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Volume Title: Studies in Income and Wealth

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

Volume Publisher: UMI

Volume ISBN: 0-870-14165-1

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

Publication Date: 1947

Chapter Title: PART IV: Comment

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Chapter URL: http://www.nber.org/chapters/c5689

Chapter pages in book: (p. 297 - 329)

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.

1 MEANING OF THE CHARTS

In both the upper and lower panels of each chart the Y scale is arithmetic for percentages that savings constitute of money income. In the upper panels of the charts, the X scale is in logarithms of dollar money income per family. In the lower panels, with the single exception of Chart 4, the X scale is in logarithms of the difference between the percentile of income and 100. For example, if a given family's income is $7,000, and such income places the family at the 93d percentile in the array, its place on the X axis will be determined by laying off the log of (100 − 93) from a given fixed point on the right side of the chart.[1] If another family's income is $5,000 and it is at the 60th percentile, its position will be determined by the log of (100 − 60); and the segment on the X scale between the two families will be measured by (log of 40 − log of 7).

The stability of the savings pattern for different income populations at a given time or for the same population at different times is derived on the basis of the lower panels. To bring out more clearly the meaning of the lower panel patterns let us assume that in every chart the pattern is a straight line along the whole range. If in every chart the straight lines for the income populations distinguished were identical, i.e., if they coincided at every observed point, what would this identity of lines mean? If they diverged, what would their divergence as to either level or slope signify?

Identity would mean that at the same percentile of income, the percentage of money income saved is exactly the same for the several income population groups, although the dollar levels of the percentile incomes may be quite different from one population group to the next. To use Chart 1 as an illustration, coincidence of the lines in the lower panel would mean that at the 20th or 90th percentile of income, the percentage of money income saved is exactly the same in the family population of metropolises, of large cities, of small cities, etc. In other words, even though the family at the 90th percentile of income in the large cities group may have an income of $7,000, and the family at the 90th percentile of income in the villages may have an

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[1] The fixed point at the right side of the X axis will be not at the log (100 − 100), which is indeterminable, but at the log of some value within the bracket exceeding 0.

income of only $4,000, the proportion of income saved by the latter would equal the proportion of income saved by the former.

If the lines on the lower panels for the several income populations compared fail to coincide, the differences may lie in the level, in the slope, or in both. To take the simpler case first, the straight lines descriptive of the savings pattern for the several income populations may show the same slope but differ in their average level. This would mean that at the same percentile of income, the proportion of money income saved in one income population is higher than the proportion saved in the other populations; and that the absolute difference in the savings ratios is constant through the whole range of the several distributions. There is some indication of that type of relation between the lines on Chart 5 for farm families (between the 50th and 98th percentiles) and on Chart 1 for nonfarm families. With this difference in *level*, similarity or identity of *slope* would mean that the absolute decline in the savings percentage per unit of relative additions to the distance of the percentile position from the peak of the income distribution is the same in the several distributions. The X scale is in logarithms of the difference between 100 and the percentile of income, i.e., in logs of the distance between the percentile position and the peak; and *absolute* additions to these logs represent *relative* additions to the distance of the percentile position from the peak.

Correspondingly, a difference in slope (which may or may not be accompanied by differences in *average* level) would mean a different rate of absolute decline in the percentage of money income saved per unit of relative addition to the distance of the percentile position from the peak. A steeper slope would mean that the absolute decrease in the savings percentage per unit of relative addition to the distance of the percentile position from the peak is greater; in other words, that as the distance in percentile position increases one-tenth (say from the 90th to the 81st percentile or from the 60th to the 54th), the savings ratio drops off more than it does for a similar change in the percentile position in another distribution. With a milder slope there is a smaller falling away in the savings ratios, as we increase the relative distance of the percentile position from the peak.

If we know what a difference in slope means, it is easy to see

what a curved line would mean, since it could be resolved into
a combination of straight lines with slopes changing from one
part of the chart to another. There is, in fact, a tendency of the
slopes to be steeper in the extreme left and right sections of the
lower panels (most clearly shown in Chart 1). This means that
at the very peak of the income distribution, as well as at the
very bottom, equal relative additions to the distance from the
peak seem to cause larger drops in the savings ratio than if
the additions were in the middle sections of the distribution
(between the 40th and 90th–95th percentiles).

What has been said about the meaning of coincidence, or
differences in the level and slope of the lines in the lower panels,
can be repeated about the lines in the upper panels, with one
change: the percentage of money income saved is related to the
logarithm of the dollar level of income, not to that of the dis-
tance of its percentile position from the peak. Coincidence of
the lines for the different populations would mean, then, that
the percentage of money income saved is the same at the same
dollar levels of family incomes. A higher level would mean that
the percentage of income saved, at any given dollar level of
income, is higher; a steeper slope that, per unit of relative
increase in the dollar level of family income, the absolute
additions to the percentage of income saved are greater.

2 RELATION TO GROUP SAVINGS RATIOS

The relation of the savings pattern that appears in either the
lower or the upper panels to the percentage of money income
saved by the whole group whose distribution is studied is of
obvious importance. Does coincidence of the pattern lines for
the several income populations included necessarily mean that
the over-all savings ratios are the same for all income popula-
tions? In terms of Chart 1, were the lines in either the upper or
lower panels to coincide, would it mean that the proportion of
money income saved by all the families in small cities is identical
with the proportion saved by all the families in middle-sized
cities, villages, etc. — the over-all ratio for each group being
the ratio of total savings to total income?

There is no inherent relation between the coincidence of the
lines in either the upper or the lower panels and the equality of

group-savings ratios; and no such relation could be established as long as the X scale is in terms of *ordinal* income values and as long as we deal with distributions as final sums of discrete values.

Let us assume that, in the lower panel, the lines for two income populations coincide. As long as the two lines are treated as sums of discrete, finite sections, rather than as continuous and infinitely divisible paths, there may still be a significant difference between the average level of the line and the group-savings ratio derived as a ratio of all savings to all incomes. This can be illustrated by an example in terms of quartiles rather than percentiles, although the principle is naturally the same. Assume that we have two distributions of four items each, and that the savings ratios for the four items in each distribution, arrayed in order of increasing income, are exactly the same: -20; 0; $+20$; $+40$. The lines for the two distributions in the lower panel will then coincide, regardless what the dollar values are. Now assume that in the first distribution, the relative magnitudes of the four items are such that the second has an income twice that of the lowest; the third, an income twice that of the second; and the fourth, an income twice that of the third. The over-all savings percentage for the first distribution will be $+25.3$. Assume that in the second distribution the ratio between successive pairs of items in the array is 1.5 rather than 2. In that case, the over-all savings percentage will be $+19.7$. The two distributions have different group-savings ratios, yet their savings patterns in the lower panel coincide, point by point.

What is true of the pattern connecting percentages of money income saved with logarithms of differences between percentiles of income and 100 would be true were the X scale in terms of the absolute distance of the percentiles from low to peak; or of logs or dollar amounts of money income. Indeed, the coincidence of savings pattern lines (or identity of their average level) means necessarily identity of the group-savings ratios only under one condition: that the X scale assigns equal space to equal proportions of *total* income, received by sectors of the income population arranged in increasing order of income per unit. For example, if in Chart 1 the X scale were in percentages of total income, with equal distances assigned to the

first 10 percent (i.e., received by the lowest income groups); the next 10 percent, and so on — then the coincidence of the lines, or identity of their average level (the latter average derived for the full range of the X scale from 0 to 100), would necessarily mean identity of the over-all group ratios of savings to income.

In eager search for some function of savings to income that would be stable over time in terms of national aggregates and could thus serve as a basis for policy projections, there has been too ready an identification of savings patterns derived from one or several cross-sections of an income distribution, at a point of time, with a function relating changes of income over time with changes in savings. It is clear from the above that identity of savings patterns within each of several distributions does not mean identity of the savings-income ratios for the several groups compared. It follows that identity of savings patterns within one and the same distribution compared for several points of time does not mean identity of the over-all savings-income ratios for these several points of time; also that the savings-income ratios for the more comprehensive national totals are likely to be fully affected, in their changes over time, not only by the shift in the weights of the component distributions, distinguishable by their group savings-income ratios, but also by possible changes in the group savings-income ratio within each component distribution.

3   CONCLUSIONS SUGGESTED BY THE CHARTS

The following conclusions appear to be suggested by the charts:

As we shift the savings pattern from the relation to logarithms of dollar income to the relation to logarithms of the distance of the percentile from the peak (i.e., 100), there seems to be some convergence in the average level of the lines. In other words, percentages of income saved in the several distributions tend to be more alike at the same percentile points, regardless of differences in the dollar values of the percentiles. This seems to hold for all the charts, but is least prominent for the comparison of farm families in 1935–36 and 1941 (Chart 5).

The significance of this finding has already been indicated by the authors. When the average dollar level of income is low, there is a lower dollar level of expenditures in both the lower

and the higher income brackets; consequently, the units in the higher brackets still save a sizable proportion of their income, even though their incomes are not necessarily at a high dollar level. When the average level of income is high, there is a higher dollar level of expenditures throughout the distribution, in both the lower and upper income brackets; consequently, the units in the lower bracket do not save much, if any, of their income, even though their incomes may be at a fairly high dollar level. We cannot tell whether it is the higher (lower) average level of income that is the cause of the higher (lower) level of expenditures throughout the distribution; whether the causal connection is the other way around; or whether, as it is most realistic to assume in the case of social interrelations, the influences run both ways. Certainly, for rural and metropolitan communities there is a two-way interrelation between lower average levels of income and expenditure.

There are, however, significant exceptions to this convergence of the levels of the savings-income ratio due to the shift of the relation to logarithms of the percentile distance from the peak. First, in the highest percentiles, whose weight in total savings is greatest, such convergence of savings-income ratios is *not* observed. In Charts 1 and 2 the lower panels show marked differences in the levels of the various lines beyond the 95th percentile. It is quite possible that a similar divergence of levels could be observed in the extreme left ranges on the X axis, i.e., at the very low percentile positions. There is some suggestion of it in the lower panels of Charts 3 and 5 (scatter of numbered points). But the coverage of the lower percentile positions is insufficient to test the suggestion.

The divergence of the line levels just noted may reflect the size of family factor or be due to errors of sampling. But unless that were clearly demonstrated, the divergence of the savings pattern levels at the extreme ranges on the X axis in the lower panels means that the interrelation of dollar incomes and expenditures, which makes of each distribution, as it were, a closed economic universe, stops at the very low and at the very high income brackets, whose negative and positive contributions to the total savings pool may be quite heavy.

The three other exceptions — observed in Chart 4 (comparison of 1901 and 1918 with more recent distributions); in

Chart 6 (comparison of savings patterns for Negro and white families), and in Charts 1, 2, and 5 (farm and nonfarm) — are noted and discussed by the authors. They provide other limits for the generalization covering convergence of savings patterns based on the relation to the percentile position. If we add to them the qualification suggested above, and note that the comparison of 1935–36 with 1941 is of limited value because both years were in the rising phase of the business cycle, the generalization as to the convergence of *levels* of savings patterns becomes circumscribed to middle ranges of the income distribution, and to income populations not too much differentiated by time, pattern of life, and race.

Interesting conclusions are suggested by comparing the slopes of the savings pattern lines. The first is that the shift of the line from the relation to logarithms of dollar income to the relation to logarithms of the distance of the percentile position from the peak produces much less convergence of slopes than it does of the average levels. Indeed, in at least one case, the shift results in a greater divergence of slopes (see the New York line on Chart 2). We are at a loss how to interpret this observation.

More significance can be attributed to the differences in slope among the distributions compared in the successive charts. In Charts 1 and 2 the slopes for metropolises are distinctly lower than for smaller communities; and those for villages and small cities are highest of all. In Chart 4, the earlier samples, particularly that for 1901, are marked by much steeper slopes than the later — paralleling, in a sense, the result of the comparison of larger and smaller communities in 1935–36.

Thus, the charts tell us that in smaller communities differences in relative income position have more effect on the savings ratio than in larger communities. This may be due to either of two factors. First, the income differences may be steeper in smaller communities, in the sense that incomes above the 95th percentile (or 75th or any high percentile) are higher compared with incomes below that line than are the incomes above the high percentile level compared with the lower bracket in the large city distributions. Such greater inequality of distribution would lead to a steeper slope of the savings pattern. Second, the relative differences in dollar income at successive

percentile levels may not be greater in smaller communities than in larger; but the opportunities and incentives for raising expenditure levels steeply, in conformity with an increase in income, may be much fewer in smaller than in larger communities. Consequently, a rise in the relative income scale in smaller communities necessarily brings about a steeper rise in the ratio of savings to income. Nor is the other extreme, of low living expenditures, as likely in smaller communities as in larger cities — which would explain the difference in slope at the lower end of the distribution.

There is some suggestion that the slope of the savings pattern is steeper in the very low and very high regions of percentile levels. In Chart 1 this steeper slope can be observed for metropolises and large cities in the movement to the 50th percentile; and in most community sizes beyond the 95th percentile. This is also found in the lower panel of Chart 2; and interestingly enough, also for farm families in Chart 5. In Charts 1 and 2 steeper slopes at the left and right sections are observed also in the upper panels, although not as clearly as in the lower.

The explanation may lie in the effect of the transitory elements on family income status in any distribution based upon income for a single year alone. The presence in the lower brackets of families whose incomes happened to be unduly depressed during the given year would lead to a very low savings-income ratio — these families would not tend to cut consumption to the current year's income. As with a rise in the scale from the very low to the medium brackets the proportion of these temporarily depressed families diminishes, the savings-income ratio may rise rapidly. Likewise, in the very high brackets there may be families enjoying a temporary income advantage; and here also the savings-income ratio will be abnormal — abnormally high. Since the proportion of these transitorily elevated incomes increases as we pass into the very high brackets, the savings-income ratio may rise steeply.

ALICE C. HANSON

Mr. Vickrey's discussion shows considerable ingenuity, but contains some errors in both logic and fact. It also reveals lack of familiarity with the considerable body of thought and literature on the subject of consumption scales as a tool for mean-

ingful classification of families. If he had read carefully Robert
Morse Woodbury's article in the *Journal of the American
Statistical Association* for December 1944, or inspected criti-
cally the BLS 1934–36 'wage earner' family expenditure study
or the various European and other studies that have used the
consumption unit as a basis for classifying families he surely
would not have made a large portion of his remarks.

As a technique for analysis adapted to certain problems, for
certain times and places, a classification of families by income
or expenditure per equivalent adult male is useful. Such a
classification merges into one measure both income (or ex-
penditure) and family size. That very merging, however,
makes such a classification completely unsatisfactory when it
is desirable to look at the two influences separately. As Dorothy
Brady points out, families double and undouble as the general
economic situation changes, and the distribution of consumer
units by size is not independent of income. In comparing two
periods, the combined classification makes it impossible to trace
the effect upon expenditures of real changes in spending habits
separately from changes in the size and composition of consumer
units.

The primary argument for the unit consumption level or unit
expenditure level classification of families hinges upon the
assumption that welfare or roughly equivalent well being
should be the basis for assigning families to the same group.
There are many specific purposes for which income and ex-
penditure data are used, however, especially in market analysis,
where the problem is not one of welfare, but of tracing the
dollars as they flow into the market from the family purse.
The family purse is real and is an understandable concept,
whereas the purse of a statistical 'unit' is anything but clear.

True, family size influences the disposition of the family
dollar. One unambiguous method of tracing its effect is to
present data on expenditures for each of several family types
(husband and wife only; husband, wife, and one child; etc.)
at each income level; e.g., as in the Consumer Purchases Study
and for the main categories of family expenditures in the small
wartime studies made by BLS and BHNHE. This presentation
allows the investigator to develop his own definitions of equiva-
lent welfare for each consumption category — food, clothing,

housing, etc. — from the data on actual family behavior, and
to make such special analyses as he desires without the handi-
caps of specific welfare assumptions which may be irrelevant
to or actually wrong for his purpose.

For the investigator who wishes to summate findings for
several family type-income level groups, an easy conversion
is possible, using any one of several consumption unit scales,
which for most purposes could be quite rough and still give
rather satisfactory results. With a minimum of clerical compu-
tation, the writer, in collaboration with Hans Staehle at the
ILO (ILO Studies and Reports, Series B, 30), used such a
conversion for an analysis of levels of food adequacy.

One of the greatest objections to the consumption unit
analysis is that it is almost impossible to devise an all-purpose
scale. A scale suitable for one purpose, say measurement of
differing needs or requirements as determined by experts, will
differ from a scale measuring varying actual participation in
family consumption by members of differing age and sex. The
former would serve an adequacy analysis, the latter a market
analysis. Also a scale attempting to reflect actual participation
should probably vary at different income levels. For some pur-
poses a scale should be very precise with respect to differing
food requirements or food consumption of persons of different
age and sex but might be very crude with respect to all other
categories of family expenditure. For another purpose as much
precision as possible in all categories should be attained. A
scale that is right for one purpose is bound to be wrong for
certain others. Any scale, either of requirements or of actual
consumption, must be related to some group of people at some
time and place. Hence comparability between studies using
such scales from country to country or from time to time be-
comes difficult.

It seems highly probable that for these reasons as well as
others that could be adduced, a simple per capita measure,
without refinement for age and sex, would serve reasonably
well for many of the welfare purposes and would have the
additional merit of being unambiguous and comparable for
different times and places. If there is sufficient demand for
consumption data classified on a welfare basis, the additional
cost of presenting at least the major categories of expenditure

and savings for families classified by per capita income or per capita expenditure should not be insurmountable.

As for the question whether a more nearly true marginal propensity to save is revealed when families are classified by expenditure than by income, there is no need to rely on speculation on the grounds that data are wanting. They are readily available in the 1934–36 wage earner study. Mr. Vickrey's dismissal of the wage earner study on the grounds that it is a partial sample is not valid when the problem is one of internal classification and examination of relationships. The wage earner sample was as a matter of fact much better for such purposes than the much smaller sample of 1941 upon which his attention chanced to fall. Had the wage earner study included entrepreneurs and others with presumably more variable incomes, the contrasts noted in the two forms of classification would probably only have been accentuated.

The wage earner study reveals as clearly as any more inclusive sample could ever do that a unit expenditure classification tends to put large families at low expenditure levels. At the high expenditure levels are the small families composed of both young people with few or no children and older people drawing upon reserves; also families with unusual large expenses as for a car or refrigerator. A family type analysis would serve at least in part to differentiate these several groups, and for certain purposes there should be a further division by age of family head or of homemaker, since expenditure and savings patterns are certainly different for young and old couples.

The chapter on savings in the summary volume of the wage earner study (BLS *Bul. 638*) compares the effect upon the savings figures of two methods of classification, that by family income level and that by unit consumption level. Charts on pages 169 and 177 of that volume set forth clearly the sharp contrasts in the data resulting from these two methods. Net savings were prominent at high income levels but net deficits were characteristic at high consumption levels. For the 42 cities combined, for example, the percentage of families with net savings increased from 41 to 77 from the lowest to the highest *family income* group, whereas the percentage with net deficits increased from 32 to 74 from the lowest to the highest

unit consumption level.[1] The largest average surpluses were found at the lowest consumption levels, although average incomes were lower and average family size larger than at the high consumption levels. Conversely, the largest average deficits were found at the highest consumption levels. The accompanying text discusses some of the probable reasons, including the one that people's spending is determined not only by current income but also by savings and ability and willingness to borrow.

This method of classification removes the difficulty of interpreting the large deficits incurred by low income families relying on savings. But it complicates the savings pattern at low consumption levels by combining the high savings of small families, especially the older ones having fairly high incomes, with the deficits or small savings of families with small children and moderate or low incomes. The assumption that the same low income families cannot run deficits year after year might, incidentally, bear some careful checking. Mortalities in independent grocery businesses, percentage of doctors' bills never collected, high prices charged by company stores, etc. may all be factors that help to carry low income families who are chronically in debt.

Since saving equals income minus expenditure, at any specified income level, high spending inevitably means low saving out of current income. In a year of changed incomes, if expenditures stay relatively stable, savings must vary from those of the preceding year. It is difficult to see, therefore, that a savings-expenditure relation will be any more 'true' than a savings-income relation. An unstable savings figure related to a stable expenditure figure will undoubtedly give a different answer than an unstable savings figure related to an unstable income figure. In either case, however, the element of instability is still there in the vital figure, namely, savings.

With respect to the 1934–36 wage earner study, Mr. Vickrey states incorrectly that the scales of relative consumption needs for food and for clothing (used to determine the number of equivalent adults) were set up on the basis of standard budgets. The clothing scale was set up on the basis of clothing expendi-

[1] BLS *Bulletin 638*, pp. 170 and 174.

tures of persons of differing age, sex, and occupation as actually found in the study. The food scale was set up on the basis of nutritional requirements tempered by known data on actual food consumption in families of wage earners and clerical workers. This information is clearly set forth in the appendix of every one of the detailed wage earner study volumes (BLS *Bul.* *636*, *637*, and *639–41*). There is particular emphasis in the summary volume (*Bul. 638*) that the scales do not represent ideal or normal budgets but are based upon customary behavior in families where the addition of a child is not as a rule accompanied by any addition to income and the family must adjust its expenditures to meet the new situation.

Mr. Vickrey suggests that failure to use the unit expenditure method in subsequent studies was due to the complexity of the classification procedure; that wider acceptance would have been gained had the classification method been simpler and the average family incomes and average family sizes of the families classified in a given unit expenditure class been emphasized.

The writer agrees that, for many special purposes where the use of scales is desirable, scales more simply arrived at and more readily explainable would be preferable. The degree of refinement warranted varies widely with the problem at hand. Yet, despite his plea for simplicity, Mr. Vickrey proceeds to urge more, not less, complexity in preferring varying factors for the scales for housing and miscellaneous categories rather than the assumption followed in the wage earner study, namely, that participation of all family members in expenditures for goods and services other than food and clothing (i.e., house, car, radio, newspaper, etc.) is roughly equal.

The problem of the complexity of the particular scale used, however, has little to do with the conceptual difficulties of interpreting the results. If one substituted 'per capita' for 'per unit' in the wage earner tables, one would still be troubled by small average sized families composed mainly of adults at high 'per capita' expenditure levels and large average sized families at low expenditure levels. He would still wrestle with the problem of trying to relate an income level to a 'per capita' expenditure level, since average incomes rise at higher expenditure levels. He would still find an association between high spending and low saving.

The suggestion that more prominence might have been given to figures on average income and average family size at each unit expenditure level in the wage earner reports is good. Nevertheless, mere convenient location of the figures would not eliminate the problems in interpretation to which they give rise.

<div align="center">MARGARET G. REID</div>

Mr. Vickrey contends that the usefulness of family income, expenditure, and saving data as indicators of welfare and the propensity to consume is increased by classifying families by expenditures per equivalent adult. No one will deny the need for further exploration of ways of making these data yield additional information nor the earnestness and vigor with which Mr. Vickrey presents his hypothesis and findings. With respect to his own proposals, however, there is nowhere apparent the critical ability he displays in discussing the use of classifications by family income, which are generally recognized as being far from perfect for many of the uses to which they are put.

Classifying families by any measure using per adult equivalent rather than families undifferentiated for size and composition raises quite different issues than classifying by expenditures rather than income. Nevertheless, he does not show the bearing of each of these on propensity to consume. The need for measuring the size of families in terms of equivalent adults exists chiefly, if not solely, when the sample of families is too small to permit their classification by type; whereas the matter of classifying by expenditures rather than income exists no matter what the size of the sample.

The search for a measure of the relative need of families of various size and composition has a long history. Mr. Vickrey touches on this fact briefly. He recognizes that difficulties exist in developing a logical measure, but feels that a simple arbitrary measure is better than none. Some readers may wish to take issue with Mr. Vickrey on the relative values of his scale for various persons; for example, the relatively low scale for unemployed persons 16 to 20. These are likely to be in school and to have needs that are at least no less than those of the same age who are employed. But even more important seems

to be a shortcoming that Mr. Vickrey's scale has in common with many others that have been set up, namely, no allowance is made for the economies of group living. Classification of families whether by per capita or per adult equivalent income or expenditure causes a marked clustering of large families at low income or expenditure and a marked clustering of small families at high income or expenditure levels.

Mr. Vickrey's discussion is lacking in perspective because he fails to discuss the findings of previous investigators bearing on the use of per adult equivalent scales and furthermore to note that the design of the Consumer Purchases Study to permit the classification of families into types taking into account both size and composition was due to the recognized limitations of such measures.

Classification of data by expenditures rather than income was used in many early studies largely because of failure to obtain income data. In many such studies the classification was by family expenditure, not by expenditure per equivalent adult. The most notable analysis using a classification by expenditure per equivalent adult is that of the wage earner study of 1934–36. Mr. Vickrey comments briefly on and expresses general approval of this "one notable attempt to classify families by economic welfare levels". Although he feels that the method used for measuring family size was unnecessarily complex, he speaks of the findings from this study as being "fundamentally more meaningful" than they would have been if the data had been classified by family income. One cannot but wonder whether Mr. Vickrey examined the consumption data in any of the several volumes of this study. Did he realize, for example, that the higher the expenditure per adult equivalent the lower the average savings and the higher the percentage of families having a deficit? For Columbus, for example, from the lowest to the highest expenditure group, average savings dropped from $88 to $13; and the percentage of families having a net deficit, rose from 23 to 38 percent.[1] These figures should cause one to question whether such a classification gives valid results for measuring the marginal propensity to consume or the distribution of families by level of welfare.

[1] Bureau of Labor Statistics, *Bul. 636*, 1940, p. 344.

In the light of these data and data in Mr. Vickrey's paper, it seems worth while here to note a point with respect to the marginal propensity to consume. Mr. Vickrey emphasized that his lowest expenditure group had a net saving. He did not speculate on the fact that this was in part conditioned by the very classification he used. Limiting his lowest group to families with expenditures of less than $200 automatically excludes all those with a deficit exceeding $200. The higher the expenditure the greater the possibility that families will have large deficits.

Mr. Vickrey does not provide facts from the 1941 data he uses on the percentage of families having surpluses and deficits at the various expenditure levels.[2] His analysis is mainly in terms of dollar savings. For nonfarm families in 1941, he found no expenditure groups with a net deficit. Except for the three highest expenditure groups, the percentage that net surplus is of income does not change consecutively with increase in expenditure. Data derived from Mr. Vickrey's tables are given in the accompanying tabulation.

EXPENDITURE PER EQUIVALENT ADULT GROUPS	% SURPLUS IS OF INCOME	EXPENDITURE PER EQUIVALENT ADULT GROUPS	% SURPLUS IS OF INCOME
$0–200	2.6	$900–1,000	4.1
200–300	5.0	1,000–1,200	2.4
300–400	4.0	1,200–1,500	7.5
400–500	5.4	1,500–2,000	10.2
500–600	4.6	2,000–3,000	9.3
600–700	6.9	3,000–5,000	11.3
700–800	5.6	5,000 & over	30.1
800–900	4.4		

Findings of the wage earner and the 1941 data are not compared in Mr. Vickrey's paper. Two differences between the two surveys seem especially important.

The wage earner data are presented by separate cities whereas the 1941 data are for all nonfarm groups in the country as a whole; and the 'nonfarm' group in the 1941 study includes among others families living in the open country who are not farm operators.

The families in the wage earner study were confined to wage earners who had reasonably full employment and to lower salaried clerical workers; hence, the income distribution differs from that of all families, whereas the 1941 sample was designed

[2] Mr. Vickrey supplied the data after his paper had been circulated (Editor).

to provide a cross-section of all incomes. Had Mr. Vickrey had the findings of the analysis of the wage earner data in mind when he planned his analysis, he might have contributed some explanation of why the findings of the two studies, with respect to savings, are different.

Speculations are in order concerning the effect of the difference in samples of these two sets of data on the percentages of income saved by groups of families classified by expenditures per equivalent adult. What might be expected from the 1941 data because of the inclusion of the whole gamut of incomes? If the inclusion of high incomes were the only difference between the two sets of data, one might expect to find, as expenditures rose, a decline and then a rise in average savings, as relatively high expenditure levels are reached. The 1934–36 wage earner data excluded also many low income families. Because of the limitation on deficit imposed by the classification, any average deficit, should it appear at low expenditure levels, would not be large.

Mr. Vickrey's data do not show consistent changes in savings with expenditures per adult equivalent. The blending of the regions and the urban and rural nonfarm groups may account for the failure of a clearcut pattern to emerge. The national nonfarm sample as a whole is a combination of a series of family types, regions, and communities varying in degrees of urbanization. Groups with U-shaped regression lines may overlap so as to give data such as are shown in Table 1.

Some tabulations with families classified by expenditures have been made of the 1941 rural nonfarm families (Table 1). The data for 5 family types classified by expenditure suggest that savings in relation to income have a U-shaped regression. In addition, the cross-tabulations of income and expenditures of families of various types in villages and small cities in 1935–36 in the Consumer Purchases Study suggest that the combination of various groups tends to blur the picture.[3]

In searching for a measure of the family's general level of welfare, Mr. Vickrey rejects annual income, largely because of its tendency to fluctuate from year to year. No one will question the fact that for many families such fluctuations do

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[3] See for example, Department of Agriculture, *Misc. Publication 396*, pp. 358–63.

TABLE 1

Number of Families and the Percentage that Surplus or Deficit is of
Income plus Gifts and Inheritances, Rural Nonfarm Families

Expenditure per family groups	NUMBER OF PERSONS IN FAMILY				
	2				
	Head 60 years or older	Head under 60 years	3	4	5 or 6
	NUMBER OF FAMILIES				
$0– 499	61	24	37	18	15
500– 999	37	32	37	36	38
1,000–1,499	25	43	57	39	46
1,500–1,999	10	26	42	25	30
2,000 & over	7	17	30	31	39
	% THAT SURPLUS OR DEFICIT IS OF INCOME PLUS GIFTS AND INHERITANCES				
$0– 499	4.8	9.6	3.6	—1.6	—0.5
500– 999	3.9	8.8	0.9	11.3	4.9
1,000–1,499	—3.2	3.5	7.4	9.5	2.6
1,500–1,999	—5.1	12.1	9.7	13.0	1.8
2,000 & over	13.0	35.2	11.8	4.9	8.0

occur. He says that he would have been willing to accept average income for a period of years but could not do so since such data do not exist. However, an average for a period of years may be needed for expenditures as well. A family may, for example, fall in a very high expenditure group in any one year because of high medical expense or because furniture or durable types of clothing were bought. Conversely, expenditures in a given year may be low because funds are being set aside for later purchases of such items. Such irregular spending makes annual expenditures a very uncertain measure of a family's general level of living.

In addition, regular spending may not be a suitable measure of the relative welfare level among families. It would, for example, tend to throw into the low expenditure group families living in their own homes. Payments on the house would appear under savings. In such a situation low expenditure would tend to be associated with high savings.

Certain data for the wage earner study of 1934–36 are given with families classified by both 'economic level' (annual expenditure per unit), and family income regardless of the size and composition of families. A striking difference is shown in the ratio of food to housing with a rise in economic level in contrast to an increase in family income. In Chart 1 are shown data for Milwaukee and Columbus with families classified by
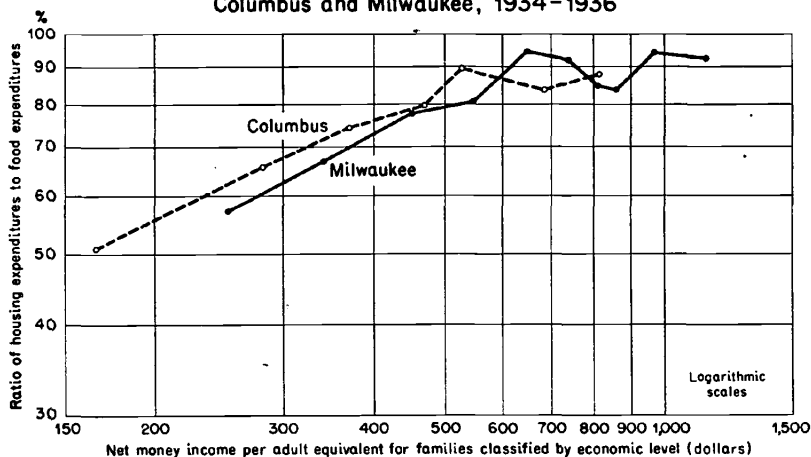
CHART 1

Ratio of Housing Expenditures (incl. Fuel, Light, and Refrigeration)
to Food Expenditures, Wage Earner Families Classified by Family Income
Columbus and Milwaukee, 1934–1936
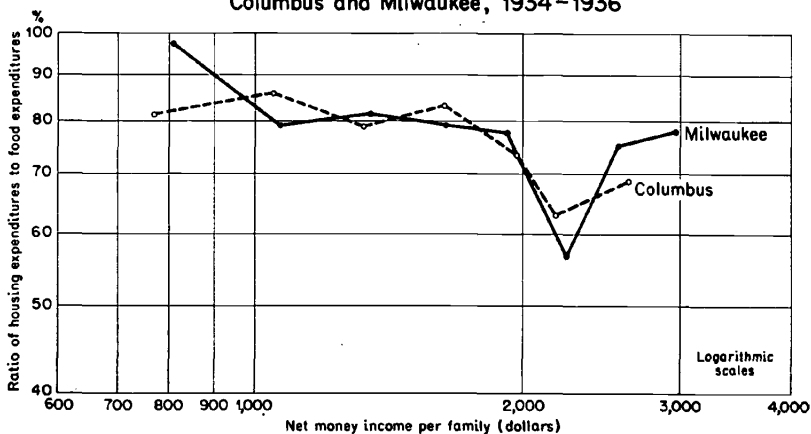
Source: Bureau of Labor Statistics, *Bulletin 636*, 1940, pp. 165, 177, 181, and 187.

net money income; and in Chart 2 are the same families classi-
fied by economic level. In Chart 1 the ratio shows a tendency to
decline, whereas in Chart 2 it shows a marked tendency to
increase. Differences in the distribution of home ownership and
family size are undoubtedly factors causing the slope of these
regressions to differ.

CHART 2

Ratio of Housing Expenditures (incl. Fuel, Light, and Refrigeration)
to Food Expenditures, Wage Earner Families Classified by Economic Level
Columbus and Milwaukee, 1934–1936

Source: Bureau of Labor Statistics, *Bulletin 636*, 1940, pp. 119, 131, 135, and 141.

The data in Charts 1 and 2 and in Table 1 though preliminary provide an adequate basis, however, for concluding that much further investigation is needed of the classifications proposed by Mr. Vickrey.

Perhaps as further analytical work is done, it will be possible to derive something from classifications of families by all or part of their expenditure that will indicate levels of welfare. It also seems probable that measures of equivalent adults may be developed that are really useful. These will need to be tested against data where families are classified by type of family and community.

DOROTHY S. BRADY

Implicit in Mr. Vickrey's discussion is an assumption that should be examined because it is fundamental to much of the present thinking in this field. His entire argument takes for granted that a single measure, such as the distribution of all consumer units by economic level, can serve the multitude of purposes for which such data are used. If this assumption is accepted, then composites that summarize variation with respect to two or more factors must be constructed and the formula used is of considerable importance. If the assumption is not regarded as necessary, attempts to construct and interpret combinations of the variables into one index may be considered interesting and valuable as experiments without serious consequences.

If there is no alternative to the merging of family size and income into one measure, the main lines of Mr. Vickrey's argument cannot be disputed. There is, however, a simple and direct alternative — to tabulate data on income distribution and expenditures by income level and family size. Such tabulations, by and large, allow the analyst to develop and use his own definition of equivalent level of welfare adapted to the purposes of his analysis. In the design of the Consumer Purchases Study, family type was maintained as one of the fundamental controls. The voluminous reports for survey areas published by the Bureau of Labor Statistics and the Bureau of Human Nutrition and Home Economics as well as the National Resources Planning Board present such tabulations by family type in considerable detail. Although the samples for the

1941 survey and the 1944 urban study are small, the income
distribution and the main summary of expenditures for family
size groups have been published. With the analysis of the data
on family size from the Consumer Purchases Study as a back-
ground, the usefulness of these data from small samples can be
maximized.

The direct tabulation of consumption data by the two
variables, income and family size, not only allows for varying
the definition of equivalent economic status according to the
purpose of a given analysis, but also provides the objective bases
for developing the definitions of equivalence. Such tabulations
as the grade of diet by family type and income group and the
characteristics of housing by family size and income group,
both included in the reports of the Consumer Purchases Study,
give the analyst a basis in fact for approaching objectively the
determination of scales defining equal welfare for families of
different sizes.

For many problems the investigator is not necessarily con-
cerned with measures of equivalent welfare. To study, for
example, the probable effects of alterations in the level and
distribution of income on the demand for housing in a given
community, the distribution of consumer units by income and
family size together with the total number of families of each
size provides a much better foundation for analysis than any
composites of the two variables. The distribution of consumer
units by size of family is not independent of the income situ-
ation. Although verification in statistical fact is in many
respects insufficient, it is safe to assume that in periods of low
incomes the consumer unit is larger than in periods of relatively
high incomes. The importance of the changes in the number and
size of consumer units with the income situation has been
recognized by students of housing to the extent that the 1940
Census carried through extensive tabulations of 'subfamilies',
units that, given a more favorable economic situation, might
form separate consumer units. The propensity for the number
of consumer units to increase with improvement in the general
income situation should be considered in connection with
many other problems of interpretation and estimation much
more seriously than it is at present.

Likewise, consumption patterns for many purposes are better

summarized as a two variable relation than through any scheme of combining income and family size into one measure. The potential usefulness of a multivariate analysis was noted in Allen and Bowley, *Variations in Family Expenditures*, and has been stressed on numerous occasions by Milton Friedman and others. It is easy to see in the example of housing demand that estimates based upon the probable number, size, and income of consumer units and the housing consumption of families of each size and income bracket would have more validity than estimates based upon consumption per capita. Any combination of the size of family with income would obscure the differences between two periods where there had been significant changes in income and correspondingly in the size of the consumer unit. Direct tabulation of expenditure data by income and family size would reveal whether expenditures on some item remained the same for the two periods among families of the same size at the same income level, or had changed in some manner. Tabulation by a measure that combines income and family size would reflect the effects of changes in both the consumption pattern and the size of the consumer units. The effect of the changes in 'weights' could not be isolated.

The argument for expenditures as a measure of income was focused on the problem of fluctuations in income. The fluctuations in expenditures and, perhaps more important, the systematic relation between expenditures and age, income held constant, were not sufficiently considered. Family experience is such that even with constant income for a period, expenditures will vary considerably from year to year. The year a baby is born or an operation is performed, a new car or new household equipment is purchased the family may run a deficit. It is apparent from the data tabulated from the Study of Money Disbursements of Wage Earners and Lower Salaried Workers that the classification by expenditures effectively placed in the higher economic brackets two groups of families, small families and those that, in the year, had an 'unusual' expenditure.

Savings fluctuate with expenditures. The association between them may be described as the net effect of the direct correlation with income and the inverse correlation between savings and expenditures for the same income. If certain types

of fluctuation in annual income render it a poor measure of economic level, the annual savings associated with annual income are a poor measure of savings. In the correlation of expenditures and savings of a given year, the 'unusual' situations are concentrated at the lower and upper ends of the expenditure scale.

The negative correlation between expenditures and savings at given levels of expenditure per equivalent adult is so amply illustrated in the reports of the Study of Money Disbursements of Wage Earners and Lower Salaried Clerical Workers that it is unnecessary to resort to speculation on the ground that data are wanting. Careful study of the tables in these volumes leads to the conclusion that the effect of short run fluctuations is not minimized by using expenditures as the classification base.

Expenditures of families change consistently during the life cycle. When all the changes in family experience are considered, the argument that family expenditures in a given year provide a measure of 'average' income is not so clear. To be sure, classification by expenditures avoids problems of interpreting the deficits in the low income groups so far as they are due to the spending of retired persons drawing on savings or of families suffering a temporary loss of income. But another problem of interpretation is substituted: the savings of low 'income' groups due to the inclusion in the lowest brackets of such groups as older couples with a fairly high income, as usually defined. The expenditures of small families, particularly those in older age groups, having fairly high incomes cannot be considered a measure of 'average' income. The effect of the classification by expenditures is accordingly a distortion of the relations sought. The groups for which it is entirely unreasonable to assume that expenditures and average income are identical at any time will be concentrated at both the lower and upper ends of the scale.

The problems of measuring and interpreting income can probably never be solved by such a simple expedient. A much more difficult route must be followed. Data must be collected and analyzed separately for groups likely to differ in income experience and family needs, families at different points in the age cycle; wage and salary families, entrepreneurial and retired

families; families in the different economic zones of the country. The deficits of the lower income brackets do not disappear as a problem through statistical legerdemain. What is needed, and this is mere repetition of the recommendation of the National Resources Committee in *Consumer Expenditures in the United States*, is careful study of these groups. A classification of the low income groups by size of family, age, source of income, and locality provides the analyst with the basis for interpreting the meaning of the deficits of these groups. The families in the low income brackets that go into debt to cover living expenses are not attempting to maintain a high standard of living; they are simply trying to exist. They are not drawing on savings, for they have no savings. Only a few have long run prospects for higher incomes. Such families are still a significant proportion of the 'low income groups', even of the total population. Their expenditures measure level of welfare only in a narrow and callous sense. Security is one important element in human welfare. The presence of an accumulation of debts among families of low incomes is perhaps a more significant index of their unfortunate situation than bad diets and poor housing. Any statistical device that would hide the plight of such groups would ultimately be unfortunate from the viewpoint of the investigator interested in measuring welfare and in understanding how people actually live.

JEROME CORNFIELD

Mr. Vickrey's paper is useful in concentrating attention upon the problems involved in using family budget studies as a basis for estimating certain economic parameters, particularly the marginal propensity to consume. The author's unfamiliarity with previous work on these problems, however, has, I believe, led to the adoption of unsuitable methods and the derivation of incorrect results.

Most early attempts to eliminate the effect of family size on expenditure by use of a single omnibus variable had their formal justification in the following type of argument: (a) expenditure is a joint function of family size and income; (b) since family size and income are correlated, a classification of families by income alone attributes to income an effect on expenditure that

is partly ascribable to family size; (c) a special measure of family size, S, may exist such that we can write $E = SF(S, I)$, where E is expenditure, I is income, and F is a homogeneous function of degree zero; (d) in that case, $\dfrac{E}{S} = F(1, I/S)$, and since $\dfrac{d\,(E/S)}{d\,(I/S)} = \dfrac{dE}{dI}$, when F is a function of this type, classifying families by I/S will give the same information on the net effect of income as a simultaneous classification by income and size.

As data accumulated, it became apparent, however, that the assumption of a homogeneous function of degree zero was incorrect and that the effect of family size could be eliminated only by a simultaneous classification by both income and family size. R. G. D. Allen's analysis of the results of the Consumer Purchases Study, which Mr. Vickrey has apparently overlooked, is one example of this type of analysis.[1]

Even though no work of this type had been done, Mr. Vickrey's own cross-tabulation would supply ample evidence of the inadequacy of this formulation. Were the formulation correct, expenditure per equivalent adult should be a function only of income per equivalent adult and should be unaffected by variations in the number of equivalent adults. The accompanying tabulation, computed from the data in his Tables 3 and 4, shows the relationship between the two variables for two size groups. Expenditure per equivalent adult is con-

AVERAGE INCOME PER EQUIVALENT ADULT	AV. EXPENDITURE PER EQUIVALENT ADULT, FAMILIES WITH:	
	1.1–2.0 EQUIVALENT ADULTS	4.1–5.0 EQUIVALENT ADULTS
$200	$250	$214
300	334	296
400	448	403
500	556	507
600	618	598
700	704	684
800	790	770
900	866	842
1,000	953	902

[1] 'Expenditure Patterns of Families of Different Types' in *Studies in Mathematical Economics and Econometrics* in Memory of Henry Schultz (University of Chicago Press, 1942).

sistently lower for the larger size group at each level of income per equivalent adult. Clearly, the effects of differences in family size have not been held constant by the procedure used.

Though based upon a false assumption, the procedures employed by Mr. Vickrey when he classifies families by income per equivalent adult have at least the virtue of logical consistency. But when he classifies families by expenditure per equivalent adult and applies the same procedures, even this virtue disappears. It is possible to argue without logical inconsistency that even after eliminating the effect of family size, expenditure is a function of past income as well as of current income. It may also be possible to classify families by some index of past income and estimate the effects of past income on expenditure by computing the ratio of the change in expenditure to the change in the index of past income. If one uses expenditure as an index of past income, this procedure will of course yield a 'long term marginal propensity' of unity, which suggests that the index may be of limited value. It is impossible to preserve any measure of logical consistency, however, if one classifies families by an index of past income, then computes the ratio of the change in expenditure to the change in current income. If current income is inappropriate for classification, it is inappropriate for division as well.

Mr. Vickrey can verify the relevance of these remarks by conducting an experiment for a group of families with the same number of equivalent adults. If his procedures work when families differ in size, they should work when family size is constant. If he classifies such a group of families by expenditure, then estimates the 'long term marginal propensity' by computing the ratio of change in expenditure to change in current income he will be surprised to discover, I think, that his marginal propensity exceeds unity.

Mr. Vickrey's preference for expenditure as a basis of classification is based upon the following argument: (a) family budget data are inadequate for measuring the short term effects of changes in income on expenditure, because of the period of adjustment required; (b) because the low income groups contain temporarily depressed and the high income groups temporarily elevated families, income is an unsatisfactory variable for estimating the long term effect as well. The second

objection is relevant only if the first is valid. If family budget studies can provide estimates of the short run marginal propensity, it is desirable to have the estimates reflect the effects of temporarily elevated and temporarily depressed families.

What then are Mr. Vickrey's grounds for believing that family budget data cannot provide an estimate of short run propensities? Mr. Vickrey believes that a long period, "probably five years or more", would be required for a family to adjust its expenditures to a higher or lower standard of living. In other words, any attempt to use the family budget data of one year to estimate expenditures in another year will underestimate expenditure in years of lower income and overestimate it in years of higher income. This second formulation has the virtue of being verifiable. Such a verification has been attempted and the results do not support Mr. Vickrey's thesis.[2] The income-expenditure relation shown by either the 1935-36 studies or the 1941 study seems to explain the variation in consumer expenditures during 1929-41 with a maximum error of 3 percent. Apparently the crude and unsophisticated wants of the poor can be transformed rapidly. They drink as much milk, visit as many doctors, and buy as much clothing as their more fortunate neighbors within a surprisingly short period of receiving higher incomes.

Further work attempting to explain the separate effects of present and of past income on current expenditure is clearly desirable. It will permit us to eliminate the effects of a particular pattern of increasing or decreasing income, imposed by the conditions prevailing at the time of an expenditure study, from our estimates of income-expenditure relationships. It will not, I believe, result in the radical changes in this relationship that Mr. Vickrey's use of expenditure as an independent variable would imply.

REPLY

MR. VICKREY

While I must plead guilty to having criticized current procedures without having adequately investigated the literature and experience with the methods, there is no denying the need

[2] See *Full Employment Patterns, 1950* (Bureau of Labor Statistics, May 1946), Ch. VII.

for better classifications. Practical difficulties or the impossibility of obtaining a basis suitable for all purposes is no excuse for not at least attempting to meet it.

The art of statistics consists in summarizing a great deal of information in a few figures. To present the user of statistics with a series of distributions for different types of families and let him combine them as he sees fit is to leave an important part of the job undone, for it is certain that if a comprehensive distribution is not given, the reader will concoct one for himself, often with very little regard for underlying consistency. If the figures are presented by uniform family income groups, he will almost always follow the line of least resistance and combine them into a classification entirely by family income, rather than go through the elaborate statistical manipulation required to interpolate the various distributions to sets of income levels that would correspond to a reasonable index of family size. Indeed, most such interpolations are extremely approximate, and even if made by elaborate methods, entail some loss of information that could be avoided were the original tabulations by properly proportioned group intervals. By all means, let divisions by type of family be preserved, but if possible the income class intervals should be so chosen as to facilitate combination of the figures for the various family types on a more reasonable basis than family income. For be assured that if the compiler of the statistics does not combine the figures, or at least facilitate their combination on some reasonable basis, the amateur will not hesitate to do so on whatever basis is easiest, reasonable or not.

It is, to be sure, rather disappointing to observe that the reclassification on the particular 'per capita' basis adopted — admittedly more or less arbitrary — fails to bring about as great a degree of uniformity and consistency in the results as had been hoped. Mr. Cornfield's observation that at a given level of income per equivalent adult large families spend a smaller fraction of their income than small families indeed shows that for this scale of family size at least it cannot be assumed that the consumption patterns of large families are merely multiples of the patterns of small families. I freely confess that some such assumption was in my mind when I began the tabulation.

But the falseness of this assumption does not invalidate the per capita classification as a means of obtaining a closer approximation to a measure of what the man in the street thinks of as the distribution of income or its inequality. Moreover, it does not even indicate that the over-all figures classified by income per equivalent adult are necessarily more biased than those classified by income per family: if the question is what the aggregate spending pattern will be if all incomes are increased by a given percentage, for example, a classification in which each group contained proportionate numbers of families of different sizes would give correct results. Only when the proportions of different sized families vary between groups is a bias introduced.

Now the lower family income groups have substantially smaller proportions of large families than the upper income groups, as would be expected: consequently, the income per family distribution definitely has a bias of this sort. Unfortunately, it turns out that the reverse appears to be true, in only slightly less degree, of the classification by income per equivalent adult on the scale selected here: the lower income groups contain bigger proportions of large families. Thus the equivalent adult classification basis has the reverse bias to an almost equal degree.

The consequent bias of the family income classification is bad enough when an estimate is based on the assumption that an increase in incomes will leave family composition unchanged. Actually it seems likely *a priori* that increases in income will lead to establishing new family units, and hence to more and smaller family units. Thus if all the effects of a general increase in incomes are to be allowed for, there should also be allowance for fewer large and more small families. Actually an estimate on a per capita basis will make some adjustment in this direction more or less automatically: increasing the incomes will bring into play spending patterns representing more small families; the family income basis, on the other hand, produces an aggregate expenditure pattern implicitly representing more large families.

Possibly a classification with a smaller weighting for children and supplementary earners would produce a more even distribution of families of various sizes by income per equivalent

adult group, but it would be hard to justify setting up a schedule of weights for family members, or for that matter any coefficient representing family size, merely on the assumption that it would produce such a proportional distribution of families of different sizes.

It would be interesting to use Hans Staehle's technique of minimum difference in consumption patterns to determine the incomes at which families of different compositions are to be considered on the same level of welfare. But there is no guarantee that such a method would yield results that would be within the range of general welfare notions upon which the present scheme was built; much less that the ratios would remain the same at all income levels. And the results might well vary substantially according to the particular items of consumption used.

The fact that the hoped for uniformity is not realized by putting the classification on a per capita basis is no reason for preferring the family basis, but rather leads to new questions to be answered by further investigations. It is indeed one of the advantages of a per capita basis that it brings these additional problems into sharper focus. Why should large families spend less, on a per capita basis, than small? If the family basis is used, the bigger expenditures of large families are dismissed as due to larger needs and no further investigation is prompted. But when the classification is on a per capita basis, the lower expenditures of larger families become a challenge. Is the relation due to overstating the relative needs of dependents? Does it reflect economies of scale enjoyed by larger families? Does it in part reflect a concentration in small families of newly married couples having large outlays for consumer durables, and of older persons who have retired and whose children have left home, and a concentration in larger families of persons at the height of their earning power? Answers to these questions have important implications for both policy and the use of the statistics.

As to the question of income versus expenditure as a basis, data available at present are perhaps inadequate to permit a definitive and objective answer as to which provides a closer approach to the ideal classification. The peculiarities observed in the 1934–36 wage earner study do not, in my opinion, in

the least weaken the case for the use of expenditure. The striking difference between the regression of savings on expenditure found in the 1934–36 study and that found in 1941 is hardly reason for rejecting expenditure; rather it shows how this basis of classification brings into sharper relief differences between different periods and different sectors of the population. Incidentally, the rather peculiar nature of the 1934–36 sample is further illustrated by the fact that the indicated marginal propensity to save, even computed on an income classification basis, declines for the $1,800–3,000 interval. Moreover, the quartile incomes are about $1,150 and $1,820, a ratio of 1.58, while the quartile unit expenditures are about $350 and $630, a ratio of 1.8; ordinarily one would expect the relative dispersion of income to be greater than that of expenditure (BLS *Bulletin 638*, pp. 22, 56, 174). The corresponding interquartile ratios for 1941 are 2.92 for the distribution by family income level, 1.65 when this distribution is adjusted by allowing for single persons as 0.4 of a family, 3.05 when using income per equivalent adult, and 2.44 when using expenditure per equivalent adult, a somewhat more normal relationship. In effect, both the method of selection and the nature of the results of the 1934–36 sample indicate a systematic exclusion of incomes outside a given band, and particularly of families with incomes outside a given per capita income range; within such a slice of the distribution, savings are almost inevitably negatively correlated with per capita expenditure, regardless what a more representative sample might show.

Classifying families by expenditures does not mean that expenditure is taken as a measure of past average incomes, but merely that the rank of each family by current expenditure is considered the same as its rank by average past income. I cannot see how this procedure necessarily tends to produce a long term marginal propensity to consume of unity, as Cornfield suggests, unless this is taken to mean merely that all income is eventually spent in one way or another; in which case gifts and bequests would have to be included in expenditure. The actual figures are substantially and significantly less than unity.

Even if current expenditure were perfectly correlated with an average of past income, the implication would not be that the line of regression has a slope of unity in absolute terms.

Moreover, if current income is considered equal to past average income plus or minus a random variation, and this random variation is uncorrelated with variations in expenditures, then an average of current incomes in a current expenditure group will equal the average past income, but an average of current incomes in a current income group will differ from the average past income. This is the reason for using the expenditure group. The procedure is not to use expenditure as an index of past income, but to use the average current income in an expenditure group as the index of the hypothetical past income. I see no logical inconsistency in this.

As some interest has been shown in dividing families between those with deficits and those with surpluses, a division of the main diagonal of Tables 1 and 2 is appended. The

SUPPLEMENT TO TABLES 1 AND 2

Schedules in Main Diagonal with Expenditures Greater than Income

PER CAPITA INCOME AND EXPENDITURE GROUP	NUMBER OF SCHEDULES	NUMBER OF EQUIVALENT ADULTS	TOTAL INCOME	TOTAL EXPENDITURE
$0– 200	92	269.1	$ 34,132	$ 38,814
200– 300	64	186.3	44,976	48,068
300– 400	54	161.3	51,301	54,476
400– 500	63	157.0	69,594	72,733
500– 600	64	166.6	90,478	93,754
600– 700	57	135.6	85,053	88,810
700– 800	38	76.9	55,665	57,887
800– 900	39	102.3	84,363	87,860
900–1,000	30	71.5	66,116	68,169
1,000–1,200	71	159.2	171,434	178,880
1,200–1,500	30	79.4	99,078	106,912
1,500–2,000	32	73.1	117,402	127,780
2,000–3,000	11	20.9	51,669	54,161
3,000–5,000	5	13.4	42,105	44,304
Over 5,000	. . .	. . .	. . .	. . .
Total	650	1,662.6	1,063,366	1,122,708

division must be considered very approximate, as relatively small changes in the schedule figures would suffice to throw most of these schedules from the surplus to the deficit class, or vice versa.