Part 3

PROCEEDINGS

Agricultural Economics Seminar

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AN ECONOMIC DEFINITION OF POVERTY

By

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Introduction

This note presents a consistent, relatively operational and, in
my judgment, a thoroughly adequate definition of poverty   It has been
constructed with a view both to the vernacular understanding of the
condition of being poor and to the needs of antipoverty policy-makers
and administrators for an explicit objective to guide their efforts

The concept developed here takes from the basic model of economic
choice the idea of separating preferences from constraints   Associating
poverty with extremely limited constraints, the definition incorporates
a broader concept of the economic constraint derived from Milton Friedman s
theory of permanent income   Consideration also is given to the problem
of weighting and aggregating varying degrees of poverty and to the
notion of a Social Welfare Function

The neoclassical model of economic choice

This very simple analytical tool provides a framework for analyzing
the behavior of decision-making economic units   Its flexibility permits
application to consuming units or producing units of varying levels of
complexity   The consuming units with which we are immediately concerned
are the individual and the family

Stated most simply, the model postulates that there is a set of
objects of choice which the decision-maker ranks according to his
particular, and perhaps peculiar, preferences   Confronted with one
or more considerations which limit his choice to a sub-set of these
objects, the decision-maker will, according to the model, choose the
highest ranking alternative available in that sub-set   For example,
a family may prefer a suburban bungalow to a high-rise apartment,
which in turn is favored over a walk-up flat, and all three are re-
garded as better than remaining in (or returning to) a rural tar-paper
shack   If it is limited by income or discrimination to either the
flat or the shack, however, it will choose the former   This is,
loosely speaking, the extent of the rationality assumption which is
so often invidiously used as a club with which to beat economists   It

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is possible, of course, to make more restrictive assumptions, and to get more substantial derivative propositions from the theory But these are not necessary in general, nor are they needed for the development of the concept that follows

In more specific terms, consider the set of choice objects all to be possible rates of consumption of two categories of consumer goods and services: necessities and luxuries   (We may indulge in the abstraction that there are only two goods, measured in some convenient scale, and each good perfectly divisible, so that amounts can be varied in a continuous manner) The decision-making unit, which we may take to be an individual or a family, has a system of preference among these objects that may be represented by an "indifference map" imposed on a two-dimensional space as in Figure 1   Each point in the positive quadrant corresponds to a unique combination of luxury and necessity consumption   The point A in Figure 1 corresponds to consumption of X units of necessities and Y units of luxuries per month   Each curved line consists of points that are considered equally good by the family   (There is such a line through every point-- only a few representatives are drawn.) Points to the northeast of any one curve are all preferred over points on or to the southwest of the same curve.   In this manner a system of indifference curves can describe completely a particular ranking; any pair of consumption levels on two-dimensional points on the diagram can be evaluated as better, worse, or equally good, compared to any other pair.

This system of preferences is regarded as a characteristic of a particular individual and may be quite different for some other individual.   The preference ordering represents the tasts, values, and knowledge possessed by the individual--they will reflect his culture,   As such the preferences are not immutable, but, like culture, they are treated as stable enough to make worthwhile the abstraction that they remain constant for analytical purposes.

Figure 1
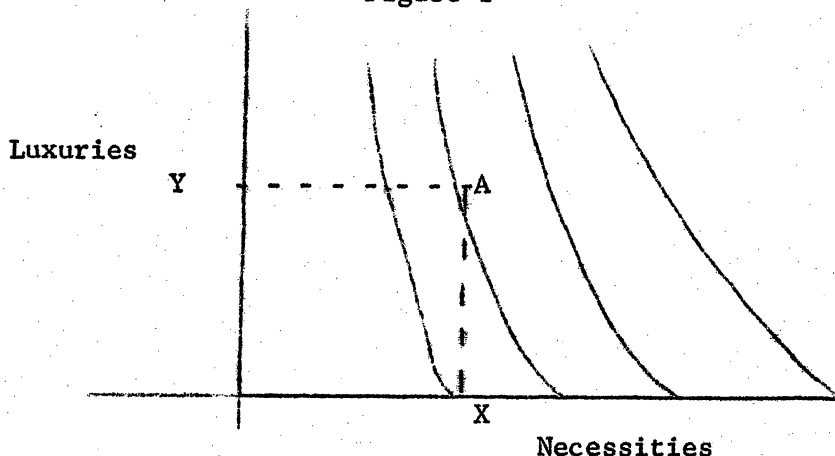
Given these preferences, now consider which combinations are available to the decision-maker. Assume that he has a fixed income flow to be spent and can purchase any amount of each good at prices that do not depend upon the size of his purchase. We may now draw a straight line, PP', that divides the space into a portion that he can afford and one that he cannot, as shown in Figure 2. The point P on the vertical axis is simply the number of luxury units that could be bought if the entire income were spent on luxuries; P' is similarly derived from income and the price per unit of necessities. The model is now cimplete, and indicates that a family with preferences as shown, faced with a budget limit and prices as drawn, would choose to consume necessities at rate A and luxuries at rate B.

The external and relatively objective factors that determine the available alternatives are usually regarded as subject to variation. For example, an increase in income would shift the constraint outward in a parallel manner and, as drawn, would lead to increased purchases of both commodities. A change in relative prices will rotate the constraint and thus alter the level of purchases. Usually an increase in price of one good will, other things remaining constant, result in a reduction of consumption of that good.

Figure 2
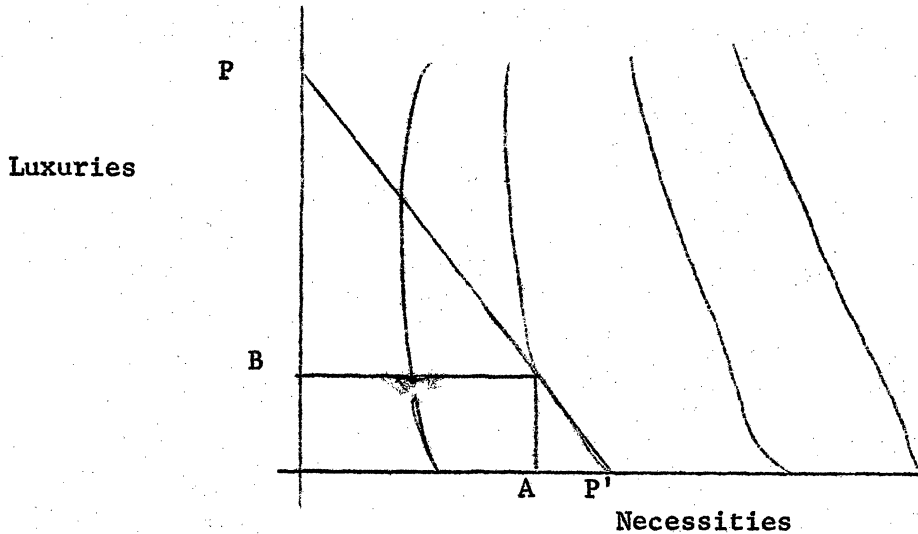
Poverty and affluence as degrees of constraint on choice

The above excursion into basic economic theory was made to lay a foundation for the concept of poverty. The distinction made between preferences and constraints provides a useful basis for limiting the notion of poverty to the relatively objective constraint side of the problem. Poverty is, in this view, a property of the individual's situation, rather than a characteristic of the individual or of his pattern of behavior. Of course, overt behavior or ex post facto choices will reflect both preferences and constraints--both values or culture and situation--but poverty is associated solely with severe constriction of the hoice set. Similarly, affluence cor-respoinds to a much larger area of attainable alternatives. Indeed, poverty and affluence are, in this view, the names we give to the two ends of a scale measuring level of generalized command over real goods and services. Current income is an important part of this command over goods and services, but it is not, as will be argued below, the sole determinant.

There are two features of a definition based on the choice con-straint which recommend it to economists (at least to this one). First, it avoids imposing a norm on the tastes and values held by individual decision-makers. Instead of arguing that anyone who consumes less than X units of food or Y units of housing is poor, it would argue that anyone who has sufficient command over goods and services to achieve X and Y simultaneously must be at least as well off if he actually chooses some other combination.

It is, of course, a value judgment on the part of economists that the diversity of tastes and values that are reflected in different allocations of consumption at the same level of general command ought to be respected. Accordingly, the fact that a particular family allocates a given budget in a way contrary to a (typically middle-class) outsider's notion of how he would do it, or at variance with some statistical average of families at a comparable budget level, should not be taken as evidence that the family is worse off or poorer.

The second salutary feature of this definition pertains to the elimination of troublesome questions about the level of satisfaction or happiness achieved by particular families from a given budget. The theory of choice requires only a ranking of alternatives; it does not require any measure of the magnitude or intensity of the dis-tinctions made in rank, nor does it require any absolute measure of the pleasure derived from a particular allocation. Economics, and as far as I know, social science in general, cannot contrive a measure of satisfaction that would make one comfortable about assert-ing that Mr. A., with very aristocratic tastes and only two Picasso's does not feel more deprivation from want of a third than does Mr. B.,

who hasn't been able to buy shoes for the last three years. Lacking such a measure and possessing egalitarian tendencies, one is attracted to a definition of poverty that focuses on the means for pursuit of happiness rather than on happiness itself.

Generalized command over goods and services

The current practice of measuring the extent of poverty according to levels of money income can be construed as a choice of a constraint-oriented poverty concept, as recommended above, combined with a choice of current annual money income as the measure of command over goods and services. Probably everyone remotely connected with developing and working with these statistics has acknowledged the crudity of this measure. But, if the argument in favor of a constraint-oriented measure is accepted, then it follows that improvement lies in adopting a more comprehensive measure of the constraint on household choice. The income measure is crude because of its incomplete coverage of sources of command over goods and services and its short time horizon-- not because it is narrowly economic, lacking in humanity or oblivious to subjective subtleties. The following paragraphs indicate how the measure can and should be broadened both on conceptual and on empirical levels of analysis.

The economic literature contains a concept of income that comes very close to meeting the present need for a comprehensive measure of command over goods and services. Milton Friedman's permanent income concept has proved useful both in clarifying theoretical analysis of household behavior and in improving our ability to predict behavior. The value of the largest sustainable level of consumption is one, slightly circular, way of describing Friendman's more comprehensive concept. More precisely, it is the sum of income flows from property, from sale of labor services, and from transfers (unilateral "gifts") from other persons or from governmental units, whether received in money or in "real" form. These flows are evaluated at the normal rate that they can be expected to maintain over the long-run instead of at the current level. The reason for this is that current income may be higher or lower than normal because of temporary good fortune or misfortune. Friedman terms these deviations "transitory income," which, together with "permanent income," divides current income receipts into two additive components.

Expansion of the time horizon for purposes of measuring income broadens the concept substantially. As developed by Friedman, there are two bases for income via the market--Human Wealth and Non-human Wealth. The latter is relatively familiar owing to its similarity to wealth in common usage--real and financial property. Money income from this source is usually counted in current measures, although year-to-year variation in profits or dividends may exaggerate the dispersion of the income distribution. However, it is not common to consider the wealth itself, as distinct from the income it generates,

as a part of a household's command over goods and services. But, considering that households do accumulate wealth with the intent of de-cumulating it during retirement (or passing it on to succeeding generations), it would seem appropriate to convert net wealth (assets minus liabilities) into equivalent life annuities, for purposes of measuring the capacity to sustain a level of consumption. This modification would primarily affect the aged or near-aged family units.

An important example arises from the directly consumed services of owner-occupied housing. The value of such services is, conceptually speaking, a form of income, and is no less worthy of inclusion because the income does not accrue in money. The income will be appropriately accounted for if owner-occupied housing is included among the assets used in the net wealth calculation discussed above. It is mentioned here only because of the ubiquitousness of home ownership and because it is easily overlooked.

The notion of human wealth is a major improvement on current earnings as a measure of command over goods and services. The effective capacity to earn money income by selling labor services in the market, or to produce directly consumed services in the home, is the second component of permanent income. As compared with current earnings, it both takes into account a longer period of time and incorporates real income as well as money income. The longer period tends to substitute average rates of unemployment for intermittent full and zero levels of employment. It also offsets the quite low levels of current income usually enjoyed by those who are adding to their stock of capital by education or training.

In terms of this broader concept, an unemployed dishwasher would be counted as poorer than an unemployed plumber, even though both had the same zero level of current earnings. A Negro assembly-line worker who currently earns the same wage as the white worker at his side would be credited with a smaller long run command over goods and services by being subject to a higher risk of future unemployment.

Another feature of the generalized measure of human wealth is its ability to include the home-produced and - consumed services of the homemaker and other adult family members. The conventions of income taxation and national income accounts do not give explicit recognition to this source of income. The anomaly has been pointed out with respect to the national income accounts but, in the absence of any threat of drastic changes in human nesting patterns, it has not been regarded as an important weakness. When making inter-family comparisons, particularly at income levels where nesting patterns frequently diverge from the ideal nuclear family, however, it is quite indefensible to ignore the direct contributions of adult family members to the services, or even goods, available to the family.

Finally, there are transfer payments among persons. These may be entirely voluntary, as within a family; or be covered by contract, as in the case of alimony; or arise out of public programs, such as Social Security. Persons are able to obtain command over goods and services in such ways without a current quid pro quo. Insofar as these claims are secure, either through law or though convention, there is no reason to treat them as different from income that accrues to human or non-human wealth.

There are, of course, substantial problems involved in measuring "permanent income." But, if it is possible to obtain some general agreement on the suitability of the concept for analysis of poverty, there are many possibilities for improving on the measures now in use. Furthermore, if, as I believe, the generalized concept is relatively free of many weaknesses that have been criticized in the current money income concept, then it may be possible for a wider range of analysts to work within a common conceptual framework.

The index of poverty

The preceding discussion has argued that a measure of poverty should be related to the individual's or family's "permanent" level of command ovlr goods and services. There remains the problem of specifying standards of comparison that will permit evaluation of commensurate degrees of poverty for families of different size or composition, in different places, and at different times. The "poverty lines" now in use are intended to provide such standards for annual money income. The Orshansky thresholds vary according to family size, they have been adjusted for changes in the consumer price index for intertemporal comparisons, and they allow for differences between farm and nonfarm residence.

In the simplest terms, the poverty lines represent the level of income that divides the families of a particular size, place, and time into the poor and the non-poor. Hence the set of poverty lines are intended to designate equivalent levels of deprivation. Similar thresholds could be obtained for the more comprehensive constraint measures presented above, and these, again, could be used to divide the population into poor and non-poor.

However, it has been argued above that poverty is not really a discrete condition. One does not immediately acquire or shed the afflictions we associate with the notion of poverty by crossing any particular income line. The constriction of choice becomes progressively more damaging in a continuous manner. As a first step it would seem appropriate to maintain the graduation provided by a continuum but to seek a scale along which differently situated families can be

compared. For this purpose a ratio of the measure of permanent income to the poverty threshold might be taken as a first approximation. Symbolically, let Y(N,L,t) denote the poverty threshold for a family of size $\underline{N}$, in place $\underline{L}$, at time $\underline{t}$. Define a family's "welfare ration" $\underline{w}$ as the ratio of its permanent income, $\underline{Y}$, to the appropriate poverty threshold, i.e.,

$$w = Y/\hat{Y}(N,L,t).$$

This scale extends the notion of equivalence <u>at</u> the poverty thresholds to equivalence at any proportional distance <u>from</u> the poverty thresholds, e.g., 15 percent below.

This welfare ratio will, of course, permit the same bifurcation into poor and non-poor, the latter having ratios greater than one and the former less than one. But it also preserves the notion that those who are 5 percent above the threshold are not much better off than those who are 5 percent below. The welfare ratio also leads into consideration of more sophisticated ways of aggregating the detailed data into one-dimensional measures of the nation's poverty problem.

The "nose count" in poverty is one such measure, but it has little but its simplicity to recommend it. The "dollar gap," or the total amount by which the incomes of the poor fall short of the poverty lines, is a somewhat better measure, because it counts a family which is at half the poverty line as five times as severe a problem as one which is at 90 percent of the same line. A further improvement would recognize that poverty becomes more severe at an increasing rate as successive decrements of income are considered; in other words, that poverty is reduced more by adding $500 to a family's command over goods and services if the family is at 50 percent of the poverty line than if it is at 75 percent.

A simple and mathematically tractable measure which has this property would be the logarithm of the welfare index. It is not, by any means, the only such scale, but it offers a definite improvement over the current practice. The logarithmic function, as shown in Figure 3, takes on negative values for fractional welfare ratios (incomes below poverty) and positive values for ratios greater than one. For purposes of more aggregative measures of poverty it would be appropriate to sum the logarithms of welfare ratios, weighted by family size, over some part or all of the lower half of the distribution of families, i.e.,
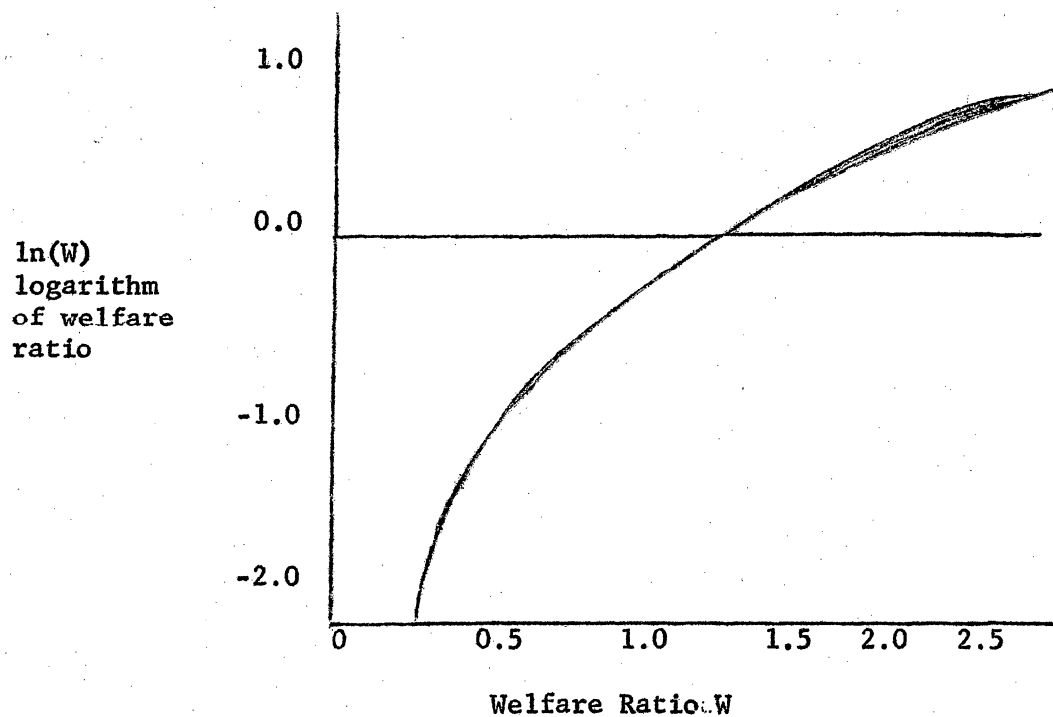
$$P - \sum N_i \ln(W_i),$$

$$i \epsilon L$$

where L is the set of subscripts belonging to families with W $\_$ W* $\_$

median W, N_i is the ith family size, and W_i is the ith family's
welfare ratio; $\ln(x)$ denotes the logarithm of any (positive) number X.

Figure 3

Welfare Ratio W

If W* = 1 then P cannot take on positive values. It would have
a limiting value of zero if no one were below the pov erty line. The
more severe is poverty, according to this scale, the more negative is
the value of P. For W* $\rightarrow$ 1, P could take on positive values and
could do so even though some families remained below the poverty line.
However, in both cases an objective of maximizing P would provide a
tenable guide to policy formation.

It would be possible to use some old and honorable terminology
to add further perspective to the measure proposed here. Without
doing excessive violence to the ideas of the utilitarians, one could
specify an over-all utility function for society as the sum of all
welfare ratios:

$$U = \sum N_i \ln(W_i).$$

all i

This magnitude could be broken into two parts:

$$P = \sum_{i \in L} N_i \ln(W_i)$$

where L is the set of subscripts for families with W _ 1,

$$A = \sum_{i \in L} N_i \ln(W_i)$$

$$U = P + A$$

Here P will be a negative number (unless there are no poor) and could be interpreted as the disutility suffered by society because of poverty. A will be positive and could be termed the affluence level of society, part of which is "wasted" as an offset to P in the calculation of total utility.

It should be explicitly noted that the interpretation discussed above incorporates a fairly radical form of egalitarian value bias. It assumes that, except for the adjustment introduced in defining $\underline{W}$ (family size, location, etc.), all persons have equal needs; and that, other things being equal, including total output of goods and services, society would attain its highest satisfaction from an absolutely equal distribution of incomes. No positive value is attached to dispersion of the income distribution even for the sheer delight of variety. Practically speaking, there is a relation between total output and income dispersion that would almost certainly prevent complete equality from being an optimal or even an attainable solution.

Regarding P as simply an objective function, it is useful to consider how it would tend to allocate effort among the various levels of income. The derivative of P with respect to the welfare ratio of a particular family is an indicator of the relative importance of increasing that family's welfare ratio. That derivative for the logarithmic function is:

$$\frac{\partial P}{\partial W} = \frac{N_i}{W_i}$$

for all families with W_i W* (=0 otherwise). Hence for a family of four at half of the poverty line the derivative is 8 = 4 $\div$ 0.5. Compared to a family of four only .20 percent below the poverty line which would have a derivative of 5 = 4 $\div$ 0.8, it is seen to be 60 percent more important to raise the welfare ratio of the former. It would be preferable to promote an increase in welfare for the poorer family unless it were 60 percent more expensive to do so.

It appears to many that calculations of the sort carried out above are symptomatic of an extreme insensitivity to human values. How can one justify the contention that is it costs too much, where too much is given a definite numerical vlue, it would be better to forsake the poorer family and help the less poor one? The simplest, and least invidious, answer is a pragmatic one. If the 8:5 ratio doesn't seem right, we can specify a function that will make it, say, 100:1; but at some point, with limited budgets for fighting poverty, choices of this sort have to be made. They <u>cannot</u> be made more sensibly by refusing to look at the distri utional implications. An economist draws very little satisfaction from engaging in inter-personal comparisons which, according to his training, cannot be grounded in objective fact, but must be plainly labeled as value judgments. He cannot profess any expertise in making such judgments, but he can and must insist that such judgments be made explicit, both to promote democratic debate and to permit consistent analysis and choice of policy alternatives.

A poverty function of the sort displayed above should be carefully distinguished from an over-all social welfare function. The former is at best appropriate for guiding the choices of an agency charged with eliminating poverty. For choices that have to be made at the presidential level, a much larger set of national objectives, inevitably conflicting at the margin, have to be balanced against each other. The poverty level should be one of these, but so should the affluence level, national security, mental health, and at least several others.

Finally, it should not be assumed that, because the poverty index depends solely upon the level of command over goods and services, the optimal means of reducing poverty must be to increase that level as directly and as immediately as possible--e.g., to hand out money or public jobs. There is nothing in the definition that prevents Head Start or even prenatal nutrition from being the most efficient means of reducing poverty in the sense of amount of poverty reduced per dollar spent. Some kinds of direct transfers would almost surely be among the least efficient.

There are additional problems, not directly addressed in this paper, concerning the comparison and summation of poverty reductions and costs of programs that are distributed through time. These problems are at least as complex as the ones dealt with above, and are equally burdened with value judgments.

Concluding remarks

The concept of poverty that is developed above is restrictive, both in the sense that any specific concept must be restrictive, and in the sense that it excludes from consideration many social, political, psychological, and physical ills that are weakly or strongly associated with poverty. This does not indicate a presumption that these other problems are unimportant--their reduction should be among our national goals. Rather, it is presumed that poverty is a specific ill in itself; that poor people, while they share many other problems with the non-poor, are unique in having a relative shortage of goods and services at their disposal; and that, finally, poverty in the more restricted sense can be eliminated, is worth eliminating--both for its inherent injustice and for its fallout effects on correlated problems--and will be eliminated more promptly by policies which are aimed at a compact, rather than a diffuse, target.