exempt interest includes reported tax exempt interest on all returns with net income above \$5,000, as listed on page 18 of *Statistics of Income for 1934*.

## NORMAL TAX REVENUE FOR 1935

A similar estimate was made for the 1935 population of 127,521,000 and national income of 58,809 million dollars. Figures for tax-exempt interest, dividends and statutory capital gains and losses could be found only for net income classes above \$5,000 and were taken from *Statistics of Incomes for 1935*, part 1, pp. 28 and 68-90.

## (FIGURES IN MILLIONS OF DOLLARS.)

1935 tax base as computed .....	5,762
Less: Tax exempt interest .....	282
Dividends .....	1,814
Add: Excess of statutory net capital gains over statutory net capital losses .....	331
Adjusted tax base .....	3,997
Estimated normal tax revenue .....	160
Actual normal tax revenue .....	153

## NORMAL TAX REVENUE FOR 1936

In 1936, dividends became taxable. Data on capital gains and losses for all taxable incomes in 1936 are available in *Statistics of Income Supplement Compiled from Income Tax Returns for 1936*, Section I, (Division of Tax Research of the United States Treasury Department, Washington, 1940) p. 6. The figure for tax exempt interest is for net income classes over \$5,000 and comes from page 30 of part 1 of *Statistics of Incomes for 1936*. The actual normal tax yield may be found on page 84 of *Statistics of Income*. Population in 1936 was 128,429,000 and national income was 67,846,000 million dollars.

## (FIGURES IN MILLIONS OF DOLLARS.)

1936 tax base as computed .....	7,358
Less: Tax exempt interest .....	269
Add: Excess of statutory net capital gains over statutory net capital losses .....	821
Adjusted tax base .....	7,910
Estimated normal tax revenue .....	316
Actual normal tax revenue .....	330

## NORMAL TAX REVENUE FOR 1937

In 1937 national income stood at 71,783 million dollars, population at 129,257,000. Tax exempt interest, capital gains and capital losses for net incomes above \$5,000 were obtained from *Statistics of Income for 1937*, part 1, pp. 135, 136 and 162. Actual normal tax yield appeared on page 118.

## (FIGURES IN MILLIONS OF DOLLARS.)

1937 tax base as computed .....	8,089
Less: Tax exempt interest .....	301
Add: Excess of statutory net capital gains over statutory net capital losses .....	185
Adjusted tax base.....	7,973
Estimate of normal tax revenue .....	319
Actual normal tax revenue .....	335

## NORMAL TAX REVENUE FOR 1938

The introduction of the alternative tax in 1938 makes the comparison for that year of little value. The alternative tax takes the place of both normal and surtax for many taxpayers having long-term capital gains or losses. *Statistics of Income for 1938* (preliminary edition) gave no indication of the respective amounts of normal tax and surtax replaced by the alternative tax. Presumably, most persons who pay alternative tax are in the higher income brackets and most of the alternative tax replaces surtax.

Figures for capital gains, capital losses and revenue from normal tax, surtax and alternative tax were obtained from the preliminary report of *Statistics of Income for 1938*. The 275 million-dollar tax exempt interest was estimated from the 1938 figure of 42 million dollars partially tax-exempt interest in comparison with figures for wholly and partially tax-exempt interest in previous years. Tax-exempt interest and excess of capital gains over capital losses are for net incomes above \$5,000. The 1938 population of 130,061,000 and national income of 70,096 million dollars were used in the computation of the unadjusted tax base.

## (FIGURES IN MILLIONS OF DOLLARS.)

1938 tax base as computed .....	7,018
Less: Tax exempt interest.....	275
Add: Excess of statutory net capital gain over statutory net capital losses .....	246
Adjusted tax base .....	3,989
Estimate of normal tax revenue.....	230
Actual normal tax revenue .....	232
Actual surtax revenue .....	255
Alternative tax revenue .....	277

## NORMAL TAX REVENUE FOR 1939

The alternative tax continued to apply to 1939 incomes. Information on capital gains and losses and revenue from normal tax, surtax and alternative tax was contained in a press release from the Treasury Department dated April 4, 1941, concerning 1939 income tax returns. Tax-exempt interest was estimated from the 51 million dollars of partially tax-exempt interest received in 1939, and the wholly and partially tax-exempt interest received in previous years. Population in 1939 was 130,865,000, national income was 70,096 million dollars.

## (FIGURES IN MILLIONS OF DOLLARS.)

1939 tax base as computed .....	7,677
Less: Tax exempt interest .....	300
Add: Excess of statutory net capital gains over statutory net capital losses .....	120
Adjusted tax base .....	7,497
Estimate of normal tax revenue.....	300
Actual normal tax revenue .....	275
Actual surtax revenue .....	294
Alternative tax revenue .....	306

The 1938 and 1939 comparisons show only that the computed results are of the correct order of magnitude. For the other years, the comparison shows that estimates by this procedure tend to be in error by about 5 percent to 10 percent. Exemptions were reduced on 1940 incomes. The tax base calculated with these exemptions, population of 131,669,000 and national income of 74,294 million dollars is 9,464 million dollars. The writer has been unable to obtain data for a comparison with actual revenue for that year.