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AN INCOME-NET WORTH APPROACH
TO MEASURING ECONOMIC WELFARE

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TO MEASURING ECONOMIC WELFARE

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ABSTRACT

The objective of this paper is to present an empirical measure of economic welfare, hereafter called "economic position," which integrates current money income and current net worth. We apply the resulting measure illustratively, comparing some of its results with those of the income measure. Subsequently, some of the implications of our measure are explored.

The proposed measure rests on the assumption that current income and current net worth are both important determinants--although not the sole determinants--of the economic position of a consumer unit.

It is well known that the distribution of income and the distribution of net worth differ significantly. Were it not for these differences--if the relative position of the various consumer units were more nearly identical in the two distributions--then it would be less important to attempt to integrate these two distributions. Such an integration would still be useful, however, if we wished to apply an absolute standard for determining the level of economic position, e.g., "affluence" or "poverty."

Merging income and net worth gives rise to difficulties, for income is a flow while net worth is a stock. The procedure proposed involves converting net worth into a flow by translating it into an annuity.

For any given consumer unit--individual, family, or household--we propose measuring its "economic position" at a given time as the sum of (1) its current annual adjusted income and (2) the annual lifetime annuity value of its current net worth.

The most striking result of using the new measure is its impact on the economic position of the aged, who, by this measure, appear to be considerably "better off" than is shown by the current income measure. This results from the interaction of income, net worth holdings, and life expectancy.

An Income-Net Worth Approach
To Measuring Economic Welfare

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I. Introduction

Economists and public policy-makers alike have long been concerned with the relative and absolute economic welfare of various segments of the population. This interest reflects an underlying concern both about the equity of the existing distribution and about our ability to explain and forecast more effectively the behavior of producers and consumers.¹

The concern of this paper is with the development of an approach for measuring current economic welfare which is operationally feasible and more comprehensive than the traditional money-income measure. The approach we propose considers only two of the numerous elements--current income and current net worth--relevant to determination of economic welfare, and so we stop well short of an "ideal," comprehensive measure. We show that use of our measure will, under certain reasonable assumptions, lead to policy prescriptions rather different from those generated by the current income measure of economic welfare.

*We wish to acknowledge the excellent research assistance of Martha Strayhorn, and the general support provided by the Institute for Research on Poverty, of the University of Wisconsin. Helpful comments on an earlier draft were made by Robert J. Lampman and Hirschel Kasper.

¹There is a long literature on the measurement and extent of inequality in the size distribution of income. For a review of some of this work as well as for useful bibliographic references, see Irving B. Kravis, The Structure of Income: Some Quantitative Essays (Phila.: University of Pennsylvania, 1962); and T. Paul Schultz, The Distribution of Personal Income, Joint Economic Committee, U. S. Congress, Washington, D. C., 1965.

Let us think of economic welfare, \underline{W} , for a given individual or family unit, \underline{i} , \underline{j} , etc. in the following way:

$$W_t^i = w (Y_t^i, NW_t^i, S_t^i, C_t^i, K_t^i, W_t^j, \dots) \quad (1)$$

where \underline{t} indicates time, and $t = 0$ and $t > 0$, denote, respectively, the current period and each future period, when flow variables are involved, and denote a point within these periods when stock variables are involved; Y = total (including non-money) income; NW = net worth; S = family size; C = "cost of living" in the area; and K = degree of knowledge regarding market prices and other elements of "effective" expenditure of money. The inclusion of W_t^j takes account of the interdependence of welfare among individuals.² (This list is not meant to be exhaustive.) The impact of these variables on current economic welfare has been studied frequently-- particularly in connection with recent efforts to measure the extent of "poverty" in the United States³--but little or no attention has been given to their integration into a single empirical welfare indicator.

²We are indebted for this point to Hirschel Kasper who suggests that this may be related to the idea of the "culture of poverty."

³Representative of this work are the following studies:

- a. on current money income: Council of Economic Advisers, Economic Report of the President, 1964, Chapter 3.
- b. on expected future income: Burton A. Weisbrod, "An - Expected-Income Measure of Economic Welfare," Journal of Political Economy, LXX (August, 1962), pp. 355-367.
- c. on net-worth: Dorothy S. Projector and Gertrude S. Weiss, Survey of Financial Characteristics of Consumers, Board of Governors of the Federal Reserve System, 1966.

We propose an initial step toward such an integration--by developing a measure of current economic welfare based on a combination of current income and current net worth (assets minus debt). Although data on these two variables are frequently available, and although data on income and net worth are in apparently-commensurable dollar units, the two types of information have not usually been combined. The reason appears to rest largely on the fact that income is a flow while net worth is a stock--thus making the data actually incommensurable. At the same time, the fact that money income includes the current yield from at least a portion of asset holdings⁴ does imply that net worth--or, more particularly asset-

(Footnote cont.)

- d. on family size: Mollie Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin, Department of Health, Education and Welfare, January 1965, pp. 3-29.
- e. on the cost of living: Harold W. Watts, "The Iso-Prop Index: An Approach to the Determination of Differential Poverty Income Thresholds," Journal of Human Resources, II (Winter, 1967), pp. 1-18.
- f. on knowledge: David Caplovitz, The Poor Pay More: Consumer Practices of Low-Income Families (New York: Free Press, 1963).
- g. on interdependence: economists have done virtually no empirical work, though the work of sociologists on the "culture of poverty" might be interpreted as a step in this direction, e.g., U. S. Department of Labor, The "Moynihan" Report.

⁴For any given level of total assets, the extent to which their yield is reflected in "income" depends on the comprehensiveness of the income concept--in particular, whether it includes imputed as well as money income. For example, the Census Bureau money income series which we are using in this paper includes only explicit money receipts, while the recently-abandoned OBE series on the size distribution of "personal income" included imputations of income from such assets as housing and checking accounts.

holdings--is not entirely disregarded by a money-income measure.⁵

The objective of this paper, then, is to present an empirical measure of economic welfare, hereinafter called "economic position," which integrates current money income and current net worth. We apply the resulting measure illustratively, comparing some of its results with those of the income measure. Subsequently, some of the implications of our measure are explored.

We want to make it very clear that our intent is to devise a means for comparing the economic position of consumer units having different combinations of income and net worth. Since some families have more income than others but less net worth, the question of which families occupy a higher economic position is presently an open one. In short, we are interested in establishing appropriate tradeoffs between current income and net worth.

II. The Measure

The proposed measure rests on the assumption that current income and current net worth are both important determinants--although not the sole determinants--of the economic position of a consumer unit. A unit's economic well-being or economic position should be thought of as a function of the flow of services over which it has command. This flow depends on the consumer unit's current income and also on the services it receives from its assets, net of liabilities. Of course, expected future income

⁵We note, however, that although income from assets is counted in income, interest on debt is not subtracted even though the debt may have been incurred to purchase the assets. It is paradoxical that the use of a money income measure of a consumer unit's economic welfare implies that the unit would be "better off" if it acquired more money-yielding assets, irrespective of the interest rate it would have to pay if it borrowed, and irrespective of the fact that if it borrowed, net worth would be unchanged in the process.

or "permanent" income is also relevant, particularly insofar as it may influence current access to capital markets. Although in our empirical work below we disregard expected future income, this variable certainly deserves further attention.

It is well known that the distribution of income and the distribution of net worth differ significantly.⁶ Were it not for these differences--if the relative position of the various consumer units were more nearly identical in the two distributions--then it would be less important to attempt to integrate these two distributions. Such an integration would still be useful, however, if we wished to apply an absolute standard for determining the level of economic position, e.g., "affluence" or "poverty."

Merging income and net worth gives rise to difficulties for, as noted earlier, income is a flow while net worth is a stock. The procedure we propose involves converting net worth into a flow by recognizing that it is translatable mathematically into an annuity.⁷

For any given consumer unit--individual, family or household--we propose measuring its "economic position," Y^{i*} , in time period t , as the sum of (1) its current annual income (the precise measure of income, which is net of yield on net worth, will be specified later), Y_t , and (2) the

⁶See Projector and Weiss, op. cit.; and Harold F. Lydall and J. B. Lansing, "A Comparison of the Distribution of Personal Income and Wealth in the United States and Great Britain," American Economic Review, Vol. II (March, 1959), pp. 43-67.

⁷The authors used this approach in examining the relevance of assets to the definition of "poverty," in an unpublished memo (August, 1964) while staff members for the Council of Economic Advisers. The approach has also been used by Janet Murray, "Potential Income from Assets: Findings of the 1963 Survey of the Aged," Social Security Bulletin, Department of Health, Education and Welfare, December 1964, pp. 3-11. Also see Projector and Weiss, op. cit., pp. 37-41, for a somewhat similar approach.

annual lifetime annuity value of its current net worth, expressed as $NW_t \cdot A_n \cdot A_n$ is the value of an n year annuity whose present value is

$$\$1 \quad A_n = \frac{r}{1 - (1 + r)^{-n}} . \quad (\text{From this point on the superscript } r$$

will be discarded.)

$$Y_t^* \equiv Y_t + NW_t \cdot A_n . \quad (2)$$

Y_t^* is, thus, the income obtainable in period t if the unit's net worth were converted so as to yield a lifetime flow.

The annuity value, $NW_t \cdot A_n$, is a function of the amount of net worth, NW_t , the life expectancy of the consumer unit, as denoted by n , and the rate of interest, r . Thus, for any given interest rate, the greater the net worth of the unit, and the shorter its life expectancy, the greater will be the annual annuity, and therefore the greater will be the difference between Y_t^* and Y_t . This suggests that the distribution of economic position by age will differ significantly depending on whether the combined income-net worth measure or the current income measure is used. In particular, since older people have higher ratios of net worth to current money income, as well as shorter life expectancies, their economic position will be most affected by the consideration of net worth.

We wish to reiterate that we are simply providing a method for ranking the economic position of consumer units which differ in their current incomes as well as in their net worth holdings. In proposing this measure we are not implying either that people generally do purchase annuities with any or all of their net worth, that they necessarily should do so, or that they can do so. We regard the problem of making income and net worth commensurable as conceptually independent of the practical

possibilities for converting net worth into an annuity. For the fact is, that if our method of combining income and net worth is regarded as unsatisfactory -- on the grounds that actual conversion is either difficult or undesirable -- some other method is needed. It is hardly satisfactory to simply disregard net worth, and any measure of economic position which considers both, necessarily implies some tradeoff -- conversion relationship -- between them.⁸

Before we turn to applications of the income-net worth measure it is useful to consider the rationale for the decision to examine the annuity value of net worth over the consumer unit's expected lifetime, rather than over some other, shorter or, for that matter, longer period. There are a number of possible alternatives. At one extreme is the traditional current measure, by which economic position is measured by current money income. Thus, in effect,

$$Y_t^* \equiv Y_t . \quad (3)$$

This formulation assumes that the only determinant of economic position in a given year is money income in that year. This implicitly assumes

⁸With regard to the practical aspects of conversion, there are some interesting issues which, however, are outside the bounds of this paper. For example, consider the net worth of older people, in the form of housing. They frequently prefer to continue occupying homes rather than relocating in smaller quarters more appropriate to their reduced family size; and although they may not be opposed to the idea of converting their homes into annuities by selling them and leasing them back, the market for such transactions seems quite undeveloped. We can only speculate as to why this sort of arrangement is so unusual. This market may have been simply overlooked by financial institutions. Alternatively, there may be no real demand for conversion of home equity into an annuity. In addition, it does seem that commercial annuities have paid very conservative rates of interest, and thus have been rather unattractive. Clearly, additional research into the operation of annuity markets is in order.

that net worth is irrelevant as a determinant of economic position except insofar as it influences current income.⁹ At the other extreme, economic position might be measured under the assumption that net worth is to be annuitized entirely during the current period;¹⁰ this implies a measure of economic position:

$$Y_t^* \equiv Y_t + NW_t . \quad (4)$$

There are, of course, an infinite number of other possibilities.¹¹ The alternative which we have used involves the assumption that net worth is to be annuitized over the expected lifetime of the consumer unit. This decision, while arbitrary, is consistent with the spirit of much recent empirical research that suggests that saving (net worth accumulation) is in large part motivated by a desire to smooth out patterns of normal lifetime consumption and to build up reserves to take care of unanticipated needs arising from, for example, medical expenditures.¹²

⁹Actually, net worth could, as a result of saving or dissaving, increase or decrease during the income period t , without having any real effect on economic position as measured by current money income.

¹⁰This case is discussed in Martin David, "Welfare, Income and Budget Needs," Review of Economics and Statistics, XII (November, 1959), pp. 393-399.

¹¹One is to assume that net worth is annuitized over some arbitrarily specified time period, such as the maximum time period consistent with raising Y_t^* by some specified level. For an example of this approach, see Projector and Weiss, op. cit., pp. 37-41.

¹²Harold W. Guthrie, "Intergeneration Transfers of Wealth and the Theory of Saving," Journal of Business, XXXVI (January, 1963), pp. 97-108; also John B. Lansing and John Sonquist, "A Cohort Analysis of Changes in the Distribution of Wealth," presented at Conference on Research in Income and Wealth, March 1967 (mimeo).

A decision to annuitize all of a unit's net worth over its lifetime, or indeed over any shorter period, implies that no net worth will remain at the time of death of the unit. But if it is felt that a portion of net worth should be regarded as being held in trust as an estate for the survivors or for others, then only the remaining portion of net worth should properly be annuitized.¹³ In any case, a decision regarding the treatment of estates should be recognized as involving both a factual question of the extent to which people do save for estate purposes,¹⁴ and a social value judgment regarding the desirability of intergenerational wealth transfers (at death and at other times)--that is, whether people ought to save for estate purposes.¹⁵ These issues clearly deserve more attention.

In the empirical work which follows we shall arbitrarily base our calculations on the assumption of lifetime annuitization of net worth with no estate exclusion. The approach presented is general enough, however, to embrace alternative assumptions regarding the period of

¹³If an estate of size E is desired at the time of "expected" death n years hence, then with an interest rate r , the amount of net worth available for conversion to an annuity at time t will be $NW_t = \frac{E}{(1+r)^n}$.

If, alternatively, it is desired to guarantee an estate no smaller than size E regardless of when death occurs, then the amount of net worth available for conversion to an annuity will be smaller, namely, $NW_t = E$.

¹⁴The fact that intergenerational transfers are so frequently made via the estate route rather than by transfers before death may be less an indication of people's desires to pass on their wealth than it is a reflection of their inability to anticipate the time of their death.

¹⁵Guthrie, op. cit.

annuitization and size of estate, and, indeed, whether all components of net worth should be included. When the phrase, "income-net worth," is used in the remainder of this paper it refers to Y_t^* in expression 2, above, with net worth being annuitized over the consumer unit's expected lifetime.

III. Applications and Implications

Uses for the income-net worth measure of economic position are numerous, ranging from reassessment of the extent of economic inequality to use in predicting consumption behavior. In this section we focus, first, on the extent of economic inequality as indicated by the combined income-net worth measure of economic position for families, then touch upon the implications of the findings for government anti-poverty policy, and for the definition of tax progressivity and regressivity, and, finally, venture a comment on the usefulness of the measure for the prediction of consumer expenditure behavior.

The basic sources of data for our income-net worth estimates of economic position are the Survey of Financial Characteristics of Consumers (SFCC) and the Current Population Survey (CPS), for 1962. The SFCC provides data on families by age of head, income, and net worth; the CPS provides data on family income by age of head, broken down into finer income classes. In view of the greater detail on income provided by the CPS data, and its larger sample size at the lower income levels, we chose to combine the SFCC data on net worth with the CPS data on income. Full details regarding the method of calculation are described in the Appendix to this paper, obtainable from the authors upon request.

Briefly, the nature of the calculations employed to create the income-net worth measure of economic position are as follows. From the SFCC the median value of total net worth for families by income size class was determined.¹⁶ It was then assumed that the net worth for this income class in the SFCC data was equivalent to the net worth for the same income class from the CPS data. However, since the income data already include a return from income-yielding assets, an estimate of this return had to be deducted from income before the annuity value of net worth was added; otherwise there would have been double-counting of net worth.

We then determined the size of the lifetime annuity that total net worth could produce. In calculating the value of the annuity we used a 4 percent and a 10 percent interest rate, alternatively, to give a notion of the sensitivity of the results. In estimating joint life expectancy values--the other component of the annuity calculation--we assumed that family heads (males) were five years older than their wives, and that the full annuity would be received while both husband and wife were alive but that the surviving spouse would receive two-thirds of the annuity during the remainder of his or her life.¹⁷

Extent of economic inequality. One important application of the income-net worth concept is to the measurement of economic position or of the extent of economic inequality. In this subsection we compare results

¹⁶Median rather than mean net worth was used, in view of the highly skewed distribution of net worth holdings within income size classes. For further elaboration, see Appendix. The net worth data in the SFCC--unlike the CPS income data--did not distinguish between families and unrelated individuals as we would have preferred, except for the under \$3,000 income class. See Appendix for further discussion.

¹⁷Here we follow the approach used by Janet Murray, op. cit.

obtained through use of the income-net worth measure with those obtained through use of the more conventional, current money income measure.

If economic position is measured by current money income, then the distribution of economic position of United States families in 1962 is as indicated in Table 1, column 1. It shows, for example, that 20 percent of all families--9.3 million--were below \$3,000, and 18 percent--8.3 million--were above \$10,000.

If, however, economic position is measured by the more comprehensive income-net worth measure, the entire distribution is shifted upward and its shape is altered, as is shown in Table 1, columns 2 and 3. By this measure, the fraction of all families whose economic position is below \$3,000 per year falls to 18 percent at a 4 percent rate of interest--a drop of nearly one million families--and to 17 percent at a 10 percent rate of interest--a drop of 1.4 million families. The fraction above \$10,000 rises to 23 and 27 percent, respectively--increases of 2.2 to 4.2 million families. The median economic position, \$5,960 per year by the current income measure, rises to \$6,480 at a 4 percent rate and \$6,750 at 10 percent.

The change in the entire distribution is portrayed by the Lorenz curves in Figure 1.¹⁸ They indicate that the degree of inequality is greater by the income-net worth measure than by the income measure alone. This is true even though as Table 1 shows, families are generally "better off," in absolute terms, than income alone would suggest. The greater inequality shown by the income-net worth measure reflects the fact not only that net worth holdings are, on average, positive in all income classes specified,

¹⁸The Gini coefficients are as follows: for the income measure, 0.37; for the income-net worth measure at a 4 percent interest rate, 0.42; and at a 10 percent interest rate, 0.47.

Table 1
Percentage Distribution of Families
By Two Measures of Economic Position, By Income, 1962

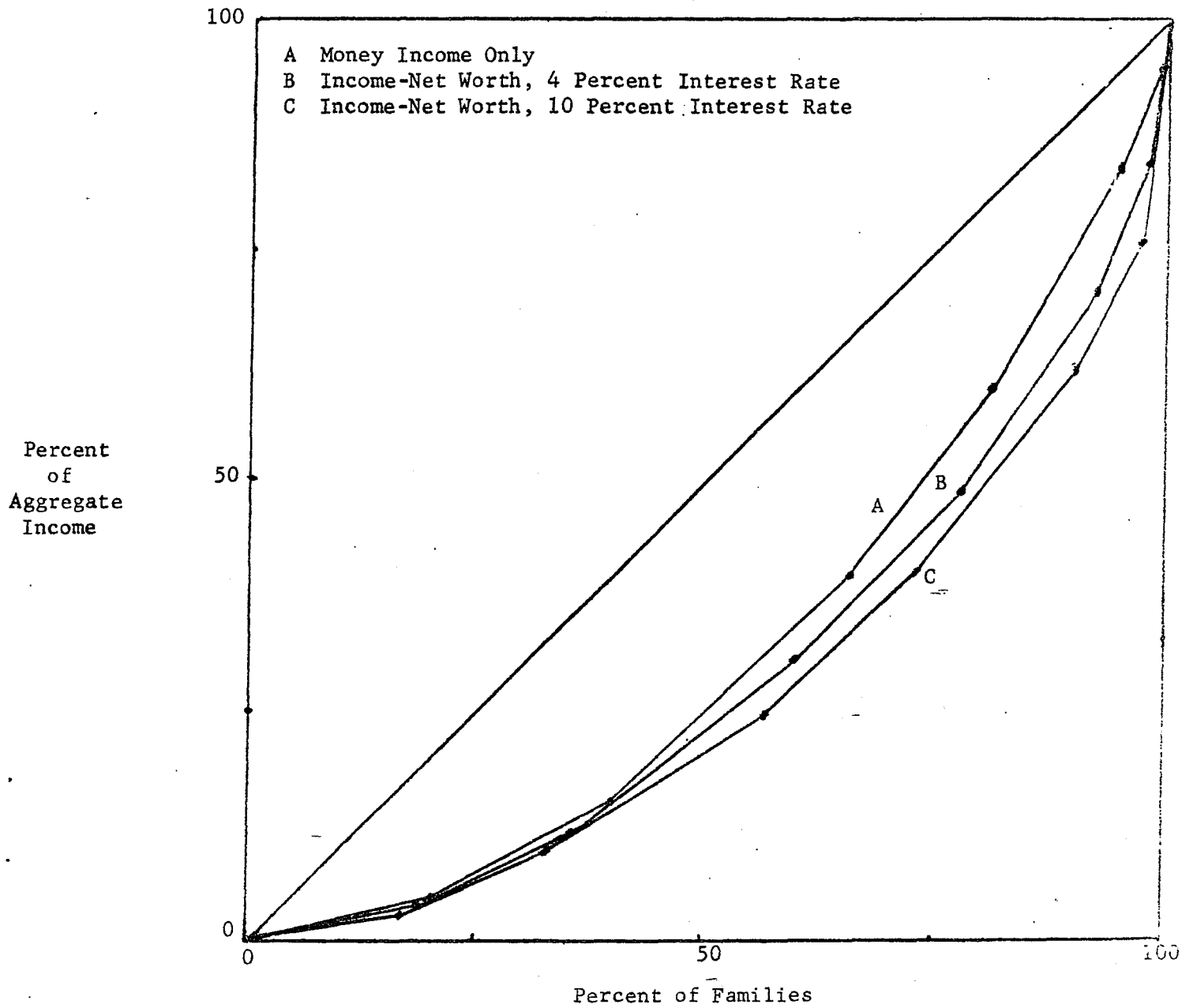
<u>Income Size Class</u>	<u>Percentage Distribution of Families</u>		
	<u>Current Money Income</u>	<u>Income-Net Worth</u>	
		<u>4 Percent</u>	<u>10 Percent</u>
	(1)	(2)	(3)
Under \$3,000	20	18	17
3,000 - 4,999	19	17	16
5,000 - 7,499	27	25	24
7,500 - 9,999	17	17	16
10,000 - 14,999	13	15	17
15,000 - 24,999	4	6	7
25,000 and Over	1	2	3
Total	100	100	100
Median	\$5,960	\$6,480	\$6,750

Source: Column 1 -- Current Population Report, Series P-60, No. 41, Table 3, p. 26.

Columns 2, 3 -- Based upon data from Current Population Report, Series P-60, No. 41, Table 3, p. 26, and Survey of Financial Characteristics of Consumers; see Appendix to this paper for method of calculation.

Figure 1

Lorenz Curves:
Percentage Share of Income and Income-Net Worth
Received By Families, 1962



Note: None of the Lorenz curves cross.

but also that, except for the lowest income class, the ratio of net worth to income rises with income, as shown in Table 2.¹⁹

The effect of considering net worth in addition to income varies considerably with the age of the group, as noted earlier. This is illustrated in Table 3 which presents both measures of the distribution of economic position of families, classified by age of head. Reading across any row we see that the relative differences and, in general, the absolute differences between the percentages of families in that class by the two measures increase with age. For example, in the \$5,000 to \$7,499 income class the difference between columns (1) and (2) is about 6 percent (2 percentage points), while the difference between columns (7) and (8) runs to about 50 percent (9 percentage points). But a look at columns (9) and (10) shows how the averages for "all ages" mask these important differences among age classes. The reasons for these differences are found in Table 4 which shows that the ratio of net worth to income rises dramatically with age, while life expectancy obviously decreases with age.

Lorenz curves in Figure 2 for the four major age groups reveal clearly how the distributions of money income and of income-net worth diverge with age.²⁰

¹⁹The lowest income class violates this generalization largely because it contains a higher proportion of aged--roughly one-third--than does the next higher income class--for which the fraction is about one-fifth (calculated from Current Population Report, Series P-60, No. 41, Table 3, p. 26). This fact is significant because the aged (65 years and older) have a higher average ratio of net worth to income than do younger families; see Table 4, infra.

²⁰The Gini coefficients for the income measure and the income-net worth measure based on a 10 percent interest rate, are as follows:

<u>Age of Family Head</u>	<u>Income</u>	<u>Income-Net Worth</u>
Under Age 35	0.31	0.35
35-54	0.35	0.43
55-64	0.39	0.50
65 and Over	0.52	0.62

Table 2

Median Income and Median Net Worth of Families,
By Income, 1962

<u>Income Size Class</u>	<u>Median Income</u> (1)	<u>Median Net Worth</u> (2)	<u>Ratio (2)/(1)</u> (3)
Under \$3,000	\$ 1,780	\$ 2,250	1.3
3,000 - 4,999	4,040	2,330	0.6
5,000 - 7,499	6,170	5,560	0.9
7,500 - 9,999	8,650	11,290	1.3
10,000 - 14,999	12,500 ¹	18,320	1.5
15,000 - 24,999	20,000 ¹	37,020	1.8
25,000 and Over	N. A.	455,900	N. A.

N. A.-- Not Available.

¹Estimated to be equal to the midpoints of the income class.

Sources: Column 1 -- Current Population Report, Series P-60, No. 41,
Table 3, p. 26.

Column 2 -- Survey of Financial Characteristics of Consumers,
Table A, pp. 96-97; also see appendix to this paper.

Table 3

Percentage Distribution of Families By Two Measures of
Economic Position, By Age of Family Head and Income, 1962

Income Size Class	Percentage of Families by Age of Head									
	Under 35		35 - 54		55 - 64		65 and Over		All	
	Income- Income (1)	Income- Net Worth (2)	Income- Income (3)	Income- Net Worth (4)	Income- Income (5)	Income- Net Worth (6)	Income- Income (7)	Income- Net Worth (8)	Income- Income (9)	Income- Net Worth (10)
Under \$3,000	17	17	13	12	19	15	47	32	20	17
3,000 - 4,999	23	23	16	14	18	14	23	15	19	16
5,000 - 7,499	34	32	27	22	25	16	14	23	27	24
7,500 - 9,999	16	16	20	18	16	19	6	9	17	16
10,000 - 14,999	8	9	17	22	15	20	6	12	13	17
15,000 - 24,999	1	2	5	9	6	11	3	6	4	7
25,000 and Over	0.2	0.4	1	3	1	5	1	4	1	3
Total	100	100	100	100	100	100	100	100	100	100

Notes:

1. Annuity value of net worth computed at a 10 percent rate of interest.
2. Columns may not sum to 100 because of roundings.

Source: Same as Table 1.

Table 4

Median Income, Median Net Worth, and Life Expectancy
of Families, By Age of Family Head, 1962

<u>Age of Family Head</u>	<u>Median Income</u> (1)	<u>Median Net Worth</u> (2)	<u>Ratio (2)/(1)</u> (3)	<u>Family Life Expectancy (Years)¹</u> (4)
Under 35	\$ 5,585	\$ 759	.14	49
35-54	6,918	7,664	1.11	34
55-64	6,219	13,210	2.12	21
65 and Over	3,204	9,719	3.03	11
All	\$ 5,956	\$ 8,329	1.40	

¹"Family life expectancy" is a weighted average of the life expectancies of husbands and wives at the mean age of the family head and on the assumption that wives are five years younger than their husbands. A weight of two-thirds is given to the additional years of life expectancy of the wife; this results from the assumption that widows will receive an annuity of two-thirds of the amount of the annuity previously received by the combined husband and wife unit.

Sources: Column 1 -- Current Population Survey, Series P-60, No. 41, Table 3, p. 26.

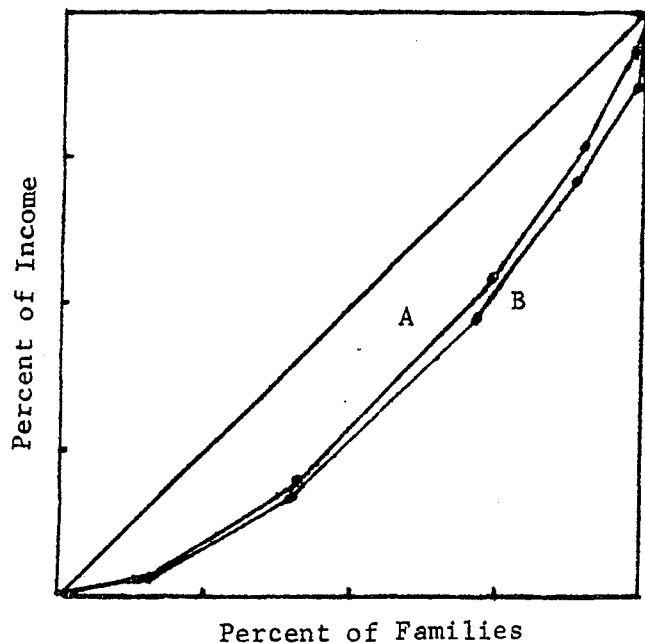
Column 2 -- Survey of Financial Characteristics of Consumers, Table A 1, pp. 96-97; also see Appendix to this paper.

Column 4 -- Based upon data from Vital Statistics of the United States, 1964, Vol. II, Part A, "Mortality," U. S. Public Health Service; see Appendix to this paper for method of calculation.

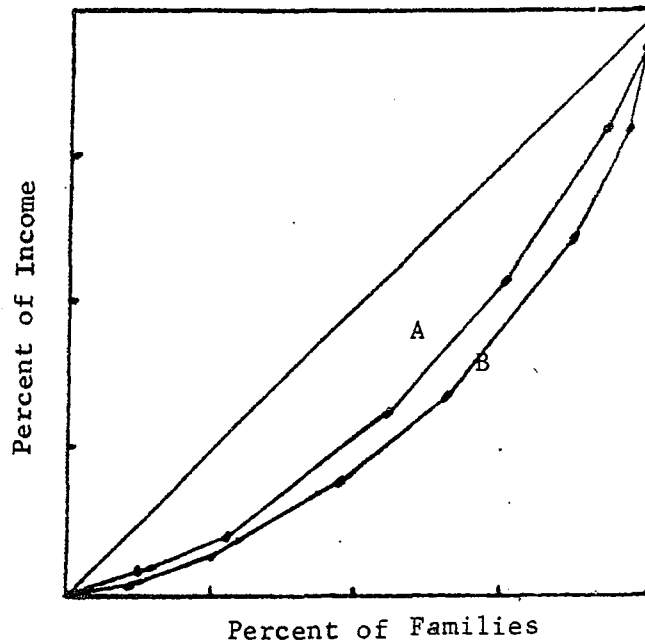
Figure 2

Lorenz Curves:
Percentage Shares of Money Income (A) and Income Net-Worth, At
a 10 Percent Interest Rate, (B)
Received By Families, By Age of Head, 1962

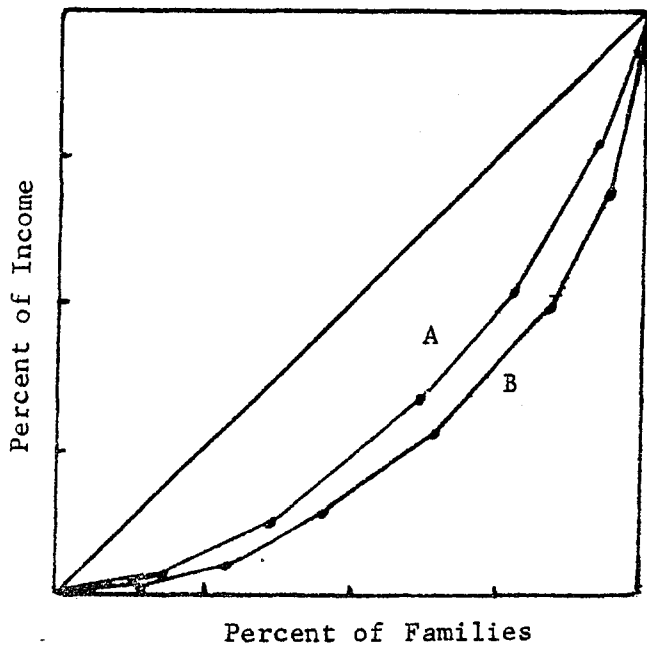
Age of Head Under 35



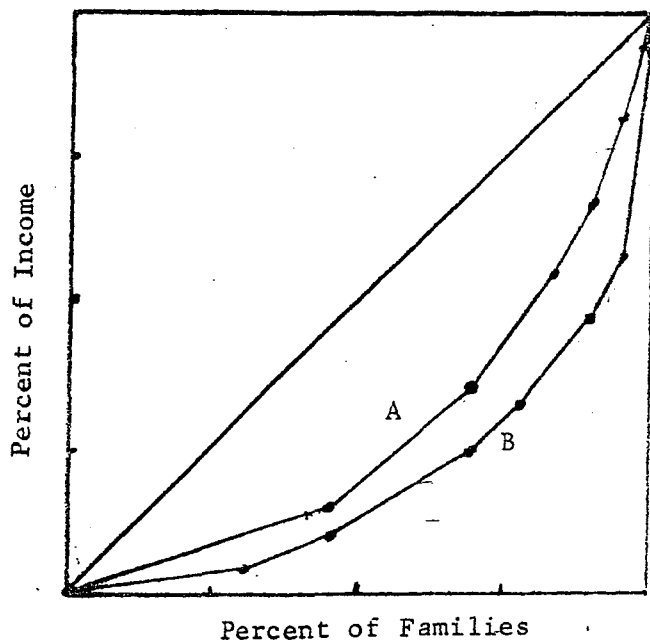
Age of Head 35-54



Age of Head 55-64



Age of Head 65 and Over



This section establishes that the distribution of economic position by the proposed measure differs from that shown by current money income because of differences among age groups in life expectancies and in the relationship between income and net worth.²¹ To further illustrate the usefulness of the new measure we now examine the extreme low and high ends of the distribution of economic position.

Implications for measurement of "poverty" and "affluence." What impact does our measure of economic position have on the magnitude and age distribution of "poverty" in the U. S.? In answering this question we shall define the poverty line for families as \$3,000 of current income, or, alternatively, as \$3,000 of income-net worth per family. Many objections could be raised to either of these measures, and indeed we pointed out at the beginning of this paper that an ideal measure of welfare would include many other variables. One especially important limitation to either of these measures is that they fail to distinguish among families of diverse size. Family size is important in looking at the amount and composition of poverty among age groups, since there is considerable variation in size by age of family head. As Orshansky has shown,²² the family size adjustment reduces the total number of poor families, though

²¹Were we to use a more comprehensive measure of economic position that included expected income as well as current income--as we have said earlier would be desirable--the picture of the age distribution of economic position would be altered further. In particular, since the incomes of younger people can be expected to rise, their economic position will be improved in the future. For older persons, however, the opposite will more likely be the case since, if anything, their expected income path is declining rather than rising. We are planning to examine the possibilities of incorporating expected income into our measure.

²²Orshansky, op. cit.

it leaves the total number of poor people unchanged. The reduction in the number of poor families is particularly great among those headed by persons over 65, since the average size of these families is relatively small.

Were data available to us on net worth by family size, we would have been able to make this kind of adjustment. In the absence of such data, we have used the now-antiquated \$3,000 poverty line. Our objective, in any case, is to emphasize not the absolute number of poor families but rather the changes in that number and in the age composition when net worth is considered in addition to income.

The effect of using income net worth rather than current income is shown in the top panel of Table 5. If current income is used alone to measure the extent of poverty, then--recognizing that no adjustment has been made for family size--Table 5 shows that 47 percent of the aged are "poor." When net worth is annuitized at a 4 percent rate the percentage falls to 36 percent, and to 32 percent at a 10 percent rate.²³ A glance up the columns shows, again, the decreasing effect of net worth as successively younger families are considered. Thus, the "poverty problem" appears to be much less a problem of the aged when net worth is taken into

²³A comparison of our results with those of Janet Murray, op. cit., can be made only for families aged 65 and over with annual money income less than \$3,000--for only these aged families were examined in her study. By our income-net worth concept and at a 4 percent interest rate, the number of aged poor is reduced by 23 percent, i.e., from 47 to 36 percent. The Social Security study also used a 4 percent interest rate, but employed two income measures: income with prorated assets excluding home, and income with prorated assets including home. The first measure reduced the number of the aged poor by only 11 percent; from 54 to 48 percent. When homes were included among prorated assets, the number was reduced by over one-third, from 54 percent to 35 percent, i.e., a total reduction of 35 percent. Differences in the underlying data as well as use of assets rather than net worth would appear to account for the difference in her results and those presented here.

Table 5

Numbers and Percentages of Families With Incomes
and Income-Net Worth of Less Than \$3,000 Per Year, and of
More Than \$10,000 Per Year, By Age of Head, 1962.

Less Than \$3,000 Per Year

<u>Age of Family Head</u>	<u>Families With Current Money Income Below \$3,000</u>		<u>Families With Current Income-Net Worth Below \$3,000, at</u>			
			<u>4 Percent Interest Rate</u>		<u>10 Percent Interest Rate</u>	
	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>
	(1)	(2)	(3)	(4)	(5)	(6)
Under 35	17	2.0	17	2.0	17	2.0
35-54	13	2.7	12	2.7	12	2.6
55-64	19	1.4	17	1.2	15	1.1
65 and Over	47	3.2	36	2.4	32	2.2
All	20	9.3	18	8.4	17	8.0

More Than \$10,000 Per Year

<u>Age of Family Head</u>	<u>Families With Current Money Income Over \$10,000</u>		<u>Families With Current Income-Net Worth Above \$10,000</u>			
			<u>4 Percent Interest Rate</u>		<u>10 Percent Interest Rate</u>	
	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>	<u>Percent of All Families in Age Group</u>	<u>Number of Families (Millions)</u>
	(1)	(2)	(3)	(4)	(5)	(6)
Under 35	9	1.1	10	1.2	11	1.3
35-54	24	5.1	29	6.1	34	7.2
55-64	22	1.6	30	2.2	36	2.6
65 and Over	9	0.6	16	1.0	21	1.4
All	18	8.3	23	10.5	27	12.5

Source: Same as Table 1.

account than is the case when current income alone is the criterion. Moreover, apart from the distribution of the "poor," the total number of "poor" families falls, from 20 percent--9.3 million families--to 17 percent--8.0 million families--when net worth is considered (at a 10 percent interest rate).

If we now look at the age distribution of poor families, we find that whereas the aged poor constituted 34 percent of all poor families by the current income measure, they comprise only 28 percent of all poor families according to the income-net worth measure. In absolute numbers, their total drops from 3.2 million to 2.2 million families. Consequently, the relative as well as the absolute number of the "aged poor" is substantially reduced. Again, the rising ratio of net worth to income with age, shown in the top panel of Table 6, coupled with the falling life expectancy, is of critical importance.

The question of how poverty should be measured for purposes of governmental policy remains open; it is certainly not resolved by our brief foray into the issue.²⁴ Illuminating, nonetheless, is the fact that the proposed income-net worth measure of economic position--by accounting for net worth and life expectancy as well as income--portrays a smaller magnitude of poverty, and a rather different age composition of the poor.

It might be argued that the more conventional measures of poverty, based on current income alone, have assumed implicitly some level of net worth holdings, or that they ought have made such an assumption. If the

²⁴For example, there is the issue of how prospective social insurance benefits, or more broadly the full range of public services, should be treated. But this topic has barely been opened up. We owe this point to Robert J. Lampman.

Table 6

Median Income and Median Net Worth of Families
With Incomes of Less Than \$3,000 Per Year and of
More Than \$10,000 Per Year,
By Age of Family Head, 1962

Less Than \$3,000 Per Year

<u>Age of Family Head</u>	<u>Median Net Worth (NW)</u>	<u>Median Income (Y)</u>	<u>Ratio NW/Y</u>
Under 35	\$ 0	\$ 1,782	0
35-54	385	1,760	.22
55-64	5,625	1,646	3.42
65 and Over	6,667	1,844	3.62
All	\$ 2,250	\$ 1,788	1.26

More Than \$10,000 Per Year

<u>Age of Family Head</u>	<u>Median Net Worth</u>	<u>Median Income</u>	<u>Ratio NW/Y</u>
Under 35	\$ 7,634	\$ 12,969	.59
35-54	20,349	13,449	1.51
55-64	35,524	12,420	2.86
65 and Over	45,800	14,084	3.25
All	\$ 21,714	\$ 13,454	1.61

Source: Same as Table 4.

income-net worth measure is viewed as useful, the question still remains as to what level of income-net worth should be regarded as a poverty line for purposes of measurement or eligibility for public programs.

It seems reasonable that the "official" measures of poverty adopted by the U. S. Office of Economic Opportunity, which consider current income and family size, could be extended to encompass net worth as well. Indeed, something very similar to this has already been implemented by the College Scholarship Service which, in determining the eligibility of college students for financial aid--from both private and public sources--relies upon family net worth data in addition to current income and family size. The 1966 Survey of Economic Opportunity (SEO) makes this approach applicable to a more general class of decisions regarding "poor" or "needy" people, for it provides extensive data on the net worth of low income families by family size.

Turning briefly from the poor to the "affluent," we see in the bottom panel of Table 5 what effect consideration of the annuity value of net worth has on the upper end of the distribution of economic position. Considering money income only, 18 percent of U. S. families, or 8.3 families, were over the \$10,000 mark; but this rises to 27 percent--12.5 million families--when net worth is annuitized at a 10 percent rate of interest. And, as with the low end of the distribution, the effect of considering net worth is markedly age-specific.

Implications for defining tax progressivity and regressivity. The income-net worth measure may be viewed as an alternative standard for viewing whether a given tax is "really" regressive, progressive, or proportional. We suggest that the ratio of taxes paid to current income may be a less useful standard for assessing vertical tax equity than is the

ratio of taxes paid to income-net worth.

When net worth is considered in addition to income--in the manner we propose--the progressivity or regressivity of the tax system with respect to particular groupings of people will change in a systematic way. The essential reason for this is, as we have discussed above, that the ratio of income to income-net worth is not the same, either among income classes within age groups, or among age groups. Within any age group the use of the income-net worth base will show any tax, or the tax system as a whole, to be less progressive or more regressive, as the case may be, than if the conventional income base is used. This results from the fact that the ratio of net worth to income rises with respect to income. Similarly, the use of the income-net worth base will show any given tax to fall less heavily upon aged people than upon younger people. This results from the rising ratio of net worth to income with respect to age, and from the decline of life expectancy with respect to age. Both of these factors are captured in the proposed income-net worth measure but not in the current income base.

These illustrations can be generalized as follows. The net effect of the (1) rising ratio of net worth to income over the life cycle, (2) decreasing life expectancy over the life cycle, and (3) rise and then decline of income over the life cycle, will determine the precise dimensions of shifts in progressivity or regressivity by the income-net worth measure relative to that indicated by the use of current income alone. It is clear, however, that the picture of how our tax burdens are related to "ability to pay" is very different when our more comprehensive measure of "ability"

is used. The exact form and magnitude of these shifts deserve further study.²⁵

Consumption behavior estimation. The approach presented in this paper for measuring economic position may be applied fruitfully to the prediction of consumer behavior. Indeed, any measure of economic position would seem to imply a theory of behavior--and vice versa. Thus, if economic position is a function of annuitized net worth as well as current income, then we might expect consumer expenditure levels also to depend on these factors.

Consider, for example, the relationship between the level of consumer expenditures in a given time period, and the level of permanent income, or alternatively, the level of windfall income in that period. Employing our income-net worth approach we suggest that the MPC out of permanent income should be higher, in general, than the MPC out of windfall income--and that the difference should narrow with age.

The reasoning is as follows: an increment of windfall income may be viewed as, in effect, a lump sum transfer of net worth (simply assets in this case). As such, its effect on current consumption expenditures would tend to be determined not by the size of the capital transfer but by its annual lifetime annuity value. Given the size of the capital transfer and the interest rate, the annuity value will depend on the life expectancy of the recipient, and, hence, will vary inversely with the recipient's age. In all but the limiting case in which life expectancy does not extend beyond

²⁵The relevance of net assets to the "regressivity" of the sales tax has been discussed by Harold M. Somers in a statement prepared for the Joint Economic Committee (Tax Changes for Shortrun Stabilization, Hearings before the Subcommittee on Fiscal Policy, 89th Congress, Second Session, March 1966, pp. 100-106).

the current period, the annuity value will be less than the capital value. Thus, even if the recipient's MPC with respect to annuity income were unity, the observed MPC with respect to the capital value would be less than unity, and would be smaller the younger is the recipient.

It is interesting to note that this testable prediction is similar to that arrived at by Modigliani-Brumberg-Ando and others.²⁶ While they started with the objective of predicting consumption behavior, their work implies a measure of economic position--namely, that economic position at a point in time is the sum of net worth plus the present value of expected income, divided by the length of expected life. We on the other hand started with the objective of measuring economic position, but some of the implications of the measure for consumption patterns became apparent as our work progressed. It is to be hoped that in the future closer rapport will develop between researchers concerned with measures of economic welfare and those concerned with the theory of economic behavior.

IV. Conclusions

The income-net worth measure proposed here, while incomplete, has a number of useful attributes, the major one being that of merging two disparate but obviously related measures of economic position into a unified measure. The most striking result is its impact on the economic position

²⁶Franco Modigliani and R. E. Brumberg, "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data," in K. K. Kurihara, ed., Post-Keynesian Economics, New Brunswick, N. J., 1954, pp. 388-436; A. Ando and Franco Modigliani, "The 'Life Cycle' Hypothesis of Saving: Aggregate Implications and Tests," American Economic Review, LIII (March, 1963), pp. 55-84, and references cited therein.

of the aged, who by this measure appear to be considerably "better off" than is shown by the current income measure. This results from the interaction of income, net worth holdings, and life expectancy. In addition to questions about the distribution of economic position, the income-net worth measure may be useful as a basis for redefining tax progressivity and regressivity, and as an explanatory variable in consumption behavior studies. Finally, it seems apparent that the measurement of economic welfare and the prediction of economic behavior are really two sides of the same coin, and that more explicit recognition of this fact would enrich the work in both areas.