

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Studies in Income and Wealth

Volume Author/Editor: Conference on Research in Income and Wealth

Volume Publisher: NBER

Volume ISBN: 0-870-14165-1

Volume URL: <http://www.nber.org/books/unkn47-1>

Publication Date: 1947

Chapter Title: Resource Distribution Patterns and the Classification of Families

Chapter Author: William Vickrey

Chapter URL: <http://www.nber.org/chapters/c5688>

Chapter pages in book: (p. 266 - 297)

RESOURCE DISTRIBUTION PATTERNS AND THE CLASSIFICATION OF FAMILIES

WILLIAM VICKREY

IN ALL THE VOLUMINOUS DISCUSSIONS and statistics on how the nation's resources are distributed among its citizens, far too little attention has been paid to the basis on which various groups of the population are classified. Consequently, much of the statistical material is poorly adapted to the purposes for which it has been produced and used, and many of the conclusions that have been drawn are without solid foundation, if not actually erroneous. The object of this paper is to investigate the effect of various methods of classification on the distribution of income and on the conclusions to be drawn concerning tax burdens, consumption patterns, and the propensity to consume.

1 THE REPORTING UNIT AND THE CLASSIFICATION BASIS

The basis of classification and the unit to be studied are separate questions. One may choose as a unit the family, the household, the individual, or the residents of a structure; the chief basis for the choice is ordinarily the ease with which the affairs of one unit can be disentangled from those of another. Provided the methods of classification are suitable, the results should not be greatly affected unless the unit is so large that the dispersion is substantially reduced by averaging within the unit. But too frequently some aggregate attribute of the unit, such as its income or wealth, becomes the basis for classification and no adjustment is made for the size of the unit or its characteristics; when this is done, the choice of a unit may incidentally involve a considerable difference in the method of classification and hence materially affect the final results.

However chosen, the unit should be classified according to some property relevant to the conclusions to be drawn. If such a property is not susceptible of direct measurement, it is necessary to select some readily available statistic that will correspond closely to the desired property. For example, if the fundamental purpose of a tabulation is to find out how many persons are at various levels of economic welfare, we can take income or expenditure levels as an indicator though we may not be able to measure welfare or even agree precisely on its meaning.

In practice, almost all the figures on the distribution of income and expenditure for the entire population are by classifications derived more by following the line of least resistance than by formulating a base pertinent to the purpose at hand. An aggregate of some quantity for the reporting unit is usually taken for the classification parameter with no adjustment for the relative size or importance of the unit. In *Statistics of Income*, returns are classified primarily by net income per return, a classification that corresponds neither to the economic welfare level of the taxpayer nor to the bracket in which his income will be taxed. In the studies of the National Resources Committee for 1935-36 the unit is logically enough the 'consumer unit' or the family household, but a consumer unit is classified according to its total income, regardless whether it consists of a family of seven or only of a single unattached individual.¹ Accordingly, the statement that the 'lowest third' of the consumer units receive 10 percent of total income does not mean much, for this lowest third includes single unattached persons with incomes of \$750, but excludes large families with incomes of \$800, who will in general be much worse off. To be sure, *Statistics of Income* classifies returns by family status, and some adjustment can be made to allow for differences between returns representing different numbers of individuals and entitled to different personal exemptions. But the adjustment is at best tedious and approximate, and would be more adequate if made by a proper classification in the first instance. The present classification is entirely unrelated to any of the many purposes to which the figures might be put: the most that can be said for it is that it

¹ *Consumer Incomes in the United States* (National Resources Committee, 1938); *Consumer Expenditures in the United States* (1939); *Family Expenditures in the United States* (1941).

preserves a certain degree of formal continuity from year to year. Again, the National Resources Committee studies have some tables with distributions by family size. But this is done for only a few data, and unless the user is prepared to undertake the monumental work of either treating each family size separately or recombining the figures in some way, he must accept data in which figures for a family of two with an income of \$1,612 spending \$429 for food are combined with families of seven or more having an income of \$1,624 but spending \$721 for food. By combining families at widely different welfare levels and having different spending patterns, merely because their aggregate income is the same, the differences in the spending patterns at different welfare levels are partly glossed over.

The possibilities of correcting for this combination of families of dissimilar habits and welfare levels in the same income groups are still fewer in the case of the 1941 consumer income and expenditure studies.² The size of the sample precluded tabulating different family sizes separately; and only family units and single consumers are segregated. Some improvement is possible through recombining single persons with families having, say, 2.5 times the income of single persons, but, as we shall see later, this procedure eliminates only a small part of the total bias arising from the method of classification.

Again, if an individual wishes to know where he stands in relation to the rest of the population, present tabulations give him no real answer. If A, who is a member of a family of two with an income of \$2,000, consults the tables, he may find, for example, that 53 percent of the families have incomes of more than \$2,000. But B, who is a member of a family of six with an income of \$2,000, will come to the conclusion that he also is at the 53d percentile of the population, though he is obviously not nearly so well off as A. While this difference may be considered minor if the extra members of B's family are small children, the difference is striking if these other members are themselves wage earners.

2 ALLOWING FOR SIZE OF FAMILY

The desirability of some allowance for the size of the family has

² *Income and Spending and Saving of City Families in Wartime* (Bureau of Labor Statistics, Bul. 724, Sept. 1942); *Rural Family Spending and Saving in Wartime* (Department of Agriculture, Misc. Publication 520, June 1943).

long been recognized, but it has been difficult to decide upon a formula. Merely putting the figures on a per capita basis will not do, for individuals, particularly children, vary widely in their needs. A partial remedy has been sought by setting up for each member of the family a weighting factor reflecting his consumption needs relative to those of an adult gainfully employed male; by adding these weights for the various members of the family, a rating of the family's needs in terms of adult male maintenance units, 'ammains', can be obtained.

The difficulty, of course, is in agreeing upon a schedule of weights. Possibilities of deriving such weights from objective data are limited, and it seems almost inevitable that the coefficients should rest on some *a priori* notions of the relative needs of individuals of different ages, sexes, and occupations. To be sure, attempts have been made to compute the coefficients on the assumption that families spending a given fraction of their budget for the basic necessities such as food are on the same level of welfare. To be workable, this method requires that the proportion spent on the less essential categories increase uniformly as the level of welfare rises. On this assumption, one could plot this percentage against total outlay separately for each family composition, and a comparison of the total outlay at which a given percentage goes to necessities for the various types of family would yield a clue to relative needs. The difficulty is that it is impossible to draw a sharp line between necessities and luxuries, and the results will depend upon where the line is drawn. For example, if the proportion of outlay for food alone were taken as the index of welfare, the results would differ from those which would be obtained if rent were included among 'necessities', for it seems logical to assume that a large family will naturally spend a bigger proportion of its budget for food and less for rent than a small family, even at the same level of welfare. Again, the relative shares of the family members in the family resources may vary considerably from one welfare level to another, so that a coefficient appropriate at one level might not be appropriate at another; thus a single set of coefficients would probably be inadequate to give the complete picture.

Attempts have also been made to compute coefficients by setting up budgets designed to provide a given standard of

health. This approach is most applicable to food: the cost of achieving certain dietary standards can be ascertained and used as a basis. However, this method is applicable only to a small part of the total budget, and in any case must be qualified by the observation that in practice families do not feed themselves scientifically but in accordance with many prejudices and customs. These can be taken into account in setting up the hypothetical budgets, but the results are likely to be correspondingly less precise.

Some expenditures are fairly clearly for the benefit of individual members of the family. One example is clothing, and it may be possible to set up schedules of relative clothing needs by actually observing the amount spent on the clothing worn by the various members of the family. But even here, where there is a substantial amount of handing down and remodeling, this method may have to rely to a considerable extent on arbitrary allocations of the cost of clothing worn by more than one person.

For a large part of family expenditure, however, there is no ready method of apportionment among the family members, especially of rent and household operation items. It appears therefore, that the weights assigned the various members must remain in considerable measure a matter of subjective appraisal.³ But the fact that subjective appraisal is involved in making an allowance for family size is no excuse for making no allowance at all under the pretext of preserving a spurious objectivity. Any allowance, no matter how arbitrary, is preferable to a patent absurdity, if the allowance is even remotely reasonable.

One notable attempt to classify families by economic welfare level was the 1934-36 'Study of Money Disbursements of Wage Earners and Clerical Workers'.⁴ The families were classified according to 'annual unit expenditure'. Separate family size factors were set up for food, for clothing, and for all other expenditures. Scales of relative consumption needs for the first two items were based on standard budgets, but for other ex-

³ For a discussion of consumption scales as a measure of size of family see Robert Morse Woodbury, 'Economic Consumption Scales and their Uses', 39 *Journal of the American Statistical Association*, 455 (Dec. 1944).

⁴ Bureau of Labor Statistics, Bul. 638, pp. 362-6, 56-65, and various tables.

penditures all persons were treated as equal units. The final number of consumption units in the family was an harmonic mean of the three measures, weighted by the actual expenditure of the family for the three types of consumption.

Unfortunately no such procedure has ever been applied to a complete sample. Failure to apply this procedure or an improvement of it to subsequent studies is probably in part due to the fact that it was fairly complex: it was somewhat difficult for persons accustomed to thinking in terms of family income classifications to grasp the significance of the figures. These fundamentally more meaningful figures might have been more widely accepted had the classification been simpler, and had greater prominence been given to the average family incomes and average family sizes of the families classified in a given unit expenditure group.

Nor does the complexity of the method used for determining family size seem to be justified by any superiority of the results: the procedure adopted implies that two families of identical composition may differ in the number of consumption units merely because they divide their consumption differently among food, clothing, and other items; e.g., if one family does its own baking using purchased fuel instead of buying bakery products, it would in general be considered to contain more consumption units. Since the family size obtained by this method depends upon the distribution of expenditure within the family, it cannot be ascertained merely from figures on the composition of the family by age, sex, and occupation. It is thus difficult for the average person to appraise the number of consumer units represented by his own family, and also to compare the figures so gathered with figures obtained from data that do not admit of such a complicated method of appraising family size.

The assumption that all family members shared equally in expenditures other than for food and clothing is particularly open to question, but can well be accepted on the grounds of simplicity and in the absence of any objective alternative. Even here, however, a set of factors, no matter how uncertain, would have been preferable. It does not seem likely, for instance, that outlays other than for food and clothing for a family consisting of husband, wife, and four children would be double those of a

family consisting of husband, wife, and one child, at the same welfare level. While considerable subjective judgment might be involved in setting up factors for such expenditures, such factors would be preferable to an arbitrary assumption that all persons of whatever age count equally.

In any case, it is almost impossible to correct the more comprehensive figures by this partial sample, for it specifically excludes the unemployed, the self-employed, and families having substantial property incomes. As the fluctuations of income experienced by these other groups differ greatly from those experienced by the rather drastically restricted sample, the extension of the results obtained in this sample to the entire population would be entirely unwarranted.

3 INCOME VS. EXPENDITURE AS A BASIS FOR CLASSIFICATION

Except in the 1934-36 wage earner study, the parameter used for classifying the economic units has almost invariably been a variant of income. This is natural enough in statistics derived from an income tax, and even in presenting the distribution of income. But it is at least curious that in all the more inclusive studies of consumer expenditures the classification by income is retained and that in studies purporting to measure the welfare of various economic groups, income is used almost exclusively as a basis for classification.

Classification by income would probably be innocuous enough if only the data permitted classification by income for a fairly long period so that fluctuations could be averaged. But nearly all statistics are for the income of a single year. In fact, it is extremely difficult to get figures covering a longer period. Families move, change in size, break up, form, and so on — all of which require continual adjustments. It is by no means certain how figures covering the income of individual families for a series of years should be processed even if the raw materials could be obtained.⁵

Incomes fluctuate in varying degree from year to year, not only together with national income but also as a result of de-

⁵ The Wisconsin Tax Commission has published *Changes in Income of Identical Taxpayers, 1929-1935* (1939); see also *Analysis of Wisconsin Income*, by Frank Hanna, Joseph Pechman, and Sidney Lerner, a study prepared for the Conference on Research in Income and Wealth.

velopments affecting the individual, such as sickness, unemployment, overtime work, business ventures, gains or losses on the stock exchange, the writing of a best seller, high temporary earning as an actress or athlete, retirement, good or bad crops. Thus the income for any given year may not at all reflect the long run prospects of an individual. If we are interested in actual standards of living, annual expenditure comes much closer to giving us what we want. Even if fundamentally we are interested in the long run average level of income, annual expenditure may be a better indicator of relative rank, for purposes of classification than annual income, for it at least reflects past savings and in some degree also the individual's expectations regarding his future income, as well as his actual current income.

The effect of using income for a single year rather than average income for a period as a basis for classification tends not only to blur differences in expenditure patterns through aggregating items for units at considerably different levels of economic welfare, but also to exaggerate the inequality of the distribution of income.

In effect, there are three sources of variance in annual incomes: general changes in national income, fluctuations in the income of individuals, and differences in the long run average economic status of individuals. A classification by income for a single year eliminates the first, but retains the last two. It will show a greater dispersion of individuals than would an average income for several years. In the top income groups will be a relatively large number of persons whose income is higher than normal, and who must make some provision from this unusual income for the future when their income may be lower. In the bottom income groups will be a relatively large number of persons whose income is only temporarily low, and who will be able to maintain a fairly high standard of living by drawing on their savings.

The distortions produced by using annual income as a basis for classification are moderately important when the distribution of income is considered, and extremely serious when savings and expenditure patterns are considered and an attempt is made to derive a propensity to consume function. The savings of the lower income groups are greatly understated and their consumption overstated by including persons who maintain

a fairly high level of consumption by drawing on savings; conversely, the savings of those at the top of the scale are exaggerated and their consumption understated. Consequently, the usual figures on the concentration of savings greatly overstate the savings of persons at the upper economic levels, and marginal propensity to consume figures are generally too low.

4 THE EXPERIMENTAL TABULATION

In an attempt to give some notion of the magnitude of some of the biases arising from the usual methods of tabulation, 2,147 schedules from the recent Study of Family Spending and Saving in Wartime were retabulated: 925 representing rural nonfarm units surveyed by the Bureau of Human Nutrition and Home Economics and 1,222 representing urban families surveyed by the Bureau of Labor Statistics.⁶ The BLS sample was designed to cover 1 in 20,000 urban families, that of the BHNHE 1 in 10,000 rural nonfarm families; accordingly, in combining the sample figures, the BLS sample was multiplied by 2, so that the combined results represent approximately 1 in 10,000 nonfarm families in the nation. Although in preparing a general distribution of income from the sample, the BLS and the BHNHE varied the weights for the several income groups somewhat, no adjustment for these variations in weightings were made in the present figures. The validity of such variations in the weights for classifications by per capita income and expenditure is at best doubtful and would tend to cancel in the reshuffling. Moreover, the present figures are but approximations at best, since no schedules for farm families were included. Even as adjusted, there is a general feeling that single persons are greatly under-represented in the original sample. The present figures are intended to indicate differences brought about by reclassification; they are not a complete income distribution in themselves.

In setting up a figure representing family size, the following scheme was used. Persons over 20 years of age were counted as an 'equivalent adult' if they worked more than 34 weeks during the year; as 0.9 of an equivalent adult if they worked 12 to 34 weeks, and 0.8 if they worked less than 12 weeks. Persons

⁶ These schedules were made available to the Committee for Economic Development, under whose auspices the retabulation was carried out.

between 16 and 20 were counted as 1 if they worked more than 34 weeks, 0.8 if they worked 12 to 34 weeks, and 0.7 if they worked less than 12 weeks. Children aged 11 to 15 were counted as 0.5; children aged 6 to 10, as 0.4; and children under 6 years old, as 0.3. In addition, for the first child under 15, 0.2 was added to the total as an allowance for the initial expenses involved in setting up a household with accommodations for a child, expenses that in general are not duplicated for additional children. Thus a family consisting of a husband working full time, a wife not gainfully employed, and two children aged 3 and 6 would be assigned a 'size' of 2.7 ($1.0 + 0.8 + 0.3 + 0.4 + 0.2$); a family consisting of a husband and wife, both working full time, and a daughter aged 18 not working would be assigned a 'size' of 2.7 ($1.0 + 1.0 + 0.7$). Though admittedly arbitrary, this scheme is not unreasonable and will probably produce results not greatly different from any system that might be devised from more precise data. Moreover, it is simple enough to be readily applied by an individual to his own status and to be readily understood.

The number of 'equivalent adults' in each family was computed according to the above scheme, and the income and expenditure divided by this figure, to obtain the income and expenditure per equivalent adult. Tables 1 and 2 show the number of schedules, number of equivalent adults, total income, and total expenditure, by income and expenditure per equivalent adult. Tables 3 and 4 show these figures tabulated by family income and by family size.

In some cases a separation of the data into single and family schedules is available when a more detailed distribution by size of family is not. A partial correction may be attempted by adjusting the single data and combining them with the family data in such a way that single persons are combined with the family income group having the same average income per equivalent adult. As a means of ascertaining what the proper relation between single and family groups should be, the average size of families and of single individuals is compared in Table 5.

TABLE 1

Sample Number of Schedules and Number of Equivalent Adults, 1941, by Income and Expenditure per Equivalent Adult

EXPENDITURE PER EQUIVALENT ADULT GROUPS	INCOME PER EQUIVALENT ADULT GROUPS												Total				
	NUMBER OF SCHEDULES																
	Under \$0	0 to 200	200 to 300	300 to 400	400 to 500	500 to 600	600 to 700	700 to 800	800 to 900	900 to 1,000	1,000 to 1,200	1,200 to 1,500		1,500 to 2,000	2,000 to 3,000	3,000 to 5,000	Over 5,000
200-200	* 245	32															219
200-300	35	* 168	54	9	1	3											211
300-400	9	42	* 162	49	7	5											214
400-500	7	7	43	* 152	84	19	6	3	2								323
500-600		1	16	44	* 140	78	25	6	4	2	2						318
600-700	4	2	10	6	66	* 107	96	19	12	17	5						344
700-800		1	4	5	13	54	* 91	66	36	23	7						300
800-900				2	7	18	36	* 99	50	33	9	2					236
900-1,000	2	2	3	2	4	5	18	26	* 64	62	24	5					212
1,000-1,200	2	1	3	2	3	1	11	13	24	* 134	88	19	2				304
1,200-1,500	2			2	2	1	2	2	7	40	* 83	59	14				217
1,500-2,000								2	2	3	46	* 69	47	9			177
2,000-3,000					2	2	2	2	2	2	2	8	* 42	5	2		65
3,000-5,000													2	* 16	4		24
Over 5,000															* 5		5
Total	2	306	254	293	327	290	287	238	200	316	266	162	105	37	11		3,369
		* 669.5	74.6	133.8	14.0	2.0	4.3		.9								745.7
80-200		84.0	* 447.3	150.4	17.8	11.0	14.7	8.8	1.6								686.3
200-300		18.1	112.5	* 459.2	411.9	212.2	42.8										769.0
300-400		15.0	14.7	116.0													837.7
400-500																	
500-600		7.2	1.8	42.0	150.1	* 377.1	207.8	63.2	16.8	8.6	2.0	5.8					875.8
600-700			1.8	18.5	10.2	193.1	* 265.3	255.3	51.0	37.4	45.8	9.5					894.9
700-800			1.0	20.4	11.5	28.1	122.4	* 250.2	171.6	90.9	60.1	15.6					771.8
800-900					11.6	13.3	46.4	92.4	* 249.4	120.6	87.7	21.6	7.0				650.5
900-1,000		1.6			3.4	61.9	11.9	46.1	62.7	* 160.4	143.3	50.8	10.3				497.4
1,000-1,200		3.2	1.6	2.6	4.5	9.2	29.6	34.0	54.5	* 305.2	177.7	37.6	3.6				666.9
1,200-1,500		1.6			4.8		.8	6.6	5.0	73.6	* 205.3	118.4	22.1	10.8			463.5
1,500-2,000				1.6				1.6	1.6	8.0	87.2	* 154.6	100.3	19.0			372.3
2,000-3,000								6.8	3.6	3.6	1.6	13.6	* 83.5	7.4	5.6		123.7
3,000-5,000												1.6	1.6	9.2	51.2		74
Over 5,000														* 38.8	* 7.4		
Total	3.6	800.2	655.9	794.1	774.0	861.8	712.7	759.5	607.7	489.4	729.3	575.1	341.5	207.5	79.6	22.2	8,414.1

* For the division of the principal diagonal between schedules with savings and those with dissavings see my Reply below.

TABLE 2

Total Income and Total Expenditures, 1941, by Income and Expenditure per Equivalent Adult

EXPENDITURE PER EQUIVALENT ADULT GROUPS	INCOME PER EQUIVALENT ADULT GROUPS										TOTAL INCOME (dollars)	Total			
	Under \$0	0 to 200	200 to 300	300 to 400	400 to 500	500 to 600	600 to 700	700 to 800	800 to 900	900 to 1,000			1,000 to 1,500	1,500 to 2,000	2,000 to 3,000
108,261	90,019	17,068	44,682	6,220	1,032	2,860	1,174	860	860	860	860	860	860	860	108,261
182,695	13,967	113,074	162,770	66,161	9,790	7,164	10,776	7,581	1,554	1,554	1,554	1,554	1,554	1,554	182,695
277,877	2,716	29,274	42,912	188,255	113,767	27,245	10,776	7,581	1,554	1,554	1,554	1,554	1,554	1,554	277,877
398,139	2,239	3,810	42,912	188,255	113,767	27,245	10,776	7,581	1,554	1,554	1,554	1,554	1,554	1,554	398,139
505,375	618	618	15,059	70,660	208,819	132,899	46,202	13,727	7,784	2,263	7,344	7,344	7,344	7,344	505,375
621,807	369	414	6,653	4,562	108,843	170,945	190,311	42,376	35,506	49,030	12,798	12,798	12,798	12,798	621,807
611,563	369	414	6,653	4,562	108,843	170,945	190,311	42,376	35,506	49,030	12,798	12,798	12,798	12,798	611,563
575,823	20	20	7,446	5,404	7,950	30,308	69,836	212,298	114,210	95,999	29,152	10,666	10,666	10,666	575,823
490,370	20	20	7,446	5,404	7,950	30,308	69,836	212,298	114,210	95,999	29,152	10,666	10,666	10,666	490,370
744,853	582	409	957	1,950	5,164	7,573	34,177	54,353	150,658	156,255	65,050	17,114	11,872	11,872	744,853
659,679	42	42	542	2,000	523	4,792	22,486	28,679	51,385	333,958	228,009	59,652	34,906	34,906	659,679
712,009	20	20	542	2,000	523	4,792	22,486	28,679	51,385	333,958	228,009	59,652	34,906	34,906	712,009
316,043	20	20	712	840	840	840	5,700	4,000	2,068	26,084	208,603	28,462	40,286	40,286	316,043
207,574	20	20	712	840	840	840	5,700	4,000	2,068	26,084	208,603	28,462	40,286	40,286	207,574
111,455	20	20	712	840	840	840	5,700	4,000	2,068	26,084	208,603	28,462	40,286	40,286	111,455
6,523,523	20	20	712	840	840	840	5,700	4,000	2,068	26,084	208,603	28,462	40,286	40,286	6,523,523
105,420	90,489	13,039	36,875	4,058	579	1,168	1,892	262	262	262	262	262	262	262	105,420
173,494	19,238	111,319	158,545	56,113	6,160	3,857	6,711	3,970	752	752	752	752	752	752	173,494
266,874	5,991	36,208	49,569	184,733	98,802	19,399	6,711	3,970	752	752	752	752	752	752	266,874
376,767	6,592	6,239	49,569	184,733	98,802	19,399	6,711	3,970	752	752	752	752	752	752	376,767
482,095	23,203	1,330	79,936	206,208	116,880	35,716	35,716	9,494	4,990	1,114	3,224	3,224	3,224	3,224	482,095
579,141	4,838	1,256	12,106	6,680	170,583	165,669	165,669	33,884	24,312	29,624	6,309	6,309	6,309	6,309	579,141
577,578	8,800	716	15,674	8,800	21,212	90,458	185,018	129,398	69,168	45,044	12,030	12,030	12,030	12,030	577,578
550,597	10,230	11,360	10,230	10,230	38,783	78,028	78,028	210,040	102,354	75,523	18,389	5,890	5,890	5,890	550,597
470,366	1,548	1,612	3,062	6,657	11,151	43,609	58,988	150,421	136,071	49,168	9,691	9,691	9,691	9,691	470,366
727,292	3,728	3,568	2,815	4,638	9,911	31,748	37,403	58,988	333,396	194,325	41,410	3,754	3,754	3,754	727,292
610,307	2,232	2,584	6,164	6,164	1,095	8,118	6,152	18,602	93,450	271,624	159,223	28,186	15,401	15,401	610,307
689,952	2,232	2,584	6,164	6,164	1,095	8,118	6,152	18,602	93,450	271,624	159,223	28,186	15,401	15,401	689,952
286,646	17,822	17,822	4,408	4,408	4,408	17,822	17,822	8,000	3,436	29,256	189,267	18,697	15,760	15,760	286,646
68,796	4,818	4,818	4,818	4,818	4,818	17,822	17,822	8,000	3,436	29,256	189,267	18,697	15,760	15,760	68,796
184,087	4,818	4,818	4,818	4,818	4,818	17,822	17,822	8,000	3,436	29,256	189,267	18,697	15,760	15,760	184,087
77,033	4,818	4,818	4,818	4,818	4,818	17,822	17,822	8,000	3,436	29,256	189,267	18,697	15,760	15,760	77,033
6,107,569	301,371	301,371	369,232	489,177	453,374	556,509	509,557	429,845	735,583	700,945	504,793	408,561	205,095	133,589	6,107,569

Total

For the division of the principal diagonal between schedules with savings and those with dissavings see my Reply below.

TABLE 3
Sample Number of Schedules and Number of Equivalent Adults, 1941, by Family Income and Size

INCOME PER FAMILY GROUPS	FAMILY SIZE (EQUIVALENT ADULTS) GROUPS										Total
	0-8	9-1.0	1.1-2.0	2.1-2.5	2.6-3.0	3.1-3.5	3.6-4.0	4.1-5.0	5.1-6.0	Over 6.0	
	NUMBER OF SCHEDULES										
\$0-500	98	83	151	38	24	15	9	5	1	424	
500-750	31	86	32	32	25	24	14	24	5	312	
750-1,000	11	48	94	34	49	19	9	16	2	285	
1,000-1,250	10	50	101	54	25	29	13	8	4	294	
1,250-1,500		28	83	49	54	27	23	8	2	274	
1,500-2,000	5	30	125	97	114	50	36	39	5	508	
2,000-2,500	6	16	134	74	10	69	20	25	2	447	
2,500-3,000	3	11	51	54	81	54	17	35	11	323	
3,000-4,000	1	2	58	29	58	33	28	34	11	261	
4,000-5,000	2	2	23	9	26	15	12	12	9	112	
5,000-7,000			13	9	8	13	7	8	8	75	
7,000-10,000			2	4	2	4	2	2	2	18	
10,000-15,000	2		5	1	2	2	10	4	4	25	
Over 15,000					4			2		11	
Total	167	339	926	484	563	354	200	220	68	3,369	
	NUMBER OF EQUIVALENT ADULTS										
\$0-500	78.4	80.9	256.9	89.8	66.3	48.7	34.4	22.6	5.1	683.1	
500-750	24.8	66.8	146.7	75.6	70.2	78.4	53.1	108.2	13.3	664.7	
750-1,000	8.8	46.9	164.5	81.1	133.8	61.5	33.9	72.2	10.4	632.6	
1,000-1,250	8.0	49.2	178.4	126.7	70.3	97.0	49.2	35.2	20.4	634.4	
1,250-1,500		27.6	149.4	115.7	148.3	89.8	86.8	36.2	12.8	666.6	
1,500-2,000	4.0	30.0	225.3	230.4	310.8	165.1	137.4	170.0	26.5	1,345.1	
2,000-2,500	4.8	16.0	246.2	177.4	250.6	255.6	134	110.5	54.0	1,174.2	
2,500-3,000	2.4	11.0	94.7	129.4	225.3	178.7	64.4	155.2	62.8	1,966.1	
3,000-4,000	.8	2.0	109.4	69.5	160.6	109.9	105.9	146.6	60.1	809.9	
4,000-5,000		2.0	43.3	21.5	72.9	49.6	44.5	53.4	49.2	365.6	
5,000-7,000			23.8	22.1	22.2	43.9	26.3	37.2	60.5	280.0	
7,000-10,000			3.8	9.6	5.2	14.0	7.4	12.0	12.2	64.2	
10,000-15,000	1.6		9.4	2.5	5.2	6.8	36.8	18.8	27.0	98.7	
Over 15,000					11.2	8.2		8.2		28.8	
Total	133.6	332.4	1,651.8	1,151.3	1,552.9	1,169.0	755.8	974.3	372.1	8,414.0	

TABLE 4

Sample Total Income and Total Expenditures, 1941, by Family Income and Size

INCOME PER FAMILY GROUPS	FAMILY SIZE (EQUIVALENT ADULTS) GROUPS										Total
	0-8	9-1.0	1.1-2.0	2.1-2.5	2.6-3.0	3.1-3.5	3.6-4.0	4.1-5.0	5.1-6.0	Over 6.0	
80-500	25,990	22,881	46,610	13,230	7,209	4,600	3,622	1,721	482	126,345	
500-750	19,007	42,551	50,362	19,237	15,706	14,607	8,814	15,323	3,446	190,507	
750-1,000	9,441	41,911	81,575	29,285	41,484	16,883	14,822	14,024	1,622	246,353	
1,000-1,250	10,826	56,668	112,117	60,413	28,028	35,025	14,935	9,213	4,237	329,402	
1,250-1,500	38,656	113,370	67,350	74,227	36,971	31,290	11,305	2,700	375,869		
1,500-2,000	9,003	21,300	168,775	106,755	86,503	63,289	68,595	8,609	12,098		
2,000-2,500	13,334	35,771	237,598	104,654	204,279	184,194	43,314	4,982	969,400		
2,500-3,000	8,693	29,164	186,196	148,075	223,540	146,205	46,178	22,615	884,824		
3,000-4,000	3,939	7,736	195,894	100,653	199,131	113,789	97,646	36,679	24,449		
4,000-5,000	9,450	9,450	98,878	39,022	116,095	57,360	52,940	30,314	17,248		
5,000-7,000			73,158	52,781	47,766	71,976	38,566	45,082	51,003		
7,000-10,000			15,870	31,780	17,462	31,994	19,772	46,346	14,272		
10,000-15,000	25,978		119,857	12,315	25,634	20,000	116,836	52,774	42,980		
Over 15,000					71,486		31,080				
Total	126,211	334,404	1,560,084	908,670	1,273,426	802,047	546,354	574,728	206,899	6,523,081	
50-500	40,223	25,422	59,961	17,007	8,272	5,877	3,572	1,787	504	162,625	
500-750	20,972	41,915	54,417	20,358	16,973	17,368	10,898	16,911	3,245	204,410	
750-1,000	7,843	40,994	90,832	31,536	45,209	16,339	7,991	15,170	2,109	260,408	
1,000-1,250	9,812	56,551	113,574	67,893	29,721	33,347	14,998	9,071	4,108	339,075	
1,250-1,500	35,755	113,337	71,607	72,168	38,909	30,942	11,149	2,684	376,551		
1,500-2,000	9,851	45,220	206,185	163,561	189,240	86,687	59,850	68,842	12,880		
2,000-2,500	8,890	28,424	288,627	155,224	202,935	153,998	42,380	56,372	10,330		
2,500-3,000	8,988	25,276	123,863	138,202	204,845	159,999	44,186	95,076	17,848		
3,000-4,000	3,251	5,268	173,199	81,465	102,171	90,505	112,104	38,506	23,922		
4,000-5,000	8,786	8,786	82,460	40,959	107,694	64,082	45,016	39,209	18,628		
5,000-7,000			45,762	37,971	37,002	62,274	37,064	40,268	38,138		
7,000-10,000			6,500	24,930	16,254	30,104	14,692	15,190	10,274		
10,000-15,000	14,096		79,299	4,689	7,810	20,220	91,646	38,676	44,046		
Over 15,000					40,194		28,676				
Total	123,926	313,611	1,438,016	855,402	1,150,050	791,375	488,485	544,310	207,982	6,107,569	

TABLE 5
Average Size of Families, 1941

INCOME PER FAMILY GROUPS	NUMBER OF				AV. NO. OF		RATIO OF FAMILY TO SINGLE
	SCHEDULES		EQUIVALENT ADULTS		EQUIVALENT ADULTS		
	Single	Family	Single	Family	Single	Family	
\$0- 500	181	243	159.3	523.8	.88	2.16	2.45
500- 750	100	212	91.6	573.1	.92	2.70	2.95
750- 1,000	59	226	55.7	576.9	.94	2.55	2.70
1,000- 1,250	60	234	57.2	577.2	.95	2.47	2.59
1,250- 1,500	28	246	27.6	639.0	.99	2.60	2.64
1,500- 2,000	35	473	34.0	1,311.1	.97	2.77	2.86
2,000- 2,500	22	425	20.8	1,153.4	.94	2.71	2.87
2,500- 3,000	14	309	13.4	952.7	.96	3.08	3.22
3,000- 4,000	3	258	2.8	807.1	.93	3.13	3.35
4,000- 5,000	2	110	2.0	363.6	1.0	3.30	3.30
5,000- 7,000		75		280.0		3.73	
7,000-10,000		18		64.2		3.57	
10,000-15,000	2	23	1.6	97.1	.80	4.22	5.28
Over 15,000		11		28.8		2.62	
Total	506	2,863	466.0	7,948.0	.921	2.776	3.014

5 CLASSIFICATION METHODS AND THE DISTRIBUTION OF INCOME

What effect does shifting from one method of classification to another have on the apparent concentration of income? The simplest method of comparing two distributions is probably the Lorenz curve. Tables 6 and 7 show the data in the cumulative percentage form required for Lorenz curves. Table 6 shows the figures that result from classification by per capita income and expenditure. Table 7 shows the figures that result from a classification by family income, and also those that appear when the classification by family is modified by placing single individuals in the income group occupied by families having 2.5 times as much income.

Economic inequality can be expressed in a large variety of ways. In fact, three factors are involved: the method of classification (family income, per capita income, per capita expenditure, family wealth, or some other index of economic status), the economic quantity whose distribution is being studied (income, wealth, expenditure, or some other measure of economic power), and the measure of the population used (the person, the family, the equivalent adult, or some other measure of relative importance of the various economic units).

TABLE 6

Sample Cumulative Percentage Distribution of Schedules, Equivalent Adults, Income, Expenditures, and Savings by Income and Expenditure per Equivalent Adult, 1941

INCOME PER EQUIVALENT ADULT LEVELS	CUMULATIVE PERCENTAGES OF TOTAL ABOVE GIVEN LEVEL				
	NUMBER OF		MONEY		
	Schedules	Equivalent adults	Income	Expenditures	Savings
Negative	100.00	100.00	100.00	100.00	100.00
\$0	99.94	99.96	100.00	99.94	100.96
200	90.86	90.45	98.32	97.74	106.86
300	83.32	82.65	95.79	94.92	108.49
400	74.62	73.21	91.48	89.99	113.38
500	66.46	64.02	86.07	83.95	117.30
600	56.75	53.77	78.78	75.94	120.57
700	48.15	45.30	71.73	68.51	118.95
800	39.63	36.28	63.05	59.40	116.56
900	32.56	29.05	55.15	51.06	115.22
1,000	26.62	23.24	48.09	44.02	107.90
1,200	17.24	14.51	35.85	31.98	92.68
1,500	9.35	7.71	24.15	20.50	77.73
2,000	4.54	3.68	15.53	12.24	63.85
3,000	1.42	1.21	7.78	5.55	40.52
5,000	.33	.26	3.33	2.19	20.13
EXPENDITURE PER EQUIVALENT ADULT LEVELS					
\$0	100.00	100.00	100.00	100.00	100.00
200	91.72	91.14	98.34	98.27	99.32
300	83.68	82.98	95.54	95.43	97.11
400	75.54	73.84	91.28	91.06	94.46
500	65.95	63.89	85.18	84.90	89.32
600	56.52	53.48	77.43	77.00	83.73
700	46.30	42.84	67.90	67.52	73.47
800	37.40	33.67	58.52	58.06	65.28
900	29.80	25.94	49.70	49.05	59.22
1,000	23.51	20.03	42.18	41.35	54.41
1,200	14.48	12.01	30.76	29.44	50.19
1,500	8.04	6.59	20.65	19.45	38.32
2,000	2.79	2.17	9.74	8.97	20.99
3,000	.86	.70	4.89	4.28	13.92
5,000	.15	.09	1.71	1.26	8.28

TABLE 7
 Sample Cumulative Percentage Distribution of
 Schedules, Equivalent Adults, Income, Expenditures, and Savings
 by Family Income Groups, Unadjusted and with Single Person
 Adjustment,^a 1941

FAMILY INCOME LEVEL UNADJ.	CUMULATIVE PERCENTAGES OF TOTAL ABOVE GIVEN LEVEL				
	NUMBER OF		MONEY		
	Schedules	Equivalent adults	Income	Expenditures	Savings
Negative	100.00	100.00	100.00	100.00	100.00
\$0	99.94	99.96	100.00	99.94	100.96
500	87.42	91.89	98.06	97.34	108.73
750	78.25	83.99	95.14	93.99	112.08
1,000	69.69	76.47	91.37	89.73	115.46
1,250	60.97	68.89	86.32	84.18	117.79
1,500	52.84	60.98	80.55	78.01	117.95
2,000	37.71	45.00	66.99	64.08	109.80
2,500	24.49	31.05	51.67	48.18	102.91
3,000	14.90	19.57	38.10	34.21	95.27
4,000	7.15	9.95	24.36	21.09	72.53
5,000	3.83	5.60	16.76	13.60	63.22
7,000	1.60	2.28	10.19	7.98	42.73
10,000	1.07	1.52	7.96	6.05	36.00
15,000	.33	.34	3.41	2.43	17.87
FAMILY INCOME LEVEL ADJ. ^a	NO. OF SCHED- ULES ADJ. ^b				
Negative	100.00	100.00	100.00	100.00	100.00
\$0	99.94	99.94	100.00	99.94	100.96
500	91.32	91.07	98.71	98.22	105.87
750	83.90	83.64	96.59	95.72	109.36
1,000	75.83	75.33	93.31	91.84	115.01
1,250	67.79	67.47	89.08	87.09	118.33
1,500	59.16	58.80	83.53	81.08	119.57
2,000	42.88	42.83	70.18	67.33	112.12
2,500	28.39	28.79	54.94	51.36	107.57
3,000	17.66	18.14	41.11	37.07	100.49
4,000	8.62	9.05	26.54	23.06	77.63
5,000	4.70	5.05	18.41	15.06	67.72
7,000	1.83	1.84	10.65	8.41	43.58
10,000	1.16	1.13	8.10	6.19	36.16
15,000	.38	.39	3.81	4.08	20.73

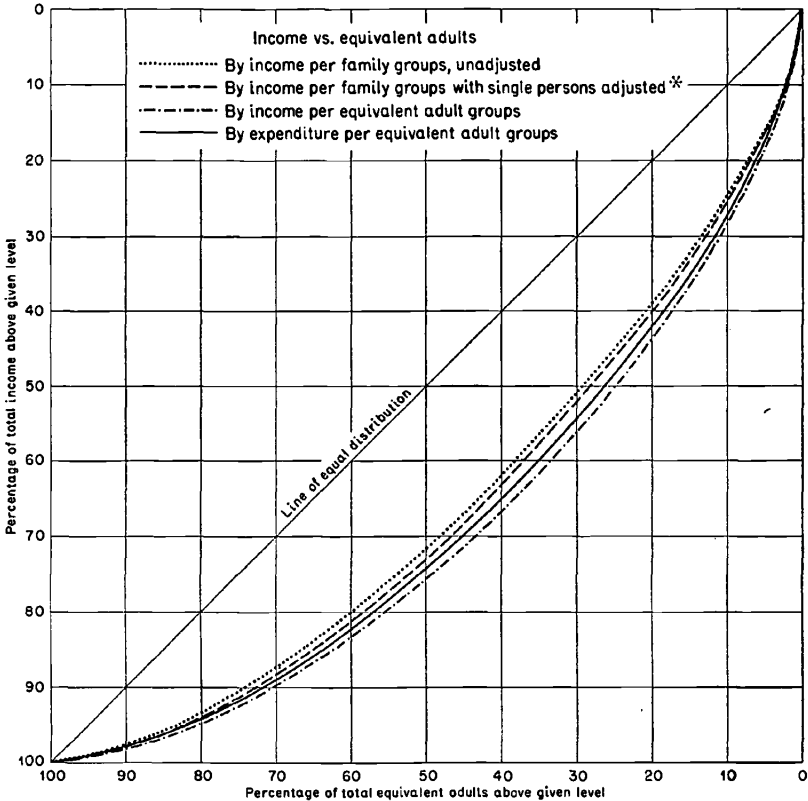
^a Single persons included with families having incomes 2.5 times as great.

^b Each single schedule counted as 0.4.

Chart 1 shows how the method of classification affects the results. The upper curve, showing the least concentration, is the result obtained when family income is the basis of classification — the top 50 percent of the population has 71.2 percent of the income. If an adjustment is made to include single per-

CHART 1
**Effect of the Classification of Families
 on the Distribution of Income**

Lorenz Curves of Income vs. Equivalent Adults; Classified by Income per Family, by Income per Family with Single Persons Shifted Upwards*, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult



* Single persons grouped with families having incomes 2½ times as great.

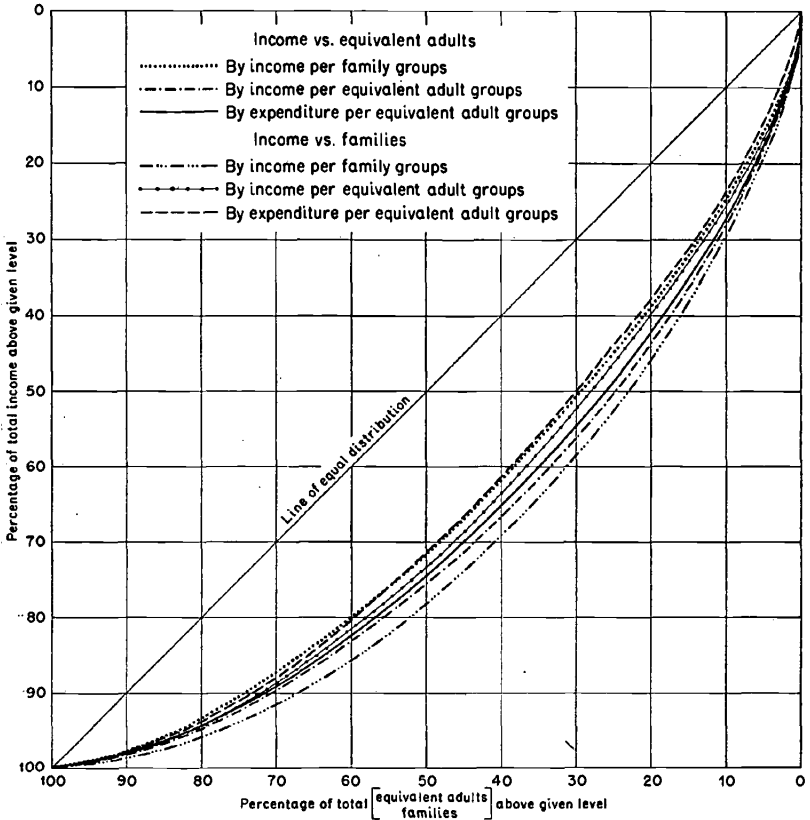
sons in the group with families having 2.5 times as much income, the second curve is obtained — this top 50 percent of the population gets 72.8 percent of the income. If we classify families according to income per equivalent adult, the lowest curve is obtained — this top 50 percent of the population gets 75.6 percent of the income. Finally, if we classify families by expenditure per equivalent adult, the top 50 percent of the equivalent adults get 73.8 percent of the income.

Chart 2 shows how the indicated inequality is affected by the unit chosen to measure the population. The lowest line, indi-

CHART 2

Effect of the Unit by which Population Is Measured on the Distribution of Income

Lorenz Curves of Income vs. Equivalent Adults Compared with Curves of Income vs. Families; Classified by Income per Family, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult

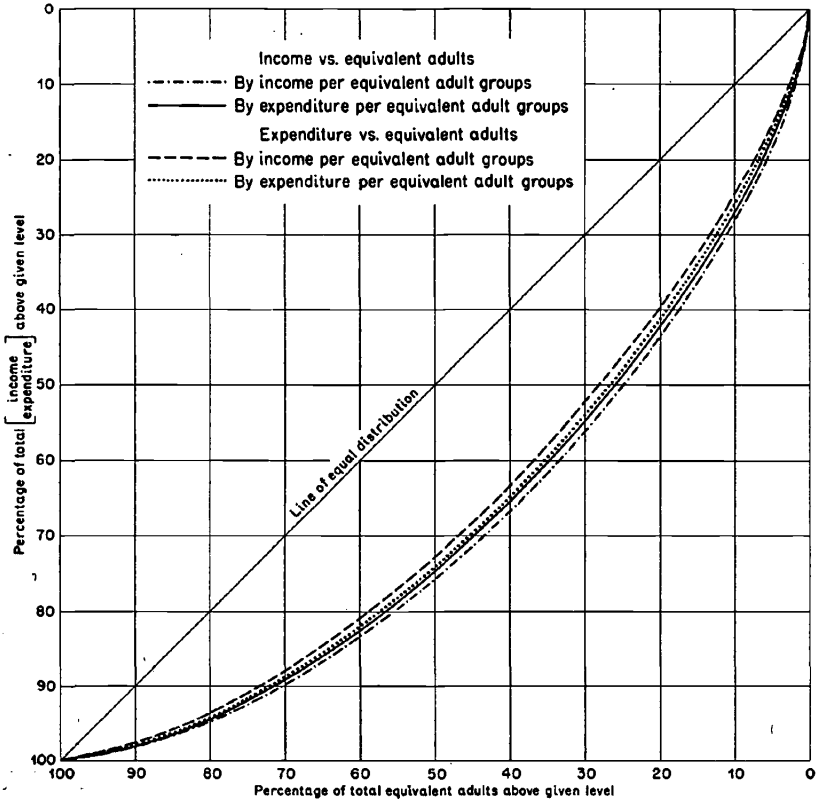


cating the greatest concentration, is the result obtained when income per family is the basis of classification and the percentage of income is plotted against the percentage of families. Using the same classification but plotting income against number of equivalent adults gives a markedly more equal distribution — as indicated by the dotted line. The spread between the income versus equivalent adult curve and the income versus family curve is much narrower for data classified by income per equivalent adult; also in this case it is the income versus equivalent adult curve that indicates the greatest inequality.

Chart 3 shows the difference between using expenditure and income as a basis for classification. The distribution is most unequal when the distribution of income is by income groups, and least unequal when the distribution of expenditure is by income groups. When expenditure groups are used, it makes only a slight difference whether the distribution of income or of expenditure is considered.

CHART 3
Effect of the Unit by which Resources Are Measured
on the Distribution Picture

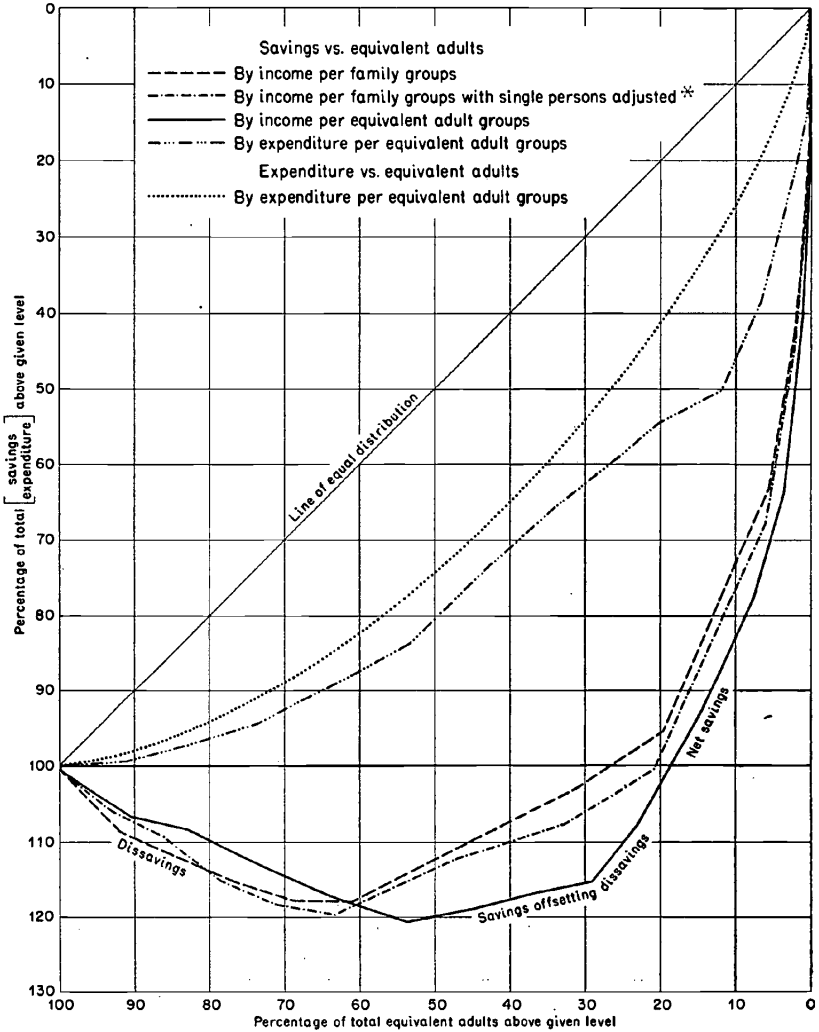
Lorenz Curves of Income vs. Equivalent Adults Compared with Curves of Expenditure vs. Equivalent Adults; Classified by Income per Equivalent Adult and by Expenditure per Equivalent Adult



The most striking effect of methods of classification is found in Chart 4. For comparison, the distribution of expenditure by expenditure per equivalent adult is also shown. When the classi-

CHART 4
**Effect of the Classification of Families
 on the Distribution of Savings**

Lorenz Curves of Savings vs. Equivalent Adults; Classified by Income per Family, by Income per Family with Single Persons Shifted Upwards*, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult; and of Expenditure vs. Equivalent Adults by Expenditure per Equivalent Adult



* Single persons grouped with families having incomes 2 1/2 times as great.

fication is by income, nearly the whole lower half of the population have dissavings or negative savings, and the actual net savings of the country are accounted for by the top 18-27 percent. On the other hand, when the classification is by per capita expenditure, there are no dissavings at the bottom of the scale and the distribution of savings is only moderately more unequal than that of expenditures.

6 CLASSIFICATION METHODS AND THE PROPENSITY TO CONSUME

Such striking differences in the apparent distribution of savings suggest strongly that corresponding differences may occur in the marginal propensity to consume and the marginal propensity to save as computed from these figures. The marginal propensity to consume is defined as the percentage of an increase in disposable income that would be spent by a given income group. The usual method of estimating the marginal propensity to consume at various income levels is to assume that if the members of one income group were to have their disposable incomes increased to the average disposable income of the next higher group, they would on the average increase their expenditures to the present expenditure level of the higher income group. The procedure then is to take the difference between the average expenditure of the successive groups and divide by the corresponding difference between their average disposable incomes.

This procedure clearly is relevant only to a long run propensity to consume: that is, it measures what individuals would do with a permanent increase in disposable income after having adjusted themselves to the change. Or by stretching the relevance a bit, it could indicate the disposition of a temporary increase in income provided we consider not the disposition made in the immediate period but the ultimate disposition of this added economic power over a long enough period.

Obviously, only rarely will a temporary increase in income be spent immediately; most of it will be saved, at least for a brief period. But this saving may not be permanent: much of the larger income may be spent after a shorter or longer interval, and only a relatively small amount retained permanently as

capital. If a suitably long period, probably five years or more, were allowed for determining what is to be done with the added income, the disposal in such a period might be considered to correspond fairly well with the marginal propensity to consume.

However, a classification by annual income is inappropriate for deriving a propensity to consume by this method, for this method presupposes that the average income and expenditure of persons in the various groups is typical of those who are permanently at such a level of income. Actually, as we have seen, the top income groups contain relatively more persons with temporarily large incomes and who accordingly have more savings than persons who receive steady incomes at these levels. Conversely, the lower income groups contain many persons with temporarily impaired incomes who have smaller savings and greater dissavings than persons permanently at these lower income levels. Accordingly, differences in savings corresponding to given differences in incomes are greater than they would be were the various groups to include only persons permanently at the various income levels, and the marginal propensity to save is overestimated and the marginal propensity to consume correspondingly underestimated.

There is on the whole good reason to believe that a marginal propensity to consume derived from a distribution classified by per capita expenditure would be closer to the theoretical long run curve than one derived from an income classification. Annual expenditure is likely to be much more stable from year to year than annual income, and the average savings of a given expenditure group is likely to be much closer to the average savings of families who remain steadily at that average level of income and expenditure than the average savings of the corresponding income group. In other words, there is a high correlation between the annual savings of given families in different years and their annual incomes, and this correlation produces a higher estimate of marginal propensity to save than would a comparison of the average savings of different families at different average income levels.

Table 8 and Chart 5 compare the marginal propensity to consume as estimated from various sources. Though the National Resources Committee data for 1935-36 are practically obsolete and rest on a relatively small sample that must be

TABLE 8

Marginal Propensity to Consume as Derived from Various Tabulations

1935-1936 NRC Family Data

DISPOSABLE INCOME PER FAMILY (1941 \$)	MARGINAL PROPENSITY TO CONSUME	DISPOSABLE INCOME PER FAMILY (1941 \$)	MARGINAL PROPENSITY TO CONSUME
\$452	.775	\$13,930	.549 ^a
758	.859	19,170	.211 ^a
1,007	.888	23,890	.380
1,258	.808	29,440	.356
1,508	.824	37,310	.335
1,758	.827	52,600	.310
2,063	.759	85,350	.215
2,513	.715	159,500	.128
3,104	.666	310,800	.099
3,941	.593	771,200	.074
5,580	.512	(15,570)	.405 ^a)
8,870	.408		

1941 BLS-BHNHE Tabulations

ALL FAMILY UNITS		URBAN FAMILY UNITS	
Disposable income per family	Marginal propensity to consume	Disposable income per family	Marginal propensity to consume
\$790	.868	\$676	.779
1,232	.836	1,111	.980
1,696	.832	1,617	.789
2,276	.954	2,120	1.040
3,239	.732	2,642	.918
		3,384	.750
		4,991	.652
		9,398	.606

Sample Tabulations of Nonfarm Schedules, 1941

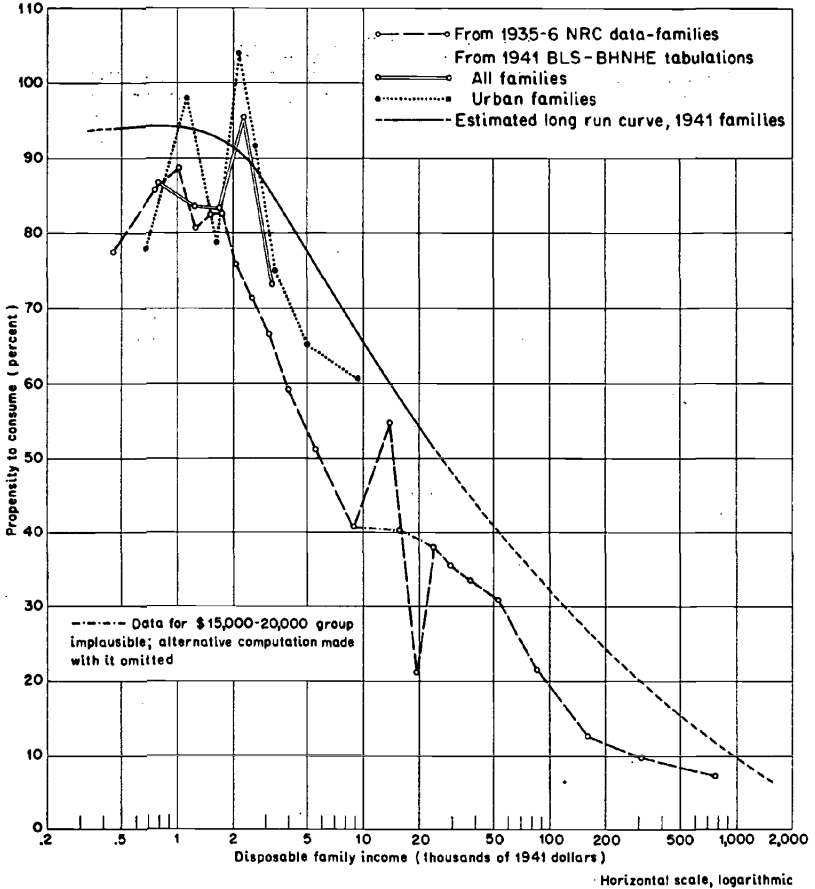
BY FAMILY INCOME GROUPS		BY INCOME PER EQUIVALENT ADULT GROUPS		BY EXPENDITURE PER EQUIVALENT ADULT GROUPS	
Income per schedule	Marginal propensity to consume	Income per schedule	Marginal propensity to consume ^b	Income per schedule	Marginal propensity to consume ^b
\$515	.911	\$587	.930	\$617	.941
919	.944	1,095	.998	1,127	.943
1,492	.830	1,578	.845	1,662	.906
2,095	.983	2,003	.888	2,097	1.035
3,089	.783	2,455	.795	2,487	.937
4,955	.649	3,078	.838	3,359	.799
9,019	.684	4,144	.622	4,442	.931
16,040	.553	6,325	.504	6,756	.852
		13,800	.560	15,470	.619

^a Data for \$15,000-20,000 group implausible; alternative computation made with this group omitted.

^b Computed from differences in income and expenditure per equivalent adult.

CHART 5
Marginal Propensity to Consume

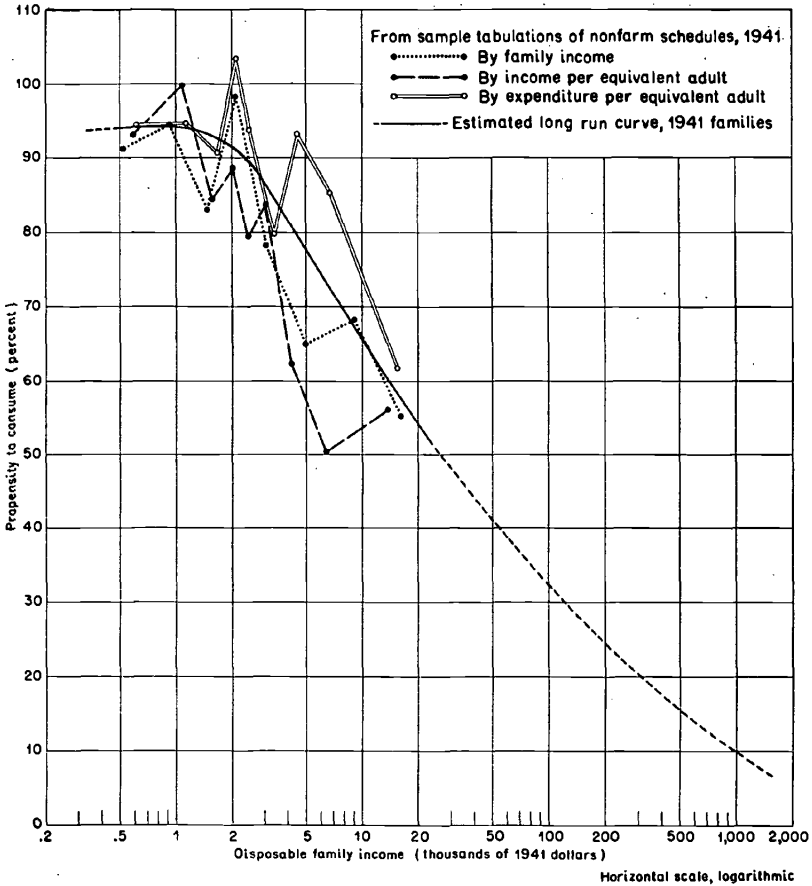
A. From Earlier Tabulations



considered open to wide margins of error, they afford the only estimates in the upper ranges of income. The two estimates from the data for the \$15,000-20,000 group are out of line in a way that strongly suggests a blunder of some sort in the figures. One estimate is derived from the total figures of the 1941 Study of Family Spending and Saving in Wartime and another from those for urban families only, as the urban figures are for higher income groups. Finally, three estimates are shown derived from the sample treated here: as derived from a classification by (1) family incomes, (2) income per equivalent adult, and (3) expenditure per equivalent adult.

CHART 5 (concl.)
Marginal Propensity to Consume

B. From Present Tabulations



The figures in Table 8 are of course not all exactly comparable. In the 1935-36 figures, the disposable income levels have been adjusted upward to correspond to 1941 price levels. In the 1935-36 figures and in the figures derived from the BLS-BHNHE studies for 1941, the propensity to consume is the ratio between changes in consumption and in consumption-plus-savings; personal gifts are not considered on the ground that their ultimate disposition will depend upon the action of the donee. However, the abscissa for plotting purposes is the disposable income including gifts, i.e., net income less personal taxes.

As no figures in the sample tabulations were available for taxes or gifts, they are in effect included in 'savings'. The difference is probably negligible except at the top of the scale; in any case the three propensities computed from these data are comparable in this respect.

In each instance the abscissa against which the marginal propensity is plotted is the geometric mean of the average (disposable) incomes of the two groups between which the marginal propensity to consume was computed.

The curve for an estimated long run marginal propensity to consume is conceptually the result of adjusting the curve obtained from the total figures by family income groups as given by the BLS-BHNHE study for 1941 according to the difference between the figures derived from the family income classification of the present sample and those derived from the classification by per capita expenditures. The figures for urban families in the BLS study and the figures from the 1935-36 study were used as a guide in extrapolating the curve beyond the upper limit of these basic figures. It will be appreciated that this curve is subject to a wide margin of error, particularly in the upper ranges. Indeed, computing a marginal propensity to consume from the detailed figures in Tables 7 and 8 gave such erratic fluctuations that it was necessary to combine the groups in order to produce intelligible results; it thus appears that the basic data are subject to large random fluctuations. And in the upper income ranges the estimated curve is not only based upon doubtful data but also is obtained by rather drastic extrapolation procedures. Nevertheless, the curve is a definite improvement over figures derived solely from data classified by family income.

While it may be fairly clear that a classification by annual expenditure gives a closer approximation to the long run marginal propensity to consume than a classification by annual income, annual expenditure does vary from year to year and so fails to rank individuals accurately according to their long run economic status. We may thus enquire whether there are theoretical grounds for believing that the true long run marginal propensity to consume is higher or lower than the estimates based upon a classification by annual expenditure.

The answer depends fundamentally upon whether variations

from year to year in the savings of given individuals are positively or negatively correlated with variations in expenditures. If savings of given individuals tend to be higher than usual in years of higher expenditures, the average savings in the higher annual expenditure groups will be higher than the savings of persons who have steady expenditures of this amount. Indeed, the average savings of these groups will also be greater than the average savings of persons who have fluctuating expenditures but whose average expenditures equal the average expenditure of the group. Thus whether we take as the hypothetical norm persons having steady expenditures or merely want the average savings for a period of years of persons having given average expenditures, the inequality of the distribution of savings will be exaggerated, and likewise the marginal propensity to save will appear too large and the marginal propensity to consume correspondingly too small. Conversely, if there is a negative correlation between expenditure and savings the propensity to consume will be overestimated.

Fluctuations in annual expenditures per equivalent adult arise from two principal sources: changes in needs and in incomes. When the fluctuations arise from changes in income, it is reasonable to suppose that the change in expenditure will be less, and that accordingly the savings will vary in the same direction as the income and the expenditure. On the other hand, when changes in expenditure arise independently of changes in income, e.g., through expenses arising from illness, retirement, taking a long vacation, providing higher education for children, the purchase of durable consumer goods, moving from one location to another, or equipping a newly established household, savings probably vary inversely with expenditure. Moreover, any change in family need due to changes in the size of family and not reflected in the factor used to measure the size of family will also cause variations in savings to be negatively correlated with expenditure. For example, if we were to classify by family expenditure rather than by per capita expenditure, then within each class one would find varying levels of economic welfare, depending on variations in family size; one would expect to find the higher family expenditure groups relatively overloaded with families that are (temporarily or otherwise) large and that may have relatively low savings (compared to

what would be the case were the families all to remain constant in size), while the lower family expenditure groups would conversely be overloaded with small families having small expenditures by reason of small needs rather than small income and accordingly having unusually large savings. Whether the propensity to consume is over- or underestimated by the use of an expenditure classification will depend on whether changes in consumption are more closely related to such changes in needs as are not reflected in the method of classification or to changes in resources.

On the whole it seems probable that in contemporary circumstances and for a classification that takes family size into consideration changes in income affect expenditures more than changes in other factors influencing consumer needs, and that accordingly savings and expenditures of given individuals in different years are positively rather than negatively correlated, and the marginal propensity to consume obtained from data classified by expenditure per equivalent adult is too low rather than too high. This conclusion, however, rests only on speculation: no data are as yet available that would permit its verification.

While it may be admitted that a classification by consumption per equivalent adult may produce a closer approximation to the long run marginal propensity to consume, if a short run propensity to consume is wanted, the figure produced by using data classified by annual income may be more appropriate. For example, it may be desired to know how much of a given tax increase will come out of savings in the period immediately following its imposition, say a year, rather than in the long run.

However, there is actually nothing in the annual income classification that will ensure this result. What we obtain from this classification is an average of short and long run propensities with unspecified weights given to the propensities for the varying periods, not a short run propensity to save. The various income groups include not only individual families with varying incomes but also families whose income is steady for longer or shorter periods. Thus it cannot be said that the 'propensity to save' figure obtained from such data pertains to a year merely because the basis for classification is the income for one year; nor can it even be said that such a figure pertains to any de-

terminable period at all, as there is no way of telling what the 'average' period of income fluctuation is.

Similar reasoning applies when the problem is to determine the marginal propensity to spend on specific items of consumption. For instance, if it is required to determine what the total expenditure for food is likely to be at a given level and distribution of national income, figures derived from a classification by expenditure groups are likely to yield a more unbiased answer. If, for example, the income is assumed to double, but the price level and the distribution remain the same, judging the consumption of the future \$2,000-3,000 group on the basis of the consumption of the present \$2,000-3,000 group will lead to a biased result, for the future group will contain a larger proportion of temporarily depressed incomes; in fact, if the fluctuation patterns are preserved, it may be expected that the proportion of depressed incomes will be more nearly comparable with that in the present \$1,000-1,500 group. By minimizing the effect of income fluctuations, a classification by expenditure groups should greatly reduce the bias in any such estimates.

7 CLASSIFICATION AND THE DISTRIBUTION OF THE TAX BURDEN

The proper classification of families is also of great importance when we come to estimate the distribution of the tax burden and particularly when an attempt is made to compare the progressivity of types of tax. Actually, if the tax base is closely correlated with the measure used for classification, the progressiveness or regressiveness of the tax may be exaggerated; on the other hand, if the tax base varies in large degree independently of the classification measure, a spurious appearance of regressivity may result. Moreover, these biases do not necessarily depend upon the relation of the basis for classification to the standard of ability to pay adopted as a criterion for progression.

For example, consider a community of six individuals, of which A, B, and C have average incomes of \$4,000 and steady annual expenditures of \$3,600, A having a steady income of \$4,000, B having in the current year an income of \$3,000 and in alternate years an income of \$5,000; while C's income is currently \$5,000 and \$3,000 in alternate years. Similarly, D,

E, and F have average incomes of \$3,000, and annual expenditures of \$2,700, D having a steady \$3,000 income, E \$2,000 in the current year and \$4,000 in alternate years, while F has an income of \$4,000 in the current year and \$2,000 in alternate years. If now we impose a flat 10 percent tax on expenditure, and classify individuals according to whether their current income is above or below \$3,500, then A, C, and F will fall in the top group and pay a tax of \$990 on an expenditure of \$9,900 out of a total income of \$13,000. Measured against expenditure, the tax is of course 10 percent, but measured against income the tax is 7.6 percent. On the other hand B, D, and E will fall in the lower group and pay a \$900 tax on a total expenditure of \$9,000, out of a total income of \$8,000, or 11.2 percent. Thus the burden expressed in terms of the relation of tax to income looks regressive. Actually if we classify the taxpayers on the basis of their average income or expenditure, A, B, and C will be in the top group and pay \$1,080 on an expenditure of \$10,800 out of an income of \$12,000, while D, E, and F will pay a tax of \$810 on an expenditure of \$8,100 out of an income of \$9,000. In both cases the burden is 9 percent of income or 10 percent of expenditures, and the tax is actually proportional. Nor will the consideration of the alternate years correct this bias: for then A, B, and E will be in the bottom group, and the distribution of the tax burden will be the same as in the current year. Thus a classification by annual income exaggerates the regressiveness of sales and expenditure taxes.

On the other hand, if we look at the effect on the apparent progressiveness of the income tax, the reverse is true. If, for example, we have an income tax of 40 percent on income in excess of \$3,500, the top annual income group will pay \$1,000 on income of \$13,000 while the lower group will pay nothing; however, on the average A, B, and C will pay \$800 per year on income amounting to \$12,000, while D, E, and F will pay \$200 per year on income amounting to \$9,000. On an annual basis the relative burdens seem to be 7.7 percent and zero; on the average, they turn out to be 6.7 and 2.2 percent. Thus it is apparent that the relative tax burdens computed from data derived from tabulations classified by annual income must be accepted only with reservations. Unfortunately, no data are available that would permit any close readjustment of tax burden figures.

8 SUMMARY

For the study of the welfare of families, the distribution of the tax burden, propensity to consume, and many other aspects of the distribution of resources and patterns of expenditure, data based on a classification of families by expenditure per equivalent adult are evidently better suited than present classifications by family income, or even than by income per equivalent adult. Even if no close agreement is to be had on the relative weights to be assigned different members of the family, any weighting, no matter how crude, is vastly better than no adjustment for family size. Refusing to make any adjustment merely because no close agreement is to be had recalls the well-known donkey that starved to death through not being able to decide between two bales of hay.

The classification scheme adopted need not be as elaborate as that adopted for the 1934-36 wage earner study; in fact, a simpler scheme is preferable not only to permit simple exposition but also to make comparison possible with other studies in which the data are collected in less detail. It is to be hoped that in any future studies of savings and consumption patterns and size distributions of incomes there will be included in the tabulation program the production of extensive data by expenditure per equivalent adult particularly, and possibly also by income per equivalent adult.

COMMENT

SIMON KUZNETS

These comments on *Savings and the Income Distribution* are an attempt to push the interpretation of the interesting analysis beyond the limits set by the paper itself. Such an attempt may violate canons of legitimate scientific inference, and neglect the cautions, wisely indicated by the authors, as to possible errors in the sample data. But in a field in which empirical analysis has progressed so little, it seems advantageous to advance hypotheses on the basis of inadequate evidence, not as firm conclusions but as guides to further exploration; noting carefully, however, the limitations upon the validity of the hypotheses the data indicate.