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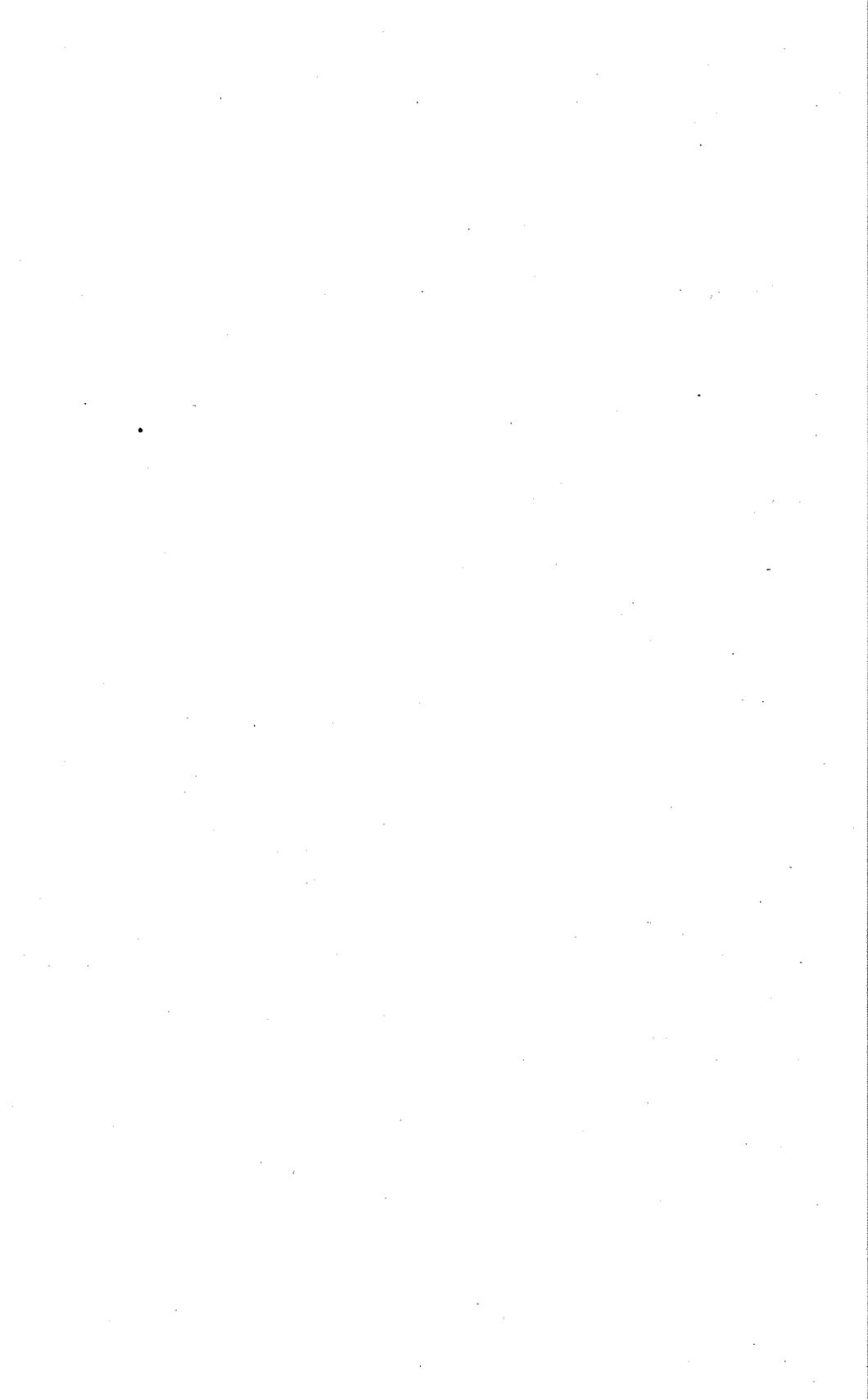
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Part VI

Effect of Income Concept upon Expenditure Curves of Farm Families

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EXPENDITURES OF FARM FAMILIES are less elastic in relation to income than those of nonfarm families. At least, that is what two national surveys, the Consumer Purchases Study (CPS) for 1935-36 and Spending and Saving in Wartime (SSW) for 1941 (Chart 1 and Table 1) and the first quarter of 1942, as well as local surveys found.¹ The marked differences among income-expenditure curves reported for farm families in various regions included in the CPS (Chart 2) are larger than those between farm and nonfarm families in Chart 1. In Chart 2 the families in the C and D groups are relatively low spenders at low income levels and relatively high spenders at very high income levels; the A and B groups have the reverse pattern. These curves may describe real differences between farm and nonfarm families in general and among farm families in various regions, or they may be the result of methodology.

These differences between the expenditure curves of farm and nonfarm families have at times been interpreted as an indication of a lower propensity to consume by farm families due perhaps to a desire to expand the scale of their business.² Such an assumption does not take into account differences in expenditure curves among groups of farm families.

Despite the differences in Chart 1 income-expenditure patterns of farm and nonfarm families are fundamentally similar if the comparison is at the median income of groups of families (Chart 3 and Table 2): the elasticity of expenditures in relation to net money income is 0.92 and 0.98 for farm and nonfarm families respectively.

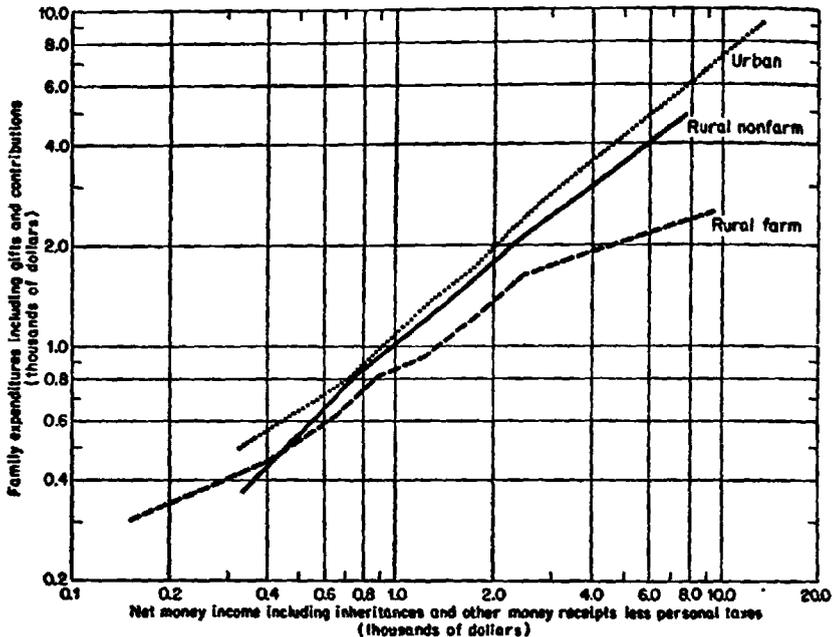
¹ For the national estimates based on the CPS see *Family Expenditures in the United States* (National Resources Planning Board, Washington, 1941). Reports for farm areas and villages and small cities in predominantly farm areas were made by the Department of Agriculture, and those for large and middle-size cities and for small industrial cities by the Department of Labor.

For urban data from the SSW see Department of Labor, *Bulletin 822* (1945), and for rural data, Department of Agriculture, *Miscellaneous Publication 520* (1943). For the local surveys see, e.g., Department of Agriculture, *Miscellaneous Publication 666* (1949).

² It is generally conceded that the business income nonfarm entrepreneurs report consists largely of withdrawals from business, which tend to be highly correlated with consumption outlays. If farm family income were thus defined, income-consumption patterns would probably seldom, if ever, take the form of curve A in Chart 2.

Chart 1

**Average Family Expenditures and Average Net Money Income,
Families of Two or More, 1941**
Expenditures Adjusted to Those for Family of 3.5 Persons



Source: Table 1.

Ratio scales

How can these differences and this similarity be reconciled? This study was undertaken on the hunch that the explanation of the differences among the curves in Charts 1 and 2 lay in the suitability of the income used as a measure of the relative economic rank of the families. Many types of change cause transitory changes in annual income. These may be more important for farm than for nonfarm families and may differ appreciably from one region to another. Furthermore, it is harder to measure the income of farm families, and inaccuracies may introduce a spurious variability into the income figures that affects the classification of farm more than nonfarm families. Variability of income from year to year, whatever the reason, reduces the likelihood that annual income is a suitable indicator of the income that families have in mind when deciding to spend or to save. The more variable the incomes the flatter the expenditure curve tends to be. The reason for the similarity of the income-expenditure patterns of farm and nonfarm families in Chart 3 may, on the other hand, be that at the median income failure to classify families by their economic level has about the same effect on both groups.

Table 1

Expenditures of Urban, Rural Nonfarm, and Rural Farm Families of Two or More Persons, by Net Money Income, 1941

Net Money Income Class	No. of Families*	Persons Per Family	Average	Family Expenditures plus	
			Net Money Income plus Inheritances and Other Money Receipts	Gifts and Contributions As Reported	Adjusted to Family Size: 3.50 Person†
URBAN FAMILIES					
Under \$500	3.67	2.64	\$329	\$472	\$495
500- 1,000	10.96	3.17	736	798	812
1,000- 1,500	13.24	3.05	1,268	1,320	1,350
1,500- 2,000	18.29	3.39	1,759	1,717	1,727
2,000- 2,500	17.00	3.30	2,272	2,214	2,237
2,500- 3,000	13.79	3.70	2,744	2,674	2,650
3,000- 5,000	16.57	3.71	3,702	3,403	3,370
5,000-10,000	4.67	4.43	6,120	5,010	4,947
10,000 & over	1.80	4.62	13,382	9,601	9,169
RURAL NONFARM FAMILIES					
Under \$500	163	3.02	335	360	369
500-1,000	206	3.84	743	815	806
1,000-1,500	200	3.56	1,251	1,220	1,218
1,500-2,000	117	4.01	1,702	1,582	1,547
2,000-3,000	117	3.94	2,381	2,115	2,075
3,000-5,000	49	4.06	3,799	2,947	2,877
5,000 & over	13	3.44	7,782	4,855	4,871
RURAL FARM FAMILIES					
0- \$250	104	3.93	151	328	302
250- 500	135	3.95	407	464	455
500- 750	102	4.11	669	640	628
750-1,000	85	4.16	889	840	816
1,000-1,500	110	4.74	1,227	975	927
1,500-2,000	79	4.39	1,761	1,263	1,217
2,000-3,000	64	3.56	2,450	1,638	1,634
3,000-5,000	28	4.54	3,760	1,954	1,872
5,000 & over	13	4.31	9,412	2,589	2,502

Sources: BLS *Bulletin* 822, Text Table 10 and Appendix Tables 2,19; Department of Agriculture, *Miscellaneous Publication* 520, Table 49; and unpublished data supplied by the Bureau of Human Nutrition and Home Economics.

* Percentage weights only are given for urban families.

† Family expenditures were standardized to 3.5 persons using the ratio of the sixth root of the family sizes, a scale developed by Dorothy S. Brady for urban families. Preliminary investigation indicated that it was suitable also for farm families and it has been used throughout in standardizing family sizes when these varied with income.

Table 2
 Net Money Income and Expenditures at Median Income, Selected Analysis
 Units, CPS, 1935-1936, Family Type I

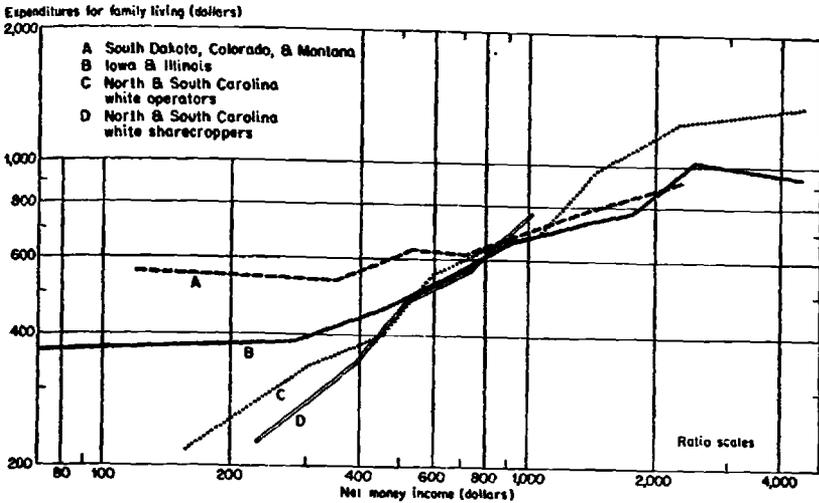
Analysis Unit	Net Money Income	Expenditures for Family Living	Analysis Unit	Net Money Income	Expenditures for Family Living
I Farm Units			II Villages		
Vermont	\$ 550	\$ 510	New England	\$1,285	\$1,325
New Jersey	705	670	Middle Atlantic, North Central	1,020	965
Pennsylvania, Ohio	610	515	Plains, Mountain	1,175	1,175
Michigan,			Pacific	1,150	1,125
Wisconsin	625	580	Southeast		
Illinois, Iowa	605	510	White	1,300	1,240
Kansas, N. Dakota	280	515	Negro	410	420
Colo., Mont., S. D.	470	580	III Small Cities		
Washington,			Middle Atlantic, North Central	1,300	1,265
Oregon	680	550	Plains, Mountain	1,430	1,430
Oregon part time	1,040	910	Pacific	1,565	1,515
California	1,070	1,040	Southeast		
North Carolina			White	1,480	1,460
self-sufficing	185	185	Negro	520	500
N. & S. Carolina					
<i>Operators</i>					
White	550	500			
Negro	345	285			
<i>Sharecroppers</i>					
White	445	395			
Negro	290	250			
Georgia, Mississippi					
<i>Operators</i>					
White	360	340			
Negro	230	190			
<i>Sharecroppers</i>					
White	195	200			
Negro	175	160			

Sources: Department of Agriculture, *Miscellaneous Publications 465*, Tables 44 and 45; *396*, Tables 49 and 50. In these publications families are classified by net total income. The data for net money income and expenditures for family living were plotted, and after freehand smoothing, data were read from the curves at median net total income.

The median income was that of families reporting, no allowance being made for families not eligible or for any bias due to eligible families who did not report. The median income was selected solely for the purpose of getting an income-expenditure relationship where the effect of transitory income was at a minimum. If the income of the group as a whole changed relatively little from the preceding year, the relatively high expenditures of the group that had moved down the income scale and the relatively low expenditures of the group that had moved up would be more likely to cancel at the median income than at any other income position. Hence, among groups the median income position may be most useful for indicating levels of expenditure adjusted to a given income. All groups for which data were reported were included unless at the median income family expenditures had appreciably exceeded net money income. This relation was accepted as conclusive evidence that, on the average, families at the median income had far from a stable pattern. The only sets of data for which this condition was reported were 'Kansas and North Dakota' and 'Colorado, Montana, and South Dakota'. These two groups of states are unique with respect to the low level of farm products (physical volume) in the year of the survey in comparison with that of 1930. Most of the survey data in these

Chart 2

**Expenditures for Family Living and Net Money Income
Farm Families of Husband and Wife Only
4 Analysis Units, CPS, 1935-1936**



Source: Department of Agriculture, *Miscellaneous Publication 465*, Tables 44 and 45. The data were tabulated by net total income; net money income is the average for the net total income classes. All categories with negative net money incomes were omitted. These occurred for all except group D. Expenditures for these classes were relatively high in contrast with lowest categories shown. Combination of classes was made at upper income levels where the number of families is small and the curve irregular.

Other sets of four groups as diverse as these could also be selected from CPS data. Some of the differences among groups may also be due to the eligibility requirements of the CPS. These excluded, for example, all families receiving any relief during the report year, broken families, those who had not been on their present farms for at least a year, those with either a wife or husband foreign born. In areas with a relatively high average income the criteria may have led to the exclusion of most families with typical income under \$500. With such exclusion the low-income category tended to have chiefly families who looked upon their current income as atypical.

The likelihood of eligibility requirements affecting the shape of the expenditure curve is indicated by data in Department of Agriculture, *Miscellaneous Publication 465*, pp. 336-8. The percentage of total farm families eligible for the 'consumption' study for the analysis units shown in Chart 1 was A, 29 percent; B, 59 percent; C and D, 39 percent.

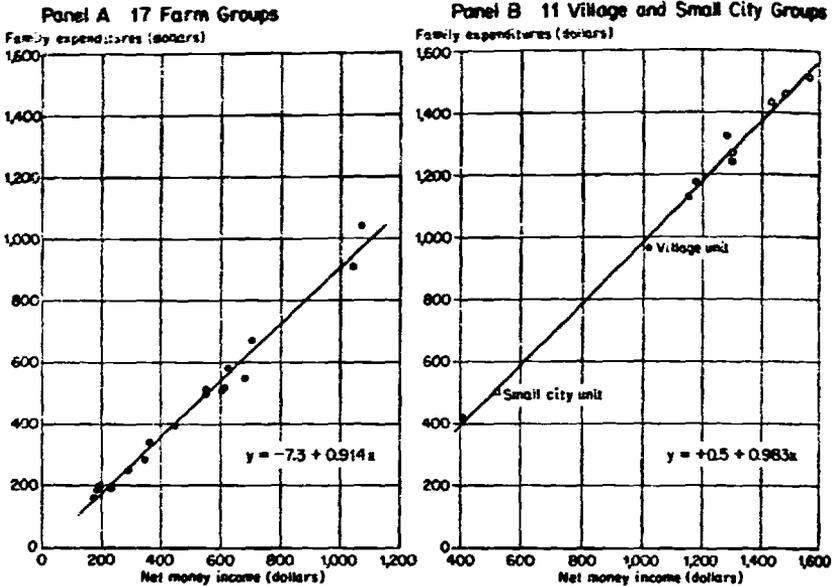
states are for 1935 when approximately half of the wheat acreage seeded in autumn 1934 in Kansas, Colorado, Montana, and South Dakota was harvested. In addition, wheat production in 1935 in North Dakota was about half of that of 1930; see *Agricultural Statistics for 1936* (1937), p. 8. The inclusion of these two areas would reduce the correlation and regression coefficients of the farm groups.

The data for the village and small city analysis units were limited to those in predominantly rural areas which were reported in the volumes published by the Department of Agriculture. In the Southeast white and negro families and farm operators and sharecroppers were classed as separate units.

Family Type I includes 2-person, husband and wife families only.

Chart 3

Expenditures for Family Living and Net Money Income at Median Income Family Type I, CPS, 1935-1936



Source: Table 2.

Year to year variability of income status has long been recognized as a factor reducing the relation between family income and expenditure. Simon Kuznets, for example, writes (*Studies in Income and Wealth, Volume Five, 1943, Part 1, p. 26*):

"The outlay of a family unit . . . during a given year . . . or its welfare within a brief time span may well be affected by its income for a much longer interval. The composition, absolute and relative, of a family's budget and its other activities are affected by receipts not only in a given year, but also in preceding years, and perhaps also those expected in the immediate future."

He goes on to point out:

"For the large group of independent entrepreneurs, family income may vary widely from one year to the next, yet for obvious reasons, amounts spent in any given year upon goods of various types . . . are likely to vary much less from year to year; hence they bear an irregular relation to the income for any given year."

Dorothy S. Brady also comments on the effect of the variability of the income of some families (*ibid.*, *Volume Thirteen, 1951, p. 48*):

"The effect of individual variations in income due to annual fluctuations in business income, illness, temporary unemployment, and various kinds of 'chance'

events should, if possible, be eliminated in measuring consumption by income level, for these variations tend to twist the consumption 'curve' toward the average and reduce the correlation between the independent variable, income, and most dependent variables, in particular, expenditures."

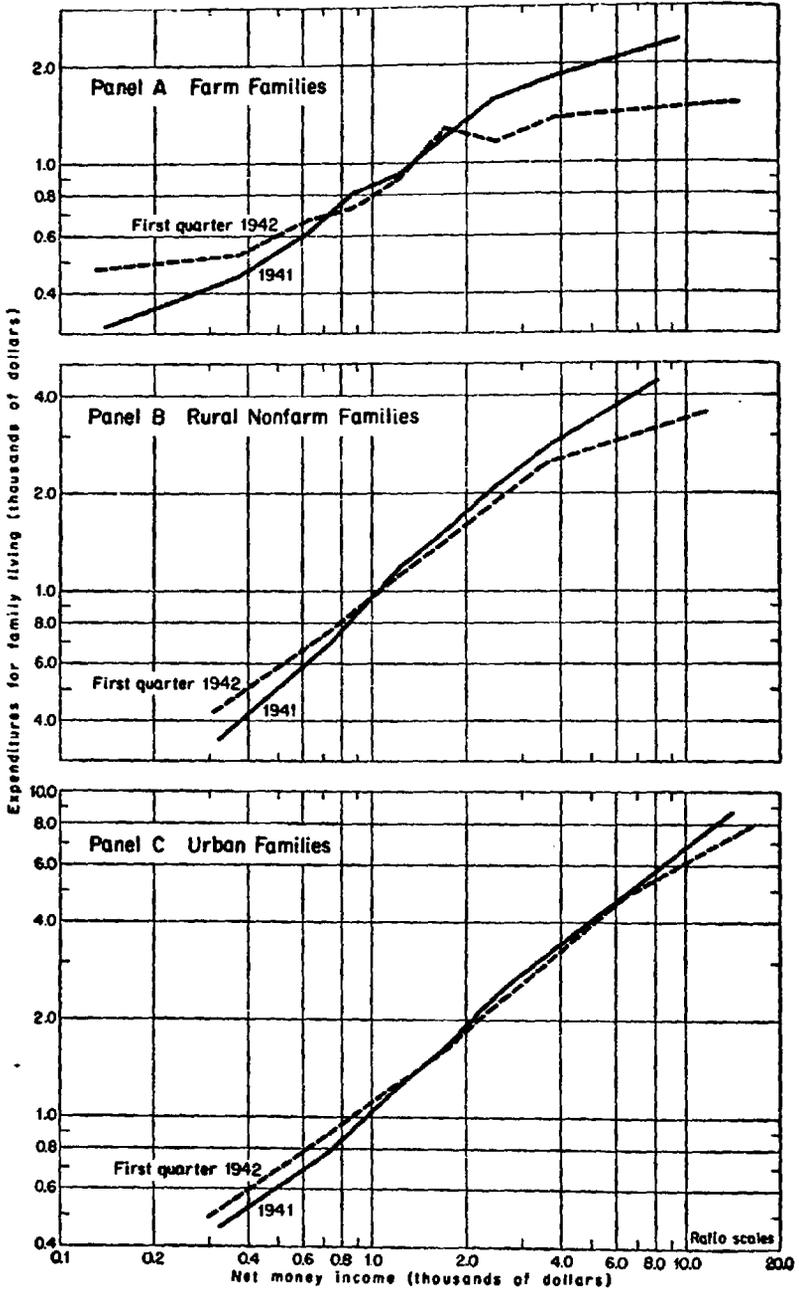
The effect of classifying families by an atypical income can be illustrated by comparing the income-expenditure patterns of families for 1941 and the first quarter of 1942 (Chart 4). No assumption is made that the 1941 income provides 'ideal' ranking. It is merely assumed that the income for the first quarter of 1942 is a poorer means of ranking families by relative economic level than is the 1941 income (the quarterly data for 1942 were multiplied by four). The flatter regression of the three groups of families for 1942 illustrates the type of effect on income-expenditure patterns to be expected when an appreciable number of 'high' income families are in 'low' income positions, and conversely, 'low' income families are in 'high' income positions (Panel A).

In similar comparisons for rural nonfarm and urban families (Panels B and C) flatter regressions occur for the first three months of 1942 than for the year 1941, but the difference is not nearly as striking as for farm families. For all three groups of families the difference between the two periods is in the direction one would expect if the first quarter income of 1942 were a less suitable indicator of economic rank than income for 1941.³ The higher average incomes in 1942 may have affected somewhat the slopes of the curves, but it seems improbable that the lower elasticity in the spring of 1942, even for nonfarm communities, was due wholly to this increase.

Full exploration of the factors determining the income-expenditure curves in Charts 1-4 is outside the scope of this paper. Four topics only are discussed: the income concept and problems of measurement with special reference to the analysis of farm family expenditures; types of income used in studies of farm family expenditures and the experience of investigators; patterns of farm expenses by net income classes; and various methods of classification that might be used in analyzing expenditures of groups of families whose incomes vary considerably from year to year.

³ The difference in the shape of the curves for the annual and the quarterly data and its implication for the study of the lag of expenditures behind income change appear to have been overlooked by Ruth Mack in 'The Direction of Change in Income and the Consumption Function', *Review of Economics and Statistics*, XXX, 1948, 239-58, and by James S. Duesenberry in 'Income-Consumption Relations and Their Implications', *Essays in Honor of Alvin H. Hansen, Income, Employment, and Public Policy* (Norton, 1948), pp. 54-81.

Chart 4
 Expenditures for Family Living and Net Money Income
 Families of Two or More, 1941 and First Quarter of 1942



A INCOME CONCEPT AND PROBLEMS OF MEASUREMENT

This consideration of income concept and measurement relates largely to entrepreneurial families for whom consumption and business are closely connected. Although farm operator families only are explicitly mentioned, the problems are similar when nonfarm entrepreneurial families are studied.

1 NET INCOME CONCEPT

Kuznets expressed the need for several income concepts but concluded (*op. cit.*, p. 13): "Whatever connotations the concept of the income of a family . . . may carry, their common and central core may be described as the net accretion of separable means of command over goods." For families this is not easily measured. During the early thirties the question of the most suitable income to use in investigating farm family spending was reviewed by a committee appointed by the Social Science Research Council. This committee too recognized that there might be need for several concepts. 'Spendable income', deemed the best measure of "income available for living",⁴ was defined as:

"The gross money income of the farm business, less the current operating expenses of the farm, less the taxes and insurance on the farm property and interest on the mortgage debt, and less expenditures for the replacement of worn-out equipment and livestock, in so far as the new do not represent any addition to the farm business plant."

The committee stated:

"This income concept really attempts to discover the income that can be spent either on farm family living, on enlarging the farm business or improving its equipment and livestock, or paying off the mortgage, or in various similar ways. As here defined it assumes that taxes, insurance and mortgage interest must be paid, and that tools, machinery, horses, etc., must be replaced exactly at the time they wear out."

The committee felt that

"Income obtained from work off the farm by the regular members of the family

⁴ John D. Black (ed.), 'Research in Agricultural Income, Scope and Method', Social Science Research Council, *Bulletin 6* (1933), pp. 12 and 13.

NOTE TO CHART 4

Department of Agriculture, *Miscellaneous Publication 520*, Table 49, and BLS *Bulletin 822*, Table 19. Income and expenditures for first quarter 1942 multiplied by 4. Two percent of farm families in 1941 and 19 percent in the first quarter of 1942 had negative incomes. For both periods the expenditures of these were relatively high in contrast with those of low positive income classes.

and from the investments outside the farm may or may not be included . . . depending on the uses to be made of the results. We shall include these if we wish to measure the well-being of the families residing on farms."

After reviewing various aspects of 'spendable income' including its failure to take into account income in kind from the farm or the change in inventories of livestock and crops, the committee was of the opinion that "If an indication of the usual income is desired, to include inventory gains and losses will improve it." Its report points out also that all outlays for equipment and machinery might be treated as expenses and an adjustment for increases or decreases in the value of equipment from the opening to the closing inventory be included in income.

This recommendation touches on the major issues affecting the definition of net income that bear on the classification of farm family expenditure data: income in kind; current farm expenses and capital outlays; inventory change; joint expenses for farm and family. In deciding how to treat these in measuring income for family expenditure studies one should consider their relation to the basic concept of net income, the feasibility of accurate measurements and the possible effects of crude estimates, and whether modification of the customary net income concept might result in ranking families more nearly by the permanent component of income, i.e., income free from the transitory components that cause the income to be up one year and down another.⁵

2 INCOME IN KIND

Home-produced food and fuel and the rental value of owner-occupied dwellings are important parts of the consumption of most farm families, and their measurement is essential in any comparison of the real income of farm and nonfarm families. Since money income and income in kind are likely to affect expenditures differently they should be treated as separate variables in any analysis of expenditures.⁶ Furthermore, income in kind is

⁵ One seems fairly safe in assuming that families decide to spend or to save on the basis of something approximating the permanent component of income. Of course, the change in their current income may endure and they may have looked upon it as merely a fluctuation around a long run average. The new position may persist for some time before it is recognized as a change. The greater the variability expected the slower families may be to recognize a change. A new condition might, however, lead to interpreting a specific change differently. For example, the bearing of an increase in income presumably due to a long run federal agricultural program might be different from a similar increase considered to be due to extra good harvest weather, something one can hardly count on every year.

⁶ See Margaret G. Reid, 'Distribution of Nonmoney Income', *Studies in Income and Wealth, Volume Thirteen*.

probably more stable from year to year than money income and hence relatively unimportant when effects of temporary shifts in income are being considered.

3 CURRENT EXPENSES VERSUS CAPITAL OUTLAYS

What is 'farm expense', to be deducted in determining net income, and what is 'capital outlay', to be classed with savings? For many items there is no simple answer. Outlays for the purchase of real estate and payments on the principal of mortgages have usually been excluded from farm expense. However, net payments on short term debts and capital improvements of various kinds have not always been excluded.

When separation of current farm expenses and capital outlays has been attempted, difficulty has arisen in handling outlays for the replacement of farm machinery and equipment and major repairs and upkeep. If outlays for replacements just equal capital used up during the year their inclusion in expense is conceptually sound. But for most farms in any one year outlays are likely either to understate or to overstate capital used up. If they overstate it, their inclusion in farm expense leads to an understatement of net income, and some families may be put far below their relative economic position. The effect is opposite if these outlays understate capital used up.

The alternatives most acceptable conceptually are probably the following: (a) to treat all outlays for replacement, repairs, and new farm capital as farm expense and to correct for any overstatement or understatement of current expense by adjusting for change in capital during the period covered; (b) to exclude all outlays for capital whether replacement, maintenance, or new, and to add to expense an amount for capital used up. Both methods require an estimate of depreciation for a wide variety of capital goods. Reliable estimates of depreciation are difficult to obtain from farm families since prices for used capital are very unstandardized even when prices are stable. Furthermore, even if reliable measures of average depreciation of separate types of capital for farms in general were available, they might have little relevance to the individual farms reporting; and in a study investigating family expenditures it is usually not feasible to collect the facts essential for reasonably accurate measures of capital depreciation on separate farms. If the definition of farm income calls for the above alternatives, the measures of income may be so crude as to reduce the validity of income as a measure of net accretion.

Other alternatives are (c) to include in farm expense only outlays for the things that, in the strictest sense, can be described as current operating expense and to ignore capital used up; (d) to restrict farm expense to

'current' operating expense plus outlays for replacement and repair only, ignoring any over- or understatement of cost for the year of the survey; and (e) to include all outlays for capital whether for new equipment or for replacements.

All these alternatives have certain shortcomings in terms of the usual definition of current net income. Furthermore, none may yield an especially good index of the permanent component of family income. Hence, instead of using any of the three types of income for classifying families it might be desirable to explore various modifications and to select the one most highly correlated with family expenditures. If the measure excluded outlays for the replacement of farm machinery and equipment, overstatement of income and of savings could be avoided by deducting their average from the income of the various categories. Outlays for these capital items may, for farms in the various categories, approximate the average cost of capital used up.

If data are available for more than one year, families may be classified by two, three, or four year income. The unusual outlays of single years then become less and less important and alternative (d) may be quite suitable for ranking families by economic level.

4 CHANGE IN INVENTORY

Some of the income produced in any one year may take the form of larger inventories, or cash receipts in any one year may overstate income produced because some inventories on hand at the beginning of the year have been liquidated. There is no question but what change in physical inventories would have to be taken into account in getting a measure of production during a given year. Its relation to the permanent component of income is less obvious.

The Social Science Research Council committee held that taking inventory change into account would increase the likelihood of obtaining a measure of 'usual' income. This may not always be true. Inventories may be built up because current cash receipts are adequate for usual outlays for both family and farm including usual payments on mortgages. In such instances cash receipts may be close to what the family regards as its income. This might occur in a 'good' year, and the reverse in a 'poor' year. If families followed such procedures net cash income would be a better measure of the permanent component of income than net money income, i.e., net cash income plus inventory change. Inventories may, however, rise or fall because of price expectations. When a rise is expected, inven-

ories may be expanded even when funds must be borrowed in order to finance current farm and family outlays.

If inventory change is to be measured, decisions must be made as to the types of product it is to cover and the method of valuation. Theoretically, in determining changes in economic level all assets should be valued. This has seldom if ever seemed feasible. Crops and livestock of the type commonly produced for sale are the usual types of inventory taken into account in income measurement. Two methods have been common: the change in value during a year, i.e., the difference between the value of the inventory at the beginning and at the end of the year; and the value of the change in inventory, i.e., the change during the year in physical inventory valued at prevailing prices.⁷ The first method appears to have been widely used in estimating the incomes reported by farm families to state agricultural experiment stations.⁸ The second method, used in both the CPS and SSW, attempts to exclude the effect of a rise or fall in price on the inventory that is still held. In surveys difficulty is encountered in getting reasonably accurate estimates without unduly burdening the schedule with questions in order to ensure that the kind and quantity of various types of physical inventory at two periods will be reported.⁹ The crudity of estimates of inventories is a major limitation on the inclusion of inventory change in income measures, even when family practices indicate that taking it into account increases the likelihood that current annual income will approximate the permanent component of income.

⁷ A measure of physical change in livestock may be quite complicated since a physical count of the change in the number does not mean the same thing as a change in the number of bushels of wheat or corn. At the end of the year the inventory of livestock may include several rather different categories: (a) There may be dairy cattle that were on hand at the beginning of the year, but they are now a year older, and may be more or less productive than at the beginning of the year. (b) There may also be some beef cattle that were on hand at the beginning of the year and have been fed all year. Even if the prices of beef cattle have remained unchanged these presumably would be more valuable than at the beginning of the year. (c) There may also be some feeder cattle purchased during the year at prices other than those prevailing at the beginning of the year; furthermore, they may already have been fed for a couple of months by the farmer whose income is being measured.

⁸ Conceptually these two methods are the same in periods of stable prices. When prices are changing they are, however, different. In periods of rising prices, e.g., the first method would usually show larger inventory increases than the second, and in periods of falling prices the reverse would occur.

⁹ If facts on physical inventories are reported, valuation could presumably be based on recorded market prices.

5 JOINT FAMILY AND FARM EXPENSES

Farm and family expenses are joint for several categories: for example, the expense incurred in providing the home-produced food and fuel on most farms is merged with general farm expense;¹⁰ many costs for owner-occupied dwellings such as taxes and interest on mortgages and insurance are in some studies treated as farm expense, and rent paid by tenant families for farm dwellings is usually a cost joint with the farm, no explicit family expense for it being recognized; utilities such as water, electricity, telephone, and automobile often have a common bill for farm and family. If measures of money income and family expenditures are to be complete, the portion that is incurred because of the family rather than the farm business must be excluded from farm expense. Allocations of expense between farm and family have seldom, if ever, been complete. In an investigation of expenditure levels among farm and nonfarm families or among groups of farm families it is very important to study carefully the allocation of these joint costs. However, they are probably of minor importance when the effect of annual variations in income is being analyzed. For the most part they are minor in comparison with total farm expense and, except for the automobile, are relatively stable from year to year.

6 DYNAMIC INCOMES

So far the concept and measurement of income have been considered primarily with reference to net accretion during a single year. Even if such net accretion were perfectly measured, the income might be quite inadequate for analyzing the relation of income to consumption, since a year may be too short to cover the variations in receipts the family takes into account in gauging its income level. It is generally accepted that three months are likely to be unrepresentative of the annual incomes of farm families. So also may be the income of an entire year. The greater the expectation that income will fluctuate — this year up, next year down — the less meaningful is it in an analysis of family expenditures. For example, in the Great Plains where bumper crops, outright failures, and moderately good years can be expected, annual income varies widely.

If expenditure curves were available from classifications by what families regard as the permanent component of their income it might be possible to isolate both short and long run effects of income change.¹¹ At any

¹⁰ If all farm produce is consumed by the family, all 'farm expenses' might be classed as family expenses. Under the definition of farm used in 1950 by the Bureau of Census, there are farms from which no farm products are sold.

¹¹ Consumer goods undoubtedly differ considerably in the degree to which they

one time the expenditures of some families might lag behind a real rise or decline in income while the spending of others would be adjusted to income. Without a suitable measure of the permanent component of income it is impossible to measure the effect of income on differences in expenditures among families at a given time or their response to income change when it does occur.

J. R. Hicks points out that income as a static concept gives little trouble: "If a person expects no change in economic conditions and expects to receive a constant flow of receipts, the same amount in every future week as he receives this week, it is reasonable to say that this amount is his income. . . . But suppose he receives a smaller amount in future weeks than this week . . . then we should not regard the whole of his current receipts as income; some part of it must be reckoned to capital account. Similarly, if it so happened that he was entirely dependent on a salary paid every fourth week, and the present week was one when his salary was not paid, we should not regard his income this week as being zero."

After examining various aspects of change in income and price, Hicks concludes, however, that the theory of income and savings in economic analysis provides "bad tools, which break in our hands".¹²

Without a developed theory as a framework for the interrelations to be investigated one is forced back on a commonsense approach relying on introspection and casual observation of the behavior of other persons. Income may be 'low' because of the temporary incapacity or unemployment of the main earner of the family, or because of a crop failure or unusually high operating expenses on the farm; it may be 'high' because of windfalls, overtime work, bumper harvests, or unusually low operating expenses. Many of these short run changes may be within the family's long run spending and savings plan, but they reduce the correlation between current income and expenditures. Measurement that minimizes the effect of such variation or that yields a measure of the permanent component of income is necessary in order to gauge the response of families to income change.

respond to short run changes in income. This probability was, e.g., pointed out by Kuznets (*op. cit.*, p. 27): "Outlays on certain types of goods respond slowly or not at all to short-term changes in income; outlays on others may respond promptly." He feels, however, that "our imagination does not reach to a point of segregating responses to short- and long-term levels of income". To investigate differences among consumer goods and services with respect to the response of expenditures to short and long run changes in income, broad categories of consumer goods such as food, clothing, and household furnishings are not especially useful.

¹² *Value and Capital* (Oxford University Press, 1938), pp. 172 and 177.

B NET INCOME USED IN VARIOUS INVESTIGATIONS¹³

John B. Canning's comment on the importance of income accounting seems pertinent to this review:¹⁴

"Extensive rationalization of economic conduct in economic arts is not to be expected unless, and until, the erratic character of the prevailing income accounting is remedied."

Differences in the income-expenditure curves seem to reflect decisions of investigators more than those of the reporting families. Some are probably due to too great optimism that a complex situation could be described by relatively simple techniques.

Studies of farm families' expenditures have presented classifications of current annual net income based on several concepts. Details concerning the definition of net income used in the classifications were often omitted from reports published in the twenties and thirties, nor was the income schedule reproduced. These omissions suggest that the possible effect of concept on expenditure patterns, was passed over lightly, if considered at all. In more recent studies the concept has been defined in some detail and income schedules published. However, only limited attention appears to have been given to the effect on expenditure curves of the income used in classification.

1 SOME EARLY SURVEYS

Among the early substantial surveys is that by E. L. Kirkpatrick and J. T. Sanders, 'The Relation Between Ability to Pay and the Standard of Living Among Farmers'. Data were collected from 861 white farm families in three southern states for 1919. In the analysis various measures of ability to pay were examined, among them 'disposable net income'. Con-

¹³In this review the bibliography by Faith M. Williams and Carle C. Zimmerman, *Studies in Family Living in the United States and Other Countries*, Department of Agriculture, *Miscellaneous Publication 223* (1935), was very helpful as well as the *Experiment Station Record*, published by the Department of Agriculture, Office of the Experiment Station. Primary data on income, expenditures, and savings have been collected by the Department of Agriculture and the agricultural experiment stations of land grant colleges in various states. Many investigations have been carried on jointly by the Department and one or more state agricultural experiment stations. Several Department agencies have participated in those investigations, notably the Bureau of Human Nutrition and Home Economics, the Bureau of Agricultural Economics, and the Farmers Home Administration (formerly the Farm Security Administration). Not all published reports of account data have been included. Those wishing to review the account data in detail will find a useful summary in *Agricultural Statistics, 1941*, pp. 573-5.

¹⁴'A Certain Erratic Tendency in Accountants' Income Procedure', *Econometrica*, I, 1933, 52.

cerning this the authors state (Department of Agriculture, *Bulletin 1382*, 1926, p. 23):

"Little or no relation was found between the disposable net income and expenditures. . . . This was to be expected since the net income of any number of farms is subject to wide fluctuations during any one year as well as over a number of years. Expenditures for family living are often made before the income from farm operations for that year is available. Funds accumulated during previous years or anticipated from farm operations of the future years are often drawn upon."

No tables were, however, given with families classified by 'disposable net income'. Kirkpatrick directed an extensive survey of farm family living covering 2,886 white families in 11 states during 1922-24,¹⁵ but facts on net income were not secured. In the report Kirkpatrick again comments on the probable shortcomings of farm income in any one year as a measure of the relative economic level of families.

Kirkpatrick later cooperated in a study of 900 Wisconsin farm families who reported for 1929-30.¹⁶ Data were classified by net cash income. Low coefficients of elasticity and low coefficients of correlation of expenditures with net cash income led the investigators to classify owner-operator families by the value of the owner's equity and all families by the number of cows per farm (Chart 5 and Table 3). The classification by owner's equity appeared to differentiate somewhat better than net cash income between families with very low and those with very high expenditures. On the other hand, classification by the number of cows per farm appears to be appreciably better than net cash income in separating families with low and high expenditures.

The coefficient of 'elasticity' (using a linear form on a logarithmic scale) of expenditures in relation to income is strikingly different in curves A and C. For curve C it is 0.73; for curve A it is 0.32 even when the first income class, constituting 14 percent of the families, is excluded.¹⁷ At an average net cash income of \$1,500 the coefficient of 'point' elasticity¹⁸ was 0.89 for the classification by number of cows per farm and 0.46 for that by net cash income.¹⁹ The number of cows per farm may be closely correlated with the permanent component of income of the families. With

¹⁵ The Farmer's Standard of Living, Department of Agriculture, *Bulletin 1466* (1926).

¹⁶ E. L. Kirkpatrick, P. E. McNall, and M. L. Cowles, 'Farm Family Living in Wisconsin', Wisconsin Agricultural Experiment Station, *Research Bulletin 114* (1933).

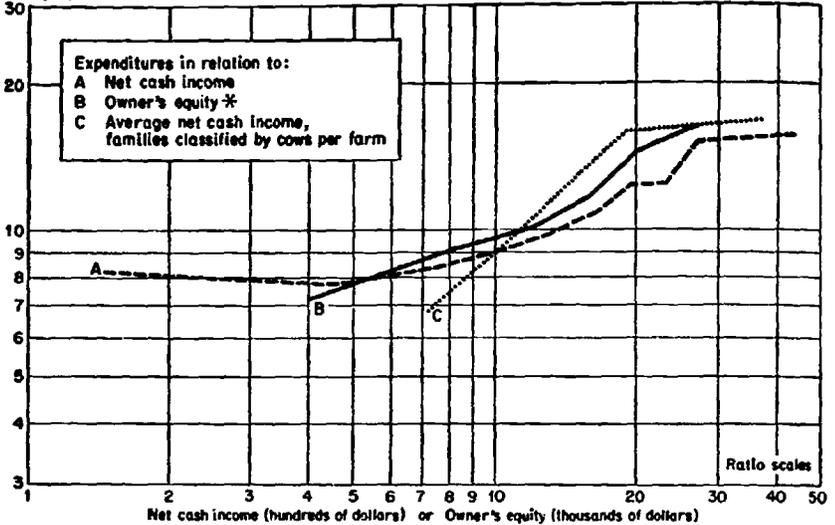
¹⁷ The part of the curve excluded is obviously nonlinear even on a logarithmic scale.

¹⁸ An approximation determined by the method of divided differences of the logarithms and linear interpolation.

¹⁹ For this curve, as for many others where farm families are classified by net income, the coefficient of elasticity is appreciably higher above than below the median income.

Chart 5
Expenditures of Wisconsin Farm Families, 1929-1930,
by Money Income, Owner's Equity, and Number of Cows per Farm,
Adjusted to Family Size of 4.3 Persons

Family expenditures (hundreds of dollars)



Source: Table 3.

* Plotted at midpoints of the classes.

families homogeneous as to type of farming, such a relationship does not seem unlikely. The authors conclude:

"Additional years are needed in the study to ascertain the continued degree of association between income and family living. One year's income may fail to measure completely the ability of the family to obtain consumption goods and services" (p. 11).

Many early investigators, e.g., in Kentucky, Ohio, Minnesota, New York, North Dakota, and Vermont,²⁰ appear to have rejected classification by net income in favor of classification by gross cash receipts. In general the expenditure curves from this classification do not have the marked asymptote at the lower income levels that characterizes curves A and B in Chart 2. The coefficients of elasticity of expenditures in relation to gross cash income and to average net cash income of the gross cash income classes are, however, relatively low and very similar. For some sets of data

²⁰ Kentucky Agricultural Experiment Station, *Bulletin 316* (1931); Ohio Agricultural Experiment Station, *Bulletin 468* (1930); Minnesota Agricultural Experiment Station, *Bulletins 246* (1928) and *255* (1929); New York (Cornell) Agricultural Experiment Station, *Bulletin 522* (1931); North Dakota Agricultural Experiment Station, *Bulletin 271* (1933); Vermont Agricultural Experiment Station, *Bulletin 340* (1932).

Table 3

Expenditures of Wisconsin Farm Families by Three Classifications
1929-1930

	Number of Families	Average Net Cash Income ^a	Family Expenditures	Family Expenditures Adj. to Family of 4.3 Persons ^b	Persons per Family
CLASSIFICATION BY NET CASH FAMILY INCOME					
<i>Income Class</i>					
Under \$300	126	\$145	\$817	\$820	4.2
300- 600	165	457	761	771	4.0
600- 900	155	755	832	835	4.2
900-1,200	116	1,049	905	909	4.2
1,200-1,500	103	1,308	983	980	4.4
1,500-1,800	89	1,657	1,088	1,088	4.3
1,800-2,100	50	1,945	1,246	1,228	4.7
2,100-2,400	35	2,336	1,259	1,237	4.8
2,400-3,000	28	2,719	1,527	1,516	4.5
3,000 & over	33	4,356	1,574	1,563	4.5
Total	900	1,103	957	957	4.3

	CLASSIFICATION BY THE 'EQUITY' OF OWNER-OPERATOR FAMILIES ^c				
<i>Equity Class</i>					
Under \$2,000	59		\$677	\$656	5.2
2,000- 6,000	217		716	722	4.1
6,000-10,000	153		908	908	4.3
10,000-14,000	123		990	1,003	4.0
14,000-18,000	80		1,164	1,169	4.2
18,000-22,000	42		1,470	1,448	4.7
22,000-32,000	22		1,668	1,638	4.8
32,000 & over	15		1,908	1,957	3.7
Total	712		951	951	4.3

	CLASSIFICATION BY NUMBER OF COWS PER FARM ^d				
<i>Number of Cows</i>					
0- 8	275	\$716	\$670	\$679	4.0
8-16	425	1,065	948	948	4.3
16-24	134	1,404	1,224	1,211	4.6
24-32	47	1,904	1,601	1,590	4.5
32 & over	19	3,737	1,733	1,674	5.3
Total	900	1,103	957	957	4.3

E. L. Kirkpatrick, P. E. McNall, and M. L. Cowles, 'Farm Family Living in Wisconsin', Wisconsin Agricultural Experiment Station, *Research Bulletin 114* (1933). All families had an adult man and woman.

^a Gross cash receipts from all sources minus all expenditures for the farm other than for farm real estate. New farm machinery, work stock, various types of farm improvements, and some debt payments were included in farm expenses.

^b Family size tends to be correlated with economic level. To minimize its effects family expenditures were adjusted to approximate those of a family of 4.3 persons, the average family of the entire sample; see Table 1, note †.

^c Owner-operator families only. The report does not specify whether 'equity' related to all assets or liabilities or only to 'farm'. Only 3 out of 188 tenant families had 'equity' of \$6,000 or more, whereas 40 percent of owner-operator families reported this amount.

^d Most of the farms were dairy farms.

families for whom off-farm income was important tended to be low on the gross income scale even when their net income was relatively high. Apparently these early investigators did not analyze the significance of the gross cash income classification. Perhaps it was used because it yielded more reasonable relationships than classification by net cash income.

2 CONSUMER PURCHASES STUDY

The first survey by the federal government in which farm family expenditures were presented by net income classes was the Consumer Purchases Study. The recommendation of the Social Science Research Council committee concerning farm family income seems to have been important in determining the net income concept used. Families were classified by total net income,²¹ defined as money receipts from all sources (other than liquidated assets, borrowed funds, and inheritances) minus farm 'expenses' plus the value of consumption in kind and of the change in crop and livestock inventories. Outlays for new buildings and for major machinery and equipment, if initial purchases, were classed as savings together with outlays for other improvements. In some regions the schedule did not include questions making possible the separation of current expenses from capital outlays even when the purchases were initial, such as outlays for new plantings for orchards. Farm expense included all repairs and replacements even when these were a net accretion to capital. The distinction between farm expense and capital was that used in estimating national farm income. No modification was made to take into account the difference in income as measured for distribution analysis and for national totals. This net income, like the concepts in earlier studies, caused expenditures to vary markedly at a given income level. Reports especially emphasized the wide range in the consumption of low income families.

"The primary explanation of such extremes of variation lies in the variable character of farm income. The net income of the individual farm family is subject to wide fluctuations from one year to another, and consumption is probably more closely related to the average of receipts over a period of years than to the income of a single year.

Some families whose incomes were customarily in the upper brackets may have had a net money loss from the operation of the farm during the year of the survey and consequently have had unusually low net family incomes. . . . Other families may have received net incomes that were well above the average of their experience. In either case, the consumption was probably not adapted to the income of the year in question, but was maintained at customary levels.

Families, operating farms on a relatively large scale, may suffer almost complete losses of income during the year because of drought, destruction of crops by insect pests, and the like. Such families are likely to have assets that can be

²¹ Described as "family income" in CPS reports.

liquidated or good credit standing so that the value of family consumption may be reduced little, if at all, from the level formerly maintained."²²

3 OTHER NATIONAL SURVEYS

In the SSW two major changes were made from the CPS in the income concept used in the main classification.²³ Income in kind was excluded and expense for farm machinery was treated differently. Families were requested to report the value of farm improvements and machinery and equipment on hand at the beginning of the year. These data provided the basis for an estimate of depreciation which was calculated at a standard rate for all families and added to current outlays for farm expense. Thus, a family that replaced a tractor or combine or other large equipment or machinery was less likely to be put in an income class far below that to which it would be assigned if the expense for machinery was amortized over the period of its use. In addition, those not replacing any machinery were assigned some expense if they reported some inventory.²⁴

In later surveys income in kind continued to be excluded from the classification as well as outlays for replacing major pieces of farm equipment.²⁵ However, allowance for depreciation has usually been omitted; so also has change in inventory.

4 AN ANALYSIS OF FARM FAMILY ACCOUNTS

W. W. Cochrane and Mary D. Grigg, using data from accounts, studied the effect of income change on family expenditures during 1940-42.²⁶ The data were collected by agricultural experiment stations or extension ser-

²² Department of Agriculture, *Miscellaneous Publication 465*, Part 2 (1941), pp. 43 and 47.

²³ One summary tabulation was based on a classification by total net income which included income in kind; see Department of Agriculture, *Miscellaneous Publication 520*, Tables 50 and 51.

²⁴ All outlays for improvements were not, however, excluded from farm expense. On a schedule for a national survey the detailed questions necessary to separate operating expenses from capital outlays are usually not adequate to take care of situations on unusual types of farms. In the SSW as in the CPS, e.g., outlays for plants and trees, even though original plantings, were classed as farm expense.

²⁵ There has been no national survey covering the farm population since 1942 in which all expenditures have been reported. However, surveys of consumer finances conducted annually by the Board of Governors of the Federal Reserve System collect data from a national sample including farm families on income, savings, and some types of consumer expenditure.

²⁶ *The Changing Composition of Family Budgets for Selected Groups of Corn Belt Farmers, 1940-42*, Bureau of Agricultural Economics (processed, Oct. 1946). Family data for the various states are combined. A preliminary report dated May 1946 shows data for each state separately.

vices in Illinois, Iowa, and Minnesota and by the Farmers Home Administration (FHA) from their clients who have loans for the purchase of farms in the same three states. The families who report to the experiment stations or extension services have incomes considerably above the average for all farm families in their respective states, whereas those receiving loans from the FHA for the purchase of farms have incomes close to the average for all farm families. The income concept was much the same as that of the CPS except that inventory change was not included. The findings of this study stress the slight relation between income and expenditures. Nothing is said, however, about the possible effect of the income concept or about the basic homogeneity of the group as a factor contributing to atypical incomes at high and low income levels. The more homogeneous families are, the greater the influence of short run variations in income in determining their income class in a given year.

5 REASONS FOR MODIFYING THE INCOME CONCEPT

Three needs appear to have been responsible for modifying the type of income used in classifying family data since the CPS: the desire to avoid any spurious correlation that may occur when income in kind is in the independent as well as the dependent variable; to use an income concept more closely correlated with money expenditures; and to simplify the schedule. The third appears to have been especially important in the exclusion of inventory change and the dropping of estimates of depreciation on farm machinery and equipment. To ensure even a fair degree of accuracy several questions must be added to the schedule.

No analysis has been noted bearing on the earlier assumption that taking inventory change into account tends to render annual income more valid as a measure of the economic level of families. Even if conceptually valid, the crudity of estimates of inventories might diminish rather than enhance its usefulness for studying families' response to income change.

C FARM EXPENSES BY NET CASH INCOME CLASS AND FAMILY EXPENDITURES

The determinants of net income data as they affect their suitability for ranking families by income cannot be examined thoroughly without experimenting with classifications and perhaps also collecting additional data that would permit further refinements in the concept. Certain analyses are, however, possible with published data. The analyses presented below use CPS reports and preliminary and final reports of the Cochrane-Grigg study.

1 OUTLAYS FOR REPLACING FARM MACHINERY AND EQUIPMENT

Expense for replacing certain types of farm machinery and equipment seems to have received more attention than any other aspect of the income concept used in classifying CPS data. Dorothy S. Brady and Faith M. Williams comment on it as follows:²⁷

"The element in the calculation that appears most seriously to have affected the interpretation of the expenditure data was the classification of money spent for the replacement of farm machinery and equipment as an expense item."

The initial CPS report of farm family expenditure stated:²⁸

"While it is reasonable to assume that the aggregate outlays of replacements during a given year approximate the annual depreciation allowance for a group of families, this procedure (that is, treating the entire amount of the outlay for replacement as a farm expense for the year of the outlay) has the effect of placing many families in income classes much lower than would have resulted from a more rigorous treatment of depreciation. At the same time, the incomes of the other families were somewhat higher than they would have been had depreciation been deducted along with money expenditures for farm operation. The procedure tends to increase the number of families for which the low income of the current year can be considered unusual."

The probable bearing on the economic ranking of families of including in farm expense outlays for the replacement of farm machinery is suggested by Chart 6 and Table 4. At the lower levels of total net income, average gross money income, outlays for replacing farm machinery and related items, and the value of the occupied farm dwelling and of family living are all relatively high. The data in Chart 6 are those of the analysis units of the CPS in which some families reported negative incomes (all were in the North or West). In all these analysis units a relatively high percentage of gross farm income, especially at the lower income levels, went to the expense category 'farm machinery and tools'.

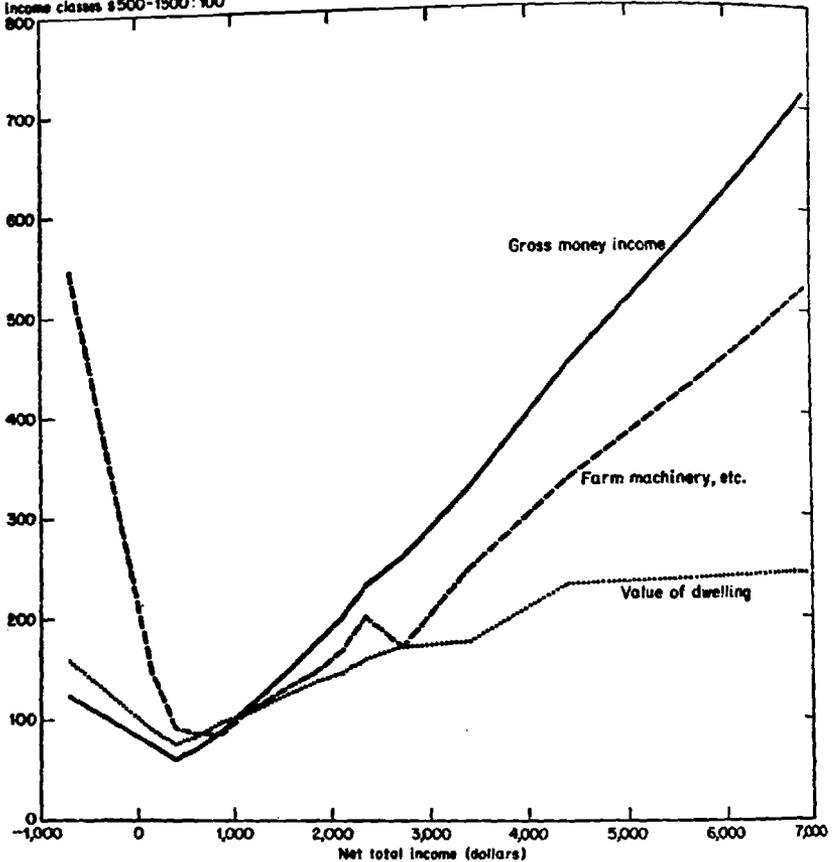
In Table 4 are summarized similar data for four analysis units in the Southeast, none of which reported any families with negative incomes. There is little or no indication that classing as expense all outlays for replacing farm machinery and equipment seriously affected the ranking of these families, at least to the extent of shifting to a low position many who were usually high on the income scale. Perhaps in the Southeast during 1935-36 farm machinery and equipment were much less important than for farm families in the North and West, or these items were being purchased initially rather than replaced. Such a difference explains some but not all of the differences in the consumption patterns in Chart 2.

²⁷ 'Advances in the Techniques of Measuring and Estimating Consumer Expenditures', *Journal of Farm Economics*, XXVII, May 1945, 319-20.

²⁸ Department of Agriculture, *Miscellaneous Publication 465*, Part 2, p. 347.

Chart 6
Gross Money Income, Outlays for Replacement of Farm Machinery and Related Items, and Value of Farm Dwelling, Farm Families in Selected Analysis Units, North and West, CPS, 1935-1936

Relatives with average for
income classes \$500-1500: 100
800



Source: Table 4. Value of family consumption is not shown. At most points it would coincide with value of farm dwelling occupied.

2 TOTAL FARM OPERATING EXPENSES BY NET INCOME CLASSES

Outlays for the replacement of farm machinery and equipment are probably not the only ones that contribute to unusually high or low incomes.²⁹ In the SSW, where these were not classed as farm expense, families who

²⁹ When families are classified by net income they may of course be put far below their true economic rank because of unusually low gross receipts rather than because of unusually high farm expenses.

Table 4

Average Total Net Income, Gross Money Income, Expenses for Farm Machinery and Related Items, and Value of Farm Dwelling Occupied and of Consumption, Consumer Purchases Study, 1935-1936

Total Net Income Class	Total Net Income (1)	Gross Money Income* (2)	Expense for Farm Machinery & Related Items (3)	Value of Farm Dwelling Occupied (4)	Family Consumption (5)
A THIRTEEN ANALYSIS UNITS IN NORTH AND WEST ^b					
Negative	\$-706	\$-1,764	\$375	\$2,269	\$1,141 ^c
0- \$250	148	1,082	103	1,299	971
250- 500	393	859	63	1,099	845
500- 750	629	1,029	59	1,190	918
750-1,000	876	1,257	59	1,390	1,051
1,000-1,250	1,120	1,553	73	1,508	1,189
1,250-1,500	1,374	1,872	83	1,668	1,342
1,500-1,750	1,619	2,173	92	1,832	1,450
1,750-2,000	1,864	2,531	101	1,965	1,573
2,000-2,250	2,109	2,840	115	2,093	1,729
2,250-2,500	2,362	3,313	138	2,288	
2,500-3,000	2,729	3,702	117	2,466	1,848
3,000-4,000	3,403	4,669	169	2,527	1,988
4,000-5,000	4,402	6,399	230	3,344	2,125 ^d
5,000 and over ^e	6,922	10,176	358	3,500	...

Average of \$500-1,500 Income Classes of North and West: 100

Negative	\$-71	\$124	\$547	\$158	\$102
0- \$250	15	76	150	90	87
250- 500	39	60	92	76	75
500- 750	63	72	86	83	82
750-1,000	88	88	86	97	94
1,000-1,250	112	109	106	105	106
1,250-1,500	137	130	121	116	117
1,500-1,750	162	152	134	127	129
1,750-2,000	186	177	147	137	139
2,000-2,250	211	199	168	145	152
2,250-2,500	236	232	201	159	
2,500-3,000	273	259	171	171	162
3,000-4,000	340	327	247	176	178
4,000-5,000	440	448	336	232	190
5,000 & over ^e	692	713	523	243	...

B FOUR ANALYSIS UNITS IN SOUTHEAST (WHITE OPERATORS)

0- \$250	\$161	\$274	\$7	\$265	\$427
250- 500	410	519	4	309	489
500- 750	627	541	8	405	683
750-1,000	877	839	14	546	873
1,000-1,250	1,120	1,104	17	629	1,092
1,250-1,500	1,355	1,287	17	761	1,274
1,500-1,750	1,616	1,609	31	962	1,402
1,750-2,000	1,859	1,970	40	963	1,530
2,000-2,250	2,116	2,272	46	1,185	1,789
2,250-2,500	2,371	2,461	33	1,160	
2,500-3,000	2,724	3,222	106	1,743	2,068
3,000-4,000	3,415	4,212	101	2,888	2,512
4,000-5,000	4,459	5,528	95	2,373	2,703
5,000 & over	8,894	14,101	689	4,200	3,623

Table 4 (concl.)

Total Net Income Class	Total Net Income (1)	Gross Money Income ^a (2)	Expense for Farm Machinery & Related Items (3)	Value of Farm Dwelling Occupied (4)	Family Consumption (5)
<i>Average of \$500-1,500 Income Classes: 100</i>					
0- \$250	\$16	\$29	\$50	\$45	\$44
250- 500	41	55	29	53	50
500- 750	63	57	57	69	70
750-1,000	88	89	100	93	89
1,000-1,250	113	117	121	108	111
1,250-1,500	136	136	127	130	130
1,500-1,750	162	171	221	164	143
1,750-2,000	187	209	286	165	156
2,000-2,250	213	241	329	203	182
2,250-2,500	238	261	236	198	
2,500-3,000	274	342	757	248	211
3,000-4,000	343	447	721	494	256
4,000-5,000	448	586	679	406	276
5,000 & over	896	1,495	4,922	718	370

Source: Department of Agriculture, *Miscellaneous Publications* 356, 383, 462, and 465. The data for columns (1)-(4) inclusive were taken from reports of income given for each analysis unit. An unweighted average was made. For column (5) the data for some units were given only in combination with those for another unit. Where this occurred the combination was given a weight of two in the averaging.

^a Gross money income does not take into account value of inventory change or the income in kind from the farm. The money income from nonfarm sources is a net figure.

^b These analysis units were those for which some farms reported a negative net total income. Only two analysis units in the North and West were excluded, those in Washington and Vermont. In these, no farms reported net losses for the year.

^c Value of consumption was reported for the negative income class for North Dakota and Kansas only.

^d For this income class value of consumption was reported for 7 out of 13 analysis units.

^e The report for North Dakota did not include any families in this income class.

^f Equal weights were used for each income class.

^g Analysis units of white 'operators' (sharecroppers were excluded) except the unit of self-sufficing farm families in North Carolina for whom gross money income from farming averaged \$190 and net money income from nonfarm sources \$307. It seemed of doubtful value to combine these self-sufficing operators with those whose major source of income was farming.

^h No North Carolina families were in this income class.

reported negative incomes or net losses had relatively high expenditures.³⁰ For the net loss category family expenditures averaged \$970 in 1941, whereas those for families in the first two positive income classes were \$561 and \$819 respectively.

Farm expenses in relation to gross receipts differed markedly among groups even when part time and self-sustaining farmers are excluded.

³⁰ Unpublished data provided by the Bureau of Human Nutrition and Home Economics.

Among the CPS groups farm operating expenses as a percentage of gross income ranged from close to 60 percent in New Jersey and North Dakota-Kansas to about 25 percent for negro operators (see Table 6). The percentages for the two groups analyzed by Cochrane and Grigg, FHA clients and families reporting to state colleges, were 33 and 60 percent respectively. Farm expenses and family expenditures in relation to net money income are shown in Chart 7, Panels A, B, and C for groups of CPS farm families. The two types of outlay are often directly related and have a similar pattern whether expenses for farm operation are relatively high or low.

In the various analysis units the relation between family expenditures and farm operating expenses was close at selected total net income classes, especially at the lower income level (Chart 8 and Table 5). Even at the \$2,000-2,500 level, which was well above the median income of all the communities surveyed, the correlation was positive. At any given income level farm operating expenses may seem relatively high if the net income used in ranking families is below its usual level; and net income may be relatively low merely because farm operating expenses are high or because gross cash receipts are relatively low. The relation between farm operating expenses and family expenditures at a given level of net income suggests that farm operating expenses may be a factor contributing to atypical incomes, and that an analysis of their pattern might contribute to an understanding of the expenditure curve of any classification used.

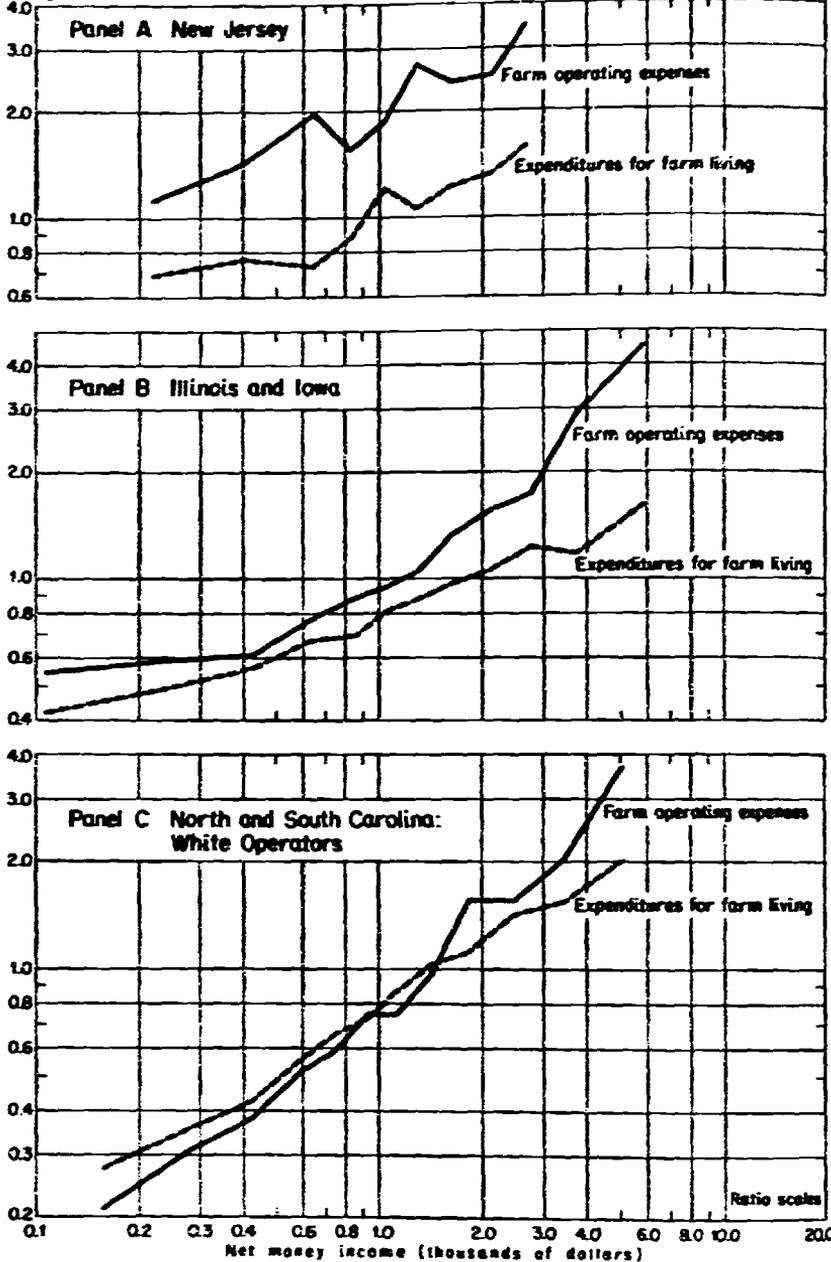
Despite great diversity of patterns of farm expense in relation to net income among the CPS groups farm operating expense tended, with few exceptions, to take a decreasing percentage of gross receipts the higher total net income is (Table 6). The decline in percentage is striking for (a) Kansas, North Dakota, and (b) South Dakota, Montana, and Colorado, an area with a high percentage of crop failures during the year of the survey. Striking declines occurred, however, in other units; for example, among California families farm operating expenses were 64 percent of total gross income for the quarter of families with lowest total net incomes and 42 percent for those with highest incomes. White farm operators in Georgia and Mississippi were the only group for which the percentage did not tend to fall as total net income rose when the broad groupings by fourths is used; the decline for white operator families in North and South Carolina is, however, slight.

This downward tendency in the percentage of gross income spent on operating the farm the higher the net income may be due to one or more

Chart 7

Farm Operating Expenses and Expenditures for Family Living in Relation to Average Net Money Income, 3 CPS Analysis Units 1935-1936

Outlays (thousands of dollars)



Sources: Department of Agriculture Miscellaneous Publications 383, 462 and 463. Families were classified by net total income. Negative income classes are omitted. Family expenditures are adjusted to a family size of 3.5 persons.

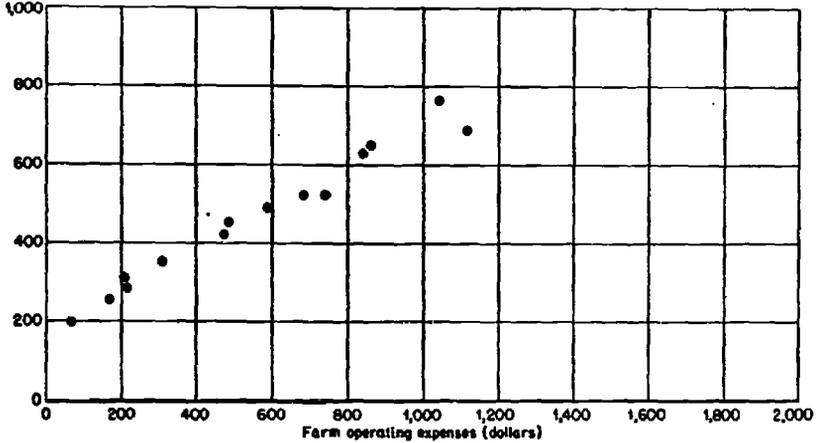
Chart 8

Family Expenditures and Farm Operating Expenses
at Selected Levels of Total Net Income, CPS, 1935-1936

Family Expenditures Adjusted to Those for Family of 3.5 Persons

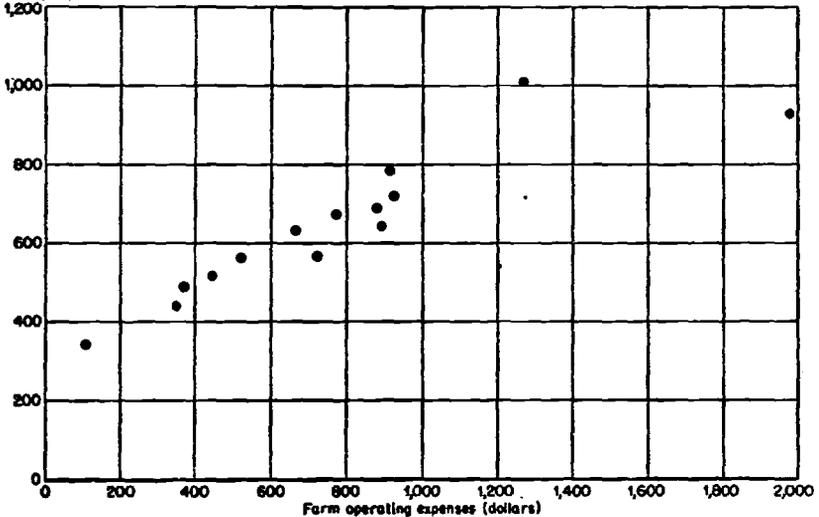
Panel A Net Total Income \$500-750

Family expenditures (dollars)



Panel B Net Total Income \$1,000-1,250

Family expenditures (dollars)



Source: Table 5.

conditions: 'low' gross receipts without a corresponding drop in farm expenses; 'high' receipts without a corresponding increase in farm expenses, perhaps because of relatively high efficiency at high income; 'high'

Table 5

Farm Operating Expense and Family Expenditures, for Selected Net Total Income Classes, CPS, 1935-1936

ANALYSIS UNIT	NET TOTAL INCOME CLASSES							
	\$500-750		\$1,000-1,250		\$1,500-1,750		\$2,000-2,500	
	Farm operat- ing expense	Family expendi- tures	Farm operat- ing expense	Family expendi- tures	Farm operat- ing expense	Family expendi- tures	Farm operat- ing expense	Family expendi- tures
New Jersey	\$1,115	\$687	\$1,982	\$929	\$1,884	\$1,210	\$2,419	\$1,234
California	1,040	766	1,267	1,010	1,806	1,206	1,883	1,523
N. Dakota, Kansas Colorado, S. Dakota, Montana	861	647	906	785	1,134	901	1,706	1,238
Vermont	839	626	928	720	884	876	1,488	1,049
Michigan, Wisconsin	744	524	893	640	1,366	922	2,012	1,201
Illinois, Iowa	685	524	880	688	1,267	858	1,600	1,078
Oregon, Washington	589	488	771	670	958	818	1,329	971
Pennsylvania, Ohio	487	451	665	630	817	907	1,254	1,054
	474	419	722	566	1,031	741	1,613	873
<i>White Operators</i>								
N. & S. Carolina	308	351	522	560	749	730	975	1,034
Georgia, Mississippi	212	284	445	514	631	763	1,019	1,124
<i>Negro Operators</i>								
N. & S. Carolina	209	309	352	429	409	603	...	...
Georgia, Mississippi	169	251	370	487	...	...	...	...
N. Carolina self-sufficing	64	199	108	341	172	589	...	...

Source: Department of Agriculture, *Miscellaneous Publications 356, 383, 462, and 465.*

In the CPS, farm operating expense included outlays for repairs and for replacement of machinery and equipment. Undoubtedly, other items that with stricter definition and enumeration would have been classed as capital outlays were also included.

Family expenditures include gifts and contributions. They are adjusted for family size of 3.5 persons using the scale developed by Dorothy S. Brady; see Table 1, note †.

These are the combinations of communities used in the report on family expenditures. It was assumed that the average expenses for

farm operation as reported in the income volumes are suitable measures of average expenses for farm operation of the families reporting family expenditures. Family expenditure schedules came from a subset of the sample reporting income. For some states an appreciable difference occurred in the income distribution of the two sets of schedules. In combining the income classes the weights in the report of family expenditures were used.

Farm operating expenses were not reported for sharecroppers in the Southeast, or of part time farms in Oregon; hence they are not included here.

The income classification included income in kind and may have had a minor influence on the relationships.

Table 6

Percentage that Farm Operation Expense is of Total Gross Income, Farm Families Grouped in Quarters, Ranked by Total Net Income, CPS 1935-1936

Analysis Unit (1)	Percentage Farm Operating Expense is of Gross Income ^a				
	ALL (2)	1st (3)	2nd (4)	3rd (5)	4th (6)
<i>Consumer Purchases Study, 1935-1936</i>					
Vermont	48	55	47	47	47
New Jersey	57	69	60	56	50
Pennsylvania, Ohio	41	45	39	39	42
Michigan, Wisconsin	44	51	45	44	41
Illinois, Iowa	40	50	41	38	37
Kansas, North Dakota ^c	59	102	61	48	42
South Dakota, Montana, Colorado	47	68	49	43	41
Washington, Oregon	40	54	43	35	37
California	48	64	53	47	42
<i>White Operators</i>					
North & South Carolina	32	34	31	30	32
Georgia, Mississippi	37	27	27	28	41
<i>Negro Operators</i>					
North & South Carolina	25	31	26	26	23
Georgia, Mississippi	24	31	24	22	23
North Carolina self-sustaining	9	10	9	9	9

Source: Department of Agriculture, *Miscellaneous Publications 356, 383, and 462.*

^a Gross income includes nonmoney income, in other words, the positive component from which expenses for farm operations were subtracted in determining net total income.

^b The average of the class in which the quartile fell was accepted as the average of the group in it. Expenses for farm operation in part related to the expenses of the consumption in kind. The range in the percentages would be little affected if it related to gross money income.

^c Expenses for farm operation were relatively high at the negative income class in all analysis units for which these were reported. However, North Dakota-Kansas was the only analysis unit for which family expenditure schedules were collected from those with negative net total incomes. In making this summary the negative income class was excluded.

expenses for farm operation without correspondingly high gross receipts; 'low' expenses without correspondingly low receipts.³¹

The effect of these four unusual conditions on the income distribution of any one year and hence on the expenditure curve is greater the more homogeneous the families are with respect to the permanent component of their incomes. If the families are entirely homogeneous the variability in any one year within the group would be wholly a matter of atypical

³¹ 'Low' and 'high' refer to 'unusual' conditions for the individual families whose incomes are being measured. Comparison among families is not implied.

conditions of gross receipts or 'expenses' for farm operation. If the families are very heterogeneous with respect to the permanent component of income each income class is more likely to have families at or near their true position.

3 POINT ELASTICITY OF EXPENDITURES IN RELATION TO NET INCOME AND RATES OF CHANGE IN FARM EXPENSE

It seems highly probable that the greater the importance of the transitory component of income the flatter will be the expenditure curve and hence the lower its coefficient of income elasticity; and that the relationship of farm operating expenses from one net income class to the next will give some clues to the way in which variation from year to year of farm operating expense contributes to atypical net incomes having high transitory components. Accordingly, two measures were determined for CPS data³² and for the sets of data published by Cochrane and Grigg: (a) coefficients of 'point' elasticity of net money income and expenditures using divided differences on a logarithmic scale and a linear interpolation of these in order to determine elasticity at a given net money income; (b) the ratios of farm operating expenses from one income class to the next (farm expenses of the lower income class equal 100). The ratio thus determined is called the 'farm expense ratio'.

Coefficients of elasticity and farm expense ratios for CPS groups are given in Table 7, A, for two net money incomes, \$500 and \$1,000. Chart 9, Panel A, shows a scatter of the farm expense ratios and the coefficients of point elasticity. By way of summary, coefficients of rank correlation of the two measures were determined. At the \$500 level the correlation of

COEFFICIENTS OF RANK CORRELATION

CPS COMMUNITIES	NET MONEY INCOME	
	\$500	\$1,000
13 in Northwest and Southeast	0.775	0.002*
9 in North and West	0.650	0.237†
8 in North and West	0.714	0.577†

* Only 11 CPS communities. Data were not available at this income level for two groups of negro operators.

† In Washington and Oregon \$1,000 happened to fall at a point where a marked break occurred in the two curves and where no averaging of the divided differences was possible with smoothing. The first figure includes and the second excludes 'Washington and Oregon'.

‡ All communities for which expenses for farm operation were reported, except 'self-sufficing' farm families in North Carolina, were included in the analysis.

Table 7

Coefficients of 'Point' Elasticity of Family Expenditures in Relation to Net Money Income and Farm Expense Ratios and Ranks, at Selected Income Levels

Analysis Unit	Coefficient of Income Elasticity of Family Expenditures	Farm Operating Expense Ratio	Coefficient of Income Elasticity of Family Expenditures	Farm Operating Expense Ratio
	A CPS COMMUNITIES, 1935-36, AT NET MONEY INCOME OF ^a			
	\$500		\$1,000	
Vermont	0.273 (3)	109.0 (2)	0.565 (6.5)	110.7 (5)
New Jersey	0.389 (6)	138.1 (12)	0.868 (9)	127.7 (10)
Pennsylvania, Ohio	0.443 (9)	121.2 (7)	0.416 (3)	123.2 (9)
Michigan, Wisconsin	0.380 (5)	113.2 (3)	0.565 (6.5)	115.9 (7)
Illinois, Iowa	0.412 (7)	122.6 (8)	0.630 (8)	111.5 (6)
North Dakota, Kansas	0.190 (2)	106.4 (1)	0.332 (2)	101.0 (3)
South Dakota, Colorado, Montana	0.157 (1)	115.0 (4)	0.101 (1)	99.0 (1)
Washington, Oregon	0.421 (8)	116.5 (5)	0.939 (11)	99.4 (2)
California	0.303 (4)	117.5 (6)	0.514 (5)	120.8 (8)
<i>White Operators</i>				
North & South Carolina	0.781 (13)	136.3 (11)	0.895 (10)	103.9 (4)
Georgia, Mississippi	0.721 (12)	132.7 (10)	0.503 (4)	137.2 (11)
<i>Negro Operators</i>				
North & South Carolina	0.552 (10)	124.5 (9)	...	...
Georgia, Mississippi	0.686 (11)	147.8 (13)	...	...
B ACCOUNT-KEEPING FAMILIES IN GROUPS OF MIDWEST STATES, 1940, 1941, 1942, AT TOTAL NET INCOME OF ^b				
	\$2,500 ^c		\$4,500 ^c	
<i>Families of Farm Management Associations^d</i>				
1940	0.468 (5)	122.8 (6)	0.659 (5)	127.6 (4)
1941	0.478 (6)	120.4 (5)	0.236 (2)	114.5 (2)
1942	0.385 (4)	109.6 (2)	0.238 (3)	115.4 (3)
<i>Clients of Farmers Home Administration^d</i>				
1940	0.368 (3)	110.1 (3)	0.725 (6)	146.5 (6)
1941	0.284 (1)	84.6 (1)	0.465 (4)	129.6 (5)
1942	0.359 (2)	117.8 (4)	0.226 (1)	99.6 (1)
C ACCOUNT-KEEPING FAMILIES IN SELECTED MIDWEST STATES, 1940, 1941, 1942, AT TOTAL NET INCOME OF ^e				
	\$2,500		\$3,500	
<i>Families of Farm Management Associations</i>				
<i>Illinois</i>				
1940	0.513 (11.5)	123.1 (13)	0.167 (2)	117.5 (4)
1941	0.491 (10)	122.2 (11)	0.379 (7)	120.2 (6)
1942	0.460 (9)	118.3 (7)	0.458 (11)	104.3 (2)
<i>Iowa</i>				
1940	0.217 (2)	102.3 (2)	0.481 (3)	133.6 (11)
1941	0.191 (1)	82.4 (1)	-0.154 (1)	96.5 (1)
1942	g	g	g	g
<i>Minnesota</i>				
1940	0.295 (6)	120.8 (10)	0.461 (12)	181.3 (14)
1941	0.251 (4)	106.2 (3)	0.300	140.2 (13)
1942	g	g	0.259 (4)	115.6 (3)

Table 7 (concl.)

Analysis Unit	Coefficient of Income Elasticity of Family Expenditures	Farm Operating Expense Ratio	Coefficient of Income Elasticity of Family Expenditures	Farm Operating Expense Ratio
<i>Clients of Farmers Home Administration</i>				
Illinois				
1940	0.571 (13)	122.6 (12)	g	g
1941	0.370 (7)	119.1 (8)	0.416 (9)	122.0 (8)
1942	0.593 (15)	120.4 (9)	0.302 (6)	120.5 (7)
Iowa				
1940	0.238 (3)	111.9 (5)	g	g
1941	0.441 (8)	111.0 (4)	0.221 (3)	119.3 (5)
1942	0.291 (5)	112.7 (6)	0.380 (8)	131.4 (10)
Minnesota				
1940	0.513 (11.5)	135.9 (15)	g	g
1941	0.575 (14)	130.8 (14)	0.420 (10)	124.6 (9)
1942	g	g	0.645 (14)	137.1 (12)

Figures in parentheses are ranks of analysis units.

'Point' elasticity was determined by the divided differences of the logarithms of net money incomes and family expenditures and interpolated to a given income.

Family expenditures were adjusted to a family size of 3.5 persons except for the FHA account-keeping families for 1941. For these, family size was not reported.

The farm expense ratio was the percentage increase in dollars of farm expense from one income class to the next. Linear interpolation was used to estimate the ratio at a given income.

All sets of data were classified by total net income. Since the importance of income in kind differed among groups in CPS regions, the estimates are given for a specified net money income. However, they show much the same relationship when the net total income approximating this net money level is used. Because the class intervals changed it was impossible to make the comparison at a higher income for more than a few groups.

* Source: Department of Agriculture, *Miscellaneous Publication 356, 383, 462, and 465*. The class interval of net total income was \$250-3,500.

^b Sources: W. W. Cochrane and Mary D. Grigg, *The Changing Composition of Family Budgets for Selected Groups of Corn Belt Farmers*, Department of Agriculture, BAE (processed, Oct. 1946). All families included provided reports for each of the three years. For these data families were grouped by \$1,000 net total income classes. Except for the FHA group for 1941, family expenditures were adjusted for family size.

^c Families whose accounts are summarized by state colleges or universities. Most are members of farm management associations.

^d Families who borrowed from the FHA in order to purchase farms.

^e Midpoints of the income intervals \$2,000-3,000 and \$4,000-5,000 respectively. No adjustments were made for minor deviation of net money income from the midpoint. It was not possible to give these measures for either lower or higher income level. Even for these incomes, some classes with very few families were used.

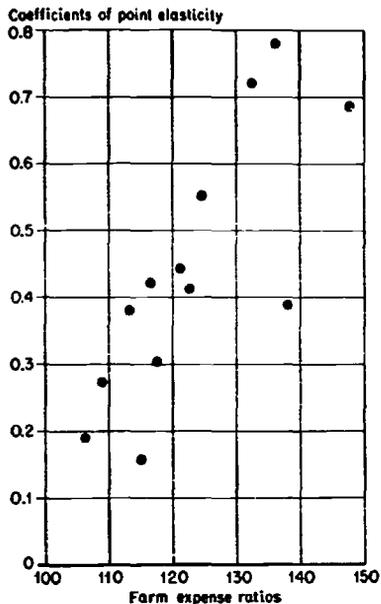
^f Data taken from a preliminary report dated May 1946. Some comparisons used classes with fewer than 10 families.

^g Insufficient data.

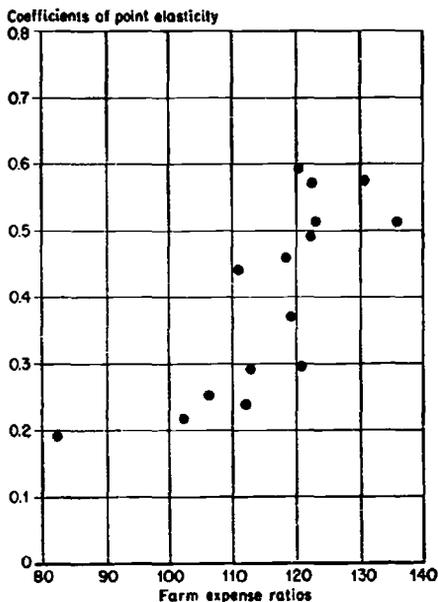
Chart 9

**Coefficients of Point Elasticity in Relation to Farm Expense Ratios
Groups of Farm Families**

Panel A
Farm Families in 13 CPS Analysis
Units, 1935-1936 at Net Income
of \$500



Panel B
Farm Families in Three Midwest States
1940, 1941, and 1942 at Net Income
of \$2,500



Source: Table 7, Sections A and C.

the two types of measure is high. At \$1,000 the two groups in the Southeast are quite outside the general pattern of the groups in the North and West. One reason may be that diverse areas were combined into one classification; for example, the Georgia-Mississippi data combined families from the Delta in Mississippi and from a cotton area in Georgia. Average incomes and farm operating expenses were very different: for Mississippi the latter were \$1,434 and the former were \$2,117; for Georgia the latter were \$366 and the former were \$955.³³

Coefficients of point elasticity and farm expense ratios were determined for Midwest families for the three years from data for the states combined for the two economic groups, and for each economic group in each state (Table 7, B and C; Chart 9, Panel B). For these Midwest families as for the CPS groups, especially those in the North and West, the correlation of

³³ Department of Agriculture, *Miscellaneous Publication 462* (1941), Tables 30 and 33,

the two measures is high. By way of general summary, coefficients of rank correlation of these two measures were determined also for the two economic groups combined for the various states. They were respectively 0.71 at total net income of \$2,500; 0.83 at \$3,500; and 0.91 at \$4,500.³⁴

A similar summary of the relation of these two measures for each state and year showed that at total net income of \$2,500, the coefficient of rank correlation was 0.83: for farm management associations, 0.96 and for FHA clients, 0.64;³⁵ at total net income of \$3,500, it was 0.62 for all states and years, 0.40 for farm management associations,³⁶ and 0.83 for FHA clients.

4 GROUPS WITH LOW FARM OPERATING EXPENSES

For the six CPS farm groups for which farm expenses were low but for which data were not published coefficients of 'point' elasticity of family

GROUP	COEFFICIENTS OF	
	'Point' Elasticity of Expenditures in Relation to Net Money Income of \$750 ^a	Elasticity of Expenditures in Relation to Net Money Income for the Curve in General ^b
Part time farms, Oregon	0.56	0.67
Sharecroppers		
<i>White</i>		
North and South Carolina	0.65	0.69
Georgia, Mississippi	c	0.77
<i>Negro</i>		
North and South Carolina	0.54	0.55
Georgia, Mississippi	0.50	0.77
North Carolina self-sufficing farms	0.69	0.64

Source: Department of Agriculture, *Miscellaneous Publication 465*, Part 2. Family expenditures were standardized to a family size of 3.5 persons; see Table 1 for a description of this adjustment.

^a See note 18.

^b The data used were those in the published reports when families were classified by total net income. The elasticities were much the same as if the families had been classified by net money income except for the first positive income category which may include some negative net money incomes. For this reason this category was omitted.

^c The range of incomes reported did not permit an estimate for this group at \$750.

³⁴ Data for \$2,500 and \$4,500 incomes are shown in Table 7, B.

³⁵ The few large deviations in rank were in every instance associated with an income class with a few families.

³⁶ Table 7, C. It was not possible, from data for the separate states, to derive measures at an income level of \$4,500 for more than a few states.

expenditures at a net money income of \$750 and the elasticity of expenditures for the expenditure curve as a whole were determined.³⁷ As elasticities of 0.7 are not unusual for nonfarm families, it does not seem unreasonable to assume that the incomes of these farm families vary at least as much from year to year.

5 CONCLUDING REMARKS

The variability of farm operating expenses, which may be due in part to the concept and to the accuracy of enumeration, may well have a bearing on the form of the expenditure curve derived from a given set of data. Thorough analysis of farm operating expense as a factor would begin with data for individual families and explore the significance of certain concepts. A multivariate analysis with gross receipts and farm operating expenses as independent variables might be fruitful.

D CLASSIFICATIONS SUGGESTED FOR GROUPS WITH HIGHLY VARIABLE INCOMES

A major problem in investigating farm family income-expenditure patterns is how to bypass, as it were, the transitory component of income in order to estimate the relation of expenditures to the permanent component of income since this is the type of income that families probably have in mind when planning their spending, i.e., the income to which their spending is either adjusted or in the process of being adjusted. Three general methods of classification have already been referred to. The first is to avoid the use of a net income concept for which it is obvious that large capital outlays are being treated as current operating expense or for which the crudity of measurement (as of inventory change and depreciation) seems likely to introduce gross errors in ranking. The second method is to lengthen the period covered by the income. The third method is to classify families by some measure of economic level other than current net income in the hope that the average values of such categories will provide a measure of the permanent component of income from which the effect of a transitory component has been largely or wholly removed. Several types of classification illustrating this third method are briefly discussed.

³⁷ Among the groups for whom farm expenses were reported, some had relatively low expenses for farm operation: e.g., all groups in the Southeast. The income elasticity of expenditures for these groups was also relatively high; see Chart 1, curves C and D.

1 CLASSIFICATION BY EXPENDITURES²⁴

Vickrey advocated classification of families by expenditures instead of income in order to avoid the unsatisfactory results arising from the year to year variability of income:²⁵

"Classification by income will probably be innocuous enough if only the data permitted classification by income for a fairly long period so that fluctuations could be averaged. . . . Incomes fluctuate in varying degree from year to year, not only together with national income but also as a result of developments affecting the individual. . . . 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 . . . 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 expectation regarding his future income, as well as his actual current income."

There seems to be an implicit assumption in this recommendation that family expenditures vary less from year to year than income. It seems highly probable, at least for urban families, that total expenditures vary as much from year to year as income,⁴⁰ if one treats extraordinary outlays as current expenditures, as is done in most studies. If one classifies by expenditures the concept of current expenditures would have to be scrutinized in much the same terms as the concept of income. Dorothy S. Brady states the problem as follows:⁴¹

"In many early studies income data were not collected and families were classified by expenditures; see, e.g., Department of Agriculture, *Bulletin 1466*. When such data are used, it is important to realize that the high expenditure categories are likely to be dominated by items especially important in causing family expenditures to be relatively high in a given year in comparison with other years: for instance, expenditures for medical care, household furnishings, and equipment. Data classified by 'value of consumption' were used by H. Gregg Lewis and Paul H. Douglas, 'Studies in Consumer Expenditures, 1901, 1918-19, 1922-24', *Journal of Business*, University of Chicago, XX, 4, Oct. 1947, Part 2, to determine the "proportion of marginal expenditures spent" on and the "elasticity of expenditures" of various consumption categories.

"Resource Distribution Patterns and the Classification of Families', *Studies in Income and Wealth, Volume Ten* (1947), pp. 272-3.

"Three investigations provide measures of year to year variability of income, for the most part relating to nonfarm families: Milton Friedman and Simon Kuznets, *Income from Independent Professional Practice*; Frank A. Hanna, J. A. Pechman, and S. M. Lerner, *Analysis of Wisconsin Income*; Horst Mendershausen, *Changes in Income Distribution during the Great Depression* (NBER, 1945, 1948, and 1946 respectively). The first two studies give coefficients of correlation of income in consecutive years of about 0.9. The third reports the interrelation of annual incomes with two years intervening.

⁴¹ *Ibid.*, Volume Thirteen, p. 49.

"Total expenditures, including 'unusual' outlays for medical care, or the purchase of automobiles and durable goods, would seem to defeat the purpose of the entire procedure, for infrequent large expenditures may press the total far above the amount characteristic of the 'usual' level of living. That level is probably better described by the total outlay for the goods and services that appear year after year in the family budget — food, housing, clothes, films, gasoline, and so on. When some such total has been determined, the merits of various income concepts can be explored statistically."

Even if there is a central core of family expenditures that fluctuate much less from year to year than such income measures as are feasible, expenditures may still be unsatisfactory as a means of ranking families in order to study expenditures in relation to income. At a given level of income families in a single community that are similar in age and number, home ownership status, and extent of home production may differ a good deal in their spending merely because some people are naturally 'spenders' and some are 'savers'. Open handed spenders would get a high economic rank and close fist ed spenders would get a low rank. Thus classification by even the 'stable core' of expenditures would tend to yield relatively high savings at low income levels and low savings at high income levels.

2 CLASSIFICATION BY NET WORTH

Because facts on net worth have seldom been available in family expenditure studies the use of net worth has not been widely discussed as a means of classification in the study of income-expenditure patterns. For farm families at least it seems reasonable to expect the net worth to be highly correlated from year to year. Its correlation with income is probably higher the more homogeneous the families are with respect to age of head, tenure, and type of farming. There seems some likelihood that net worth is more highly correlated with the permanent component of the income of farm than of nonfarm families; farm investment, which is reflected in net worth, is an index of the size of the enterprise and of future income as well as of success in management. Apart from a relatively small percentage of entrepreneurial families, the nonfarm earner is seldom required to furnish a large part of the capital he uses in his job. The investment that determines his income is in greater degree a human investment, in training, for example.

There is also a question whether classification by net worth would not in some degree rank families according to their propensity to save; high net worth is in part a result of decisions to save instead of spend. Hence an objection similar to that noted for the classification by a stable core of family expenditures may apply to the net worth classification. The effect of bias from the classification is, however, reversed. For the net worth classi-

fication there is the possibility that expenditures in relation to average net cash income from the net worth categories would be relatively high at low net worth levels, and relatively low at high levels.

The greater elasticity of expenditures in relation to income from the classification by cows per farm than by net cash income in the Wisconsin study gives some indication of the possible merits of a classification by net worth. It seems highly probable that difficulties of measurement are likely to be encountered: for example, all those involved in measuring inventory change and depreciation without a core of transactions as receipts and outlays for which imputation is unnecessary. Inaccuracies are likely to be greatest in periods of rapidly changing prices. Even so, this is a type of classification that might well be explored whenever the data permit.

3 CLASSIFICATION BY INCOME OF EARLIER YEARS

Economists are indebted to Friedman and Kuznets for developing the concepts and methods of measurement of transient and permanent components of income using a classification by income of another year. In an analysis of income for a two year period they write (p. 325):

"A man's relative income status in any two years will be determined in part by factors that are common to the two years: personal attributes such as training, ability, personality; attributes of the man's practice such as its location, type, organization; and accidental influences whose effects are present in both years. Superimposed on these factors are transitory influences that affect this income in only one of the two years; influences that are likely to be interpreted by the man affected as 'accidental' or 'chance' occurrences, though in reality they may be the result of definite causal factors at work, and may even reappear at intervals associated, for example, with cyclical fluctuations in general business activity. Let us call the part of a man's income determined by the first set of factors the 'permanent' component, and the part determined by the second set, the 'transitory' component. The magnitude of the two components will depend on the period covered. Factors that are 'permanent' for a particular pair of years may not be for a longer period, or a different pair of years; factors that are 'transitory' change correspondingly; lengthening the period considered will in general increase the range of factors considered 'transitory'. The separation could be fixed and constant only for a man's whole career treated as a unit."

They later qualify this clear cut distinction (p. 352):

"The dichotomy between permanent and transitory components of a man's income . . . necessarily does violence to the facts. An accurate description of the factors determining a man's income must substitute a continuum for the dichotomy. This continuum is bounded at one extreme by 'truly' permanent factors — those that affect a man's income throughout his career — and at the other by the 'truly' transitory — those that affect his income only during a single time unit. . . . Between these extremes fall what may be called 'quasi-permanent' factors, factors whose effects neither disappear at once nor last throughout a man's career."

They point out also (pp. 326-7):

"There is of course no way of isolating the permanent and transitory components of the income of a particular man. We can measure only his actual income, and we can classify men only by their actual incomes. The difference between the average income of men in the same actual income class and the average income in the profession as a whole will consist of two parts: (1) the difference between the average permanent components for these men and for the profession as a whole, and (2) the average transitory component. (The average transitory component for the profession as a whole can, without loss of generality, be defined as zero since we are interested in relative income status.) If the permanent and transitory components of a man's income are uncorrelated then both parts of the difference between the average income of an income class and the average income of the profession will tend to have the same sign; e.g., an income class above the average for the profession will tend to have an average permanent component above the average permanent component for the profession and a positive average transitory component."

Friedman and Kuznets conclude that the nature of the correlation between the transitory and permanent components of the income of two years could be tested in two ways: by the form of the relationship of the two incomes and by the relation of the transitory component of the income categories of the base year to the deviations of the mean income of the classes from the mean income of the group as a whole (p. 331). If the transitory and permanent components of income are uncorrelated, the relation of the incomes of the two years will be linear; at the same time the transitory component of the income classes of the base year will be a constant percentage of the deviation of the income of the class from the mean income of the group. When these relationships occur for a given income class of the base year the average income for the other year will be a measure of the average permanent component of the group. If the permanent and transitory components are not correlated, the distribution should be useful in explaining the income-expenditure pattern.

4 CLASSIFICATION SELECTED BY CORRELATION ANALYSIS

Correlation analysis has been used in exploring the interrelations of farm family expenditures with various indexes of economic level. Marianne Muse, for example, reported coefficients of correlation of family expenditures and selected indexes of economic level: 0.61 for gross cash income; 0.44 for net worth; and 0.31 for acres per farm.⁴² Apparently no one, however, has systematically tested a great variety of items that might be used. Until this is done it seems probable that each investigator of farm family expenditures will find himself confronted with the same question: What is

⁴² 'The Standard of Living on Specific Owner-Operated Vermont Farms', Vermont Agricultural Experiment Station, *Bulletin 340* (1932).

the best way of ranking these families to show the effect of income? An index with several components may be best. It may vary with region and with type of farming. In such an experiment it seems desirable to have farm income data of such a type that a wide variety of measures could be developed in addition to gross cash receipts and the types of net cash income already used.

In comparing the usefulness of various classifications it seems valid to assume:

- a) That expenditures tend to be directly correlated with the permanent component of income.⁴³ Accordingly, coefficients of correlation, regression, and elasticity will be positive, and negative coefficients will be prima facie evidence that the method of ranking was unsuitable, at least in the part of the range where such a relationship is found.
- b) That within certain limits the higher the coefficients of correlation, regression, and elasticity of expenditures in relation to income, the better the ranking.⁴⁴
- c) That even when other factors that affect spending can be identified and held constant, expenditures will vary considerably in relation to income, partly because of the timing of the more costly types of purchases such as electrical appliances, automobiles, and expensive vacations.⁴⁵ But such variation is largely independent of the economic classification.
- d) That the relation of expenditures to the permanent component of income is rather stable from period to period and group to group. Consequently, unless the analysis yields fairly stable relationships, it would seem best to continue the search for a better method of ranking families.

⁴³ Kuznets writes (*Studies in Income and Wealth, Volume Five, Part 1, p. 14*): "If, for example, we wish to establish relatively stable relations between income and, let us say, expenditures on staple foods (to serve possibly as a basis for forecasting their amount), we should perhaps confine income to service earning and exclude not only such items as capital gains but even some property income items. If we seek to foresee short term changes in expenditures on medical care, which for a given family are intermittent and may call for emergency mobilization of all its economic resources, we may deem it advisable to include under family income not only all service and property receipts, capital gains, etc., but even amounts borrowed or proceeds from property liquidation during a given brief period."

⁴⁴ Indicators of economic resources selected for such exploration must, of course, meet certain conceptual tests. Since the search is for factors determining expenditure, classification by total annual expenditures would obviously be meaningless.

⁴⁵ Expenditures for some categories would of course be expected to vary more from family to family than total expenditures, which are affected by the relative preference for present consumption over savings; and families that are alike in this respect may differ in their emphasis on food, clothes, household furnishings, and other items.