

Measuring Poverty: Issues and Approaches

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Formal measurement of poverty in the United States is less than three decades old. Not since the adoption of official poverty thresholds by the federal government in the late 1960's has there been such a great interest as now in examining and possibly respecifying the thresholds. This paper first briefly describes the origins and basis of the official thresholds. Then, it discusses in some detail some of the more current issues that must be addressed to bring the thresholds up-to-date. The final section discusses a recent effort to propose a comprehensive alternate approach.

I. History

The official poverty thresholds in use today by the U.S. Bureau of the Census to measure poverty have their basis in work by Orshansky (1963, 1965). At that time, the major attempt to quantify the number and distribution of the poor had been tabulations published from the 1960 Census, and several reports in the 1960's from the Current Population Survey (CPS) that indicated the number of families with incomes below \$3,000 and unrelated individuals with incomes below \$1,500 (see U.S. Bureau of the Census, 1965, 1969).

The key problem with the concept used in the Census and CPS tabulations was that both small and large families with, for example, \$2,900 in income were assumed to be poor. Further there was no explicit relationship to any measure of need. In contrast, Orshansky's method had thresholds that increased with family size so that larger families needed more income than smaller ones to be out of poverty.

Orshansky started with a set of minimally adequate food budgets calculated for families of various sizes and composition by the U.S. Department of Agriculture for 1961. Based on evidence from the 1955 Household Food Consumption Survey, she determined that food represented about one-third of after-tax income for the typical family. This relationship yielded a "multiplier" of three, that is, the minimally-adequate food budgets were multiplied by a factor of three to obtain 124 poverty thresholds that differed by family size, number of children, age and sex of head, and farm or nonfarm residence (adjustments were made for families of size one and two). One reason these proposed thresholds were viewed as reasonable was because the threshold that resulted for a family of four (close to the median family size at the time) was \$3,130, close to the \$3,000 figure used in the 1960 Census tabulations and the 1965 CPS publication.

As President Lyndon Johnson's "War on Poverty" was just beginning and there was a great interest in measuring its progress, Orshansky's measure of poverty was widely used by policy makers at the Council of Economic Advisors and other researchers. Attempts to update the poverty scale to account for inflation in the 1960's used increases in the price of food to inflate the minimal food budget, maintaining the multiplier of three. In 1969, the U.S. Bureau of the Budget (now the Office of Management and Budget) adopted the Orshansky measure as a standard government poverty measure, mandating that inflation be measured using the Consumer Price Index (CPI) published by the U.S. Bureau of Labor Statistics (BLS). With only minor modifications since then (mostly reducing the number of categories, now 48), the Orshansky thresholds still form the basis for the official poverty statistics.¹

The U.S. Bureau of the Census publishes statistics annually using the CPS, a household survey of roughly 60,000 households conducted monthly mainly to determine the Nation's unemployment rate. The annual March Demographic Supplement provides the income data necessary to determine poverty statistics. Official poverty rates show a steady decline from 1959 to 1973, decreasing from 22.4 percent to 11.1 percent.² The poverty rate remained at roughly that level until 1978. From 1978 to 1983, the poverty rate increased by roughly one-third, rising from 11.4 percent to 15.2 percent. From 1983 to 1989, the poverty rate declined, reaching 12.8 percent in 1989. The peak since then was 15.1 percent in 1993, declining to 14.5 percent in 1994 (U.S. Bureau of the Census, 1995).

II. Current Issues

Serious examinations of the poverty thresholds were undertaken in 1969, 1976, 1980, 1990, and 1995. One of the most thorough was the work of the 1976 government task force. Their findings (and 17 background working papers) were published in a series of volumes called *The Measure of Poverty* (U.S. Department of Health and Human Services, 1976). Some minor changes in measurement methodology resulted, but there was no wholesale redefinition. The 1990 interagency task force had a mandate much less broad than the 1976 group, and developed a draft research agenda and recommendations that would review current and alternative measures of income and poverty.³ The most recent is an examination of the poverty concept by the Committee on National Statistics of the National Academy of Sciences, at Congressional request and funded by the U.S.

Bureau of the Census, the U.S. Bureau of Labor Statistics, and the Administration for Children and Families in the U.S. Department of Health and Human Services. Their recent report will be discussed in detail in Section III. When considering the adequacy of the official poverty thresholds, it is critical to realize that one cannot separate the issue of income measurement from poverty definition. When one defines the level of resources needed to be non-poor, one must also determine which resources are to be counted. Therefore, the discussion below covers both income measurement and poverty definition issues. Also critical to the definition of poverty is whether to use an absolute or relative measure. A relative measure sets the poverty standard at a fixed fraction, say 50 percent, of some measure of the population's well-being such as median family income. Thus, under a relative poverty measure, only if the incomes for the families at the bottom of the income distribution improve relative to the rest of the distribution would poverty decline. In 1965 in the U.S., the poverty threshold for a family of four was 45.0 percent of median income; by 1989 this percentage had fallen to 37.0 percent (and was 28.9 percent for a family of three).⁴ By 1994, the percentages had returned roughly to its 1965 level -- 46.9 percent for a family of four (and 36.6 percent for a family of three).

The alternate method of measuring poverty and the one currently in use in the U.S., at least in theory, is more or less an absolute measure (using Orshansky's phrase, "relatively absolute"). When constructing an absolute measure, one attempts to measure the minimal consumption levels of as many goods as possible. The cost of that consumption bundle is then increased to account for necessary goods not included by use of a "multiplier." Orshansky measured only the cost of a minimally adequate diet. Other proposals have suggested adding shelter, clothing, and medical care to the list. I restrict our discussion here to absolute measures; most observers expect the U.S. poverty concept to retain this feature.

I should point out that in reality the poverty thresholds chosen are ultimately arbitrary--reasonable social scientists and politicians will always disagree about their appropriate levels. Yet it is my belief that whatever level is chosen, it should be the result of a carefully specified process that cannot be changed arbitrarily from year-to-year, and should be capable of being updated at reasonable intervals as the economic circumstances of the society and the behavior of its demographic and economic components change. If such a method is adopted, the level itself will be less important--it is the changes from year to year and the comparisons among demographic groups that should matter for policy makers.

A. Income Measurement

The key income measurement issues for the U.S. are three:

1. valuing non-cash income,
2. measuring disposable income (the role of taxes), and
3. reducing survey underreporting and nonsampling errors.

Two other income issues also addressed below are the choice of appropriate measure of resources (the role of wealth and consumption-based measures) and the measurement of nonmarket income. Also of interest is whether to continue to publish official estimates based on the CPS or switch to a newer survey designed to collect better income information, the Survey of Income and Program Participation (SIPP).

A.1. Noncash income

The issue of valuing noncash income spans the income distribution. A more comprehensive income measure would place a value not only on noncash government transfers, such as food stamps (coupons used as cash for qualified food purchases), which typically go to low-income families, but also on elements of nonwage compensation (from employer-provided health insurance to company cars) that typically go to earners at all income levels.

Noncash income to U.S. families has grown substantially in the past 25 years. In the 1980's, over half of government transfer spending for the poor was in the form of noncash benefits (U.S. Bureau of the Census, 1995). This growth of benefits to the poor has been paralleled by a growth of nonwage compensation to wage earners, induced in part by tax laws exempting such compensation from income and payroll taxes. By 1990, employer costs for nonwage compensation had grown to over one-quarter (27.6 percent) of total compensation costs, up from 19.4 percent in 1966.⁵ Further, 64 percent of families and unrelated individuals own homes, which provide them with additional noncash income in the form of housing services.

The Census Bureau began publishing estimates of the value of many of these noncash benefits in 1982 (the latest is U.S. Bureau of the Census, 1995). This experimental series values food, housing, and medical government transfer benefits, and also employer-provided health insurance. Each of these areas needs further developmental work to improve measurement methods. Currently food stamps are valued at their coupon value, that is, their full dollar value. This appears widely acceptable as research shows recipients are unconstrained in their food choices by the requirement to use coupons. The value of public and subsidized housing is assigned through a crude imputation methodology involving a statistical match between the CPS and the American Housing Survey (AHS).

Of key concern to understanding well-being is the valuation of medical benefits, both the government health programs--Medicare (medical aid to the elderly) and Medicaid (medical aid to the poor)--and employer-provided

health insurance. The valuation of medical benefits is particularly difficult since coverage of high medical expenses for someone who is sick does nothing to improve his or her poverty status (although the benefits clearly make him or her better off). Even if one imputes the value of an equivalent insurance policy to program participants, these benefits (high in market value due to large medical costs for the fraction who do get sick) cannot be used by the recipients to meet other needs of daily living. Accordingly, the Census Bureau developed a not-altogether-satisfactory method, termed fungible value, to avoid giving too high a value of these benefits to those at the low end of the income scale.⁶

Because these medical programs are so large, coming up with a better measure of the value of medical benefits or a better way of accounting for the presence of adequate health insurance should be high priority. Ellwood and Summers (U.S. Bureau of the Census, 1986) argue that there is little theoretical foundation for including medical benefits as income, but then not adjusting income for other medical expenditures such as insurance premium costs for those that must buy their own insurance and out-of-pocket expenditures for medical care. In order to treat all medical costs consistently, they conclude that it is preferable to exclude all medical care costs from income because: (a) there are large variations in medical need and more medical needs do not leave the individual better off; (b) medical benefits are not fungible, especially for the poor; (c) and there are many difficult measurement problems in trying to value medical benefits. The poverty thresholds would also presumably be adjusted to exclude medical costs.

Aaron (U.S. Bureau of the Census, 1986), attributing the suggestion to Gary Burtless, suggests considering someone not poor only if he has adequate medical coverage. He argues that medical care is not fungible so medical benefits should not be added to income. However, if a person was not poor on the basis of income, he could still be classified as poor if he did not have health insurance coverage.

Work should also be carried out on valuing employer-provided benefits other than health insurance. Should employer contributions to retirement pensions be included in the non-wage compensation of current earners or as paid out to pension recipients (as is now done)? What about other benefits (life insurance, subsidized meals, etc.)? Much could be learned about non-wage compensation from a study matching household data with data from their employers on non-wage compensation.

The ownership of assets clearly promotes well-being. Homeownership provides the largest uncounted noncash flow of services not counted in family income. The Census Bureau estimated the imputed income from homeownership at 5.6 percent of cash income in 1994. Beyond measuring the flows from assets, though, is the issue of whether someone with even modest assets should even be considered poor. Indeed, many government transfer programs exclude those with low income from participation if their asset holdings are high enough.⁷

A.2. Disposable income

Even though Orshansky's original calculations were based on post-tax income, poverty has always been calculated for the official statistics using pre-tax income because of the limited information collected on the CPS. Census Bureau estimates of after-tax income are based on a model of the likely taxes a family of given circumstances would pay. While the model is reasonably accurate at an aggregate level, additional research could be carried out to improve its accuracy at the household level. Also important, though, is to address the advisability of deducting work expenses for wage earners such as child care and transportation costs in calculating disposable income.

A.3. Underreporting and nonsampling errors

Research matching household survey responses to federal income tax returns and comparison with national income accounts has revealed substantial areas where the level and receipt of certain income sources is underreported (see U.S. Bureau of the Census, 1991, Appendix C). Attempts to reduce underreporting were made by revising CPS questionnaire language for the SIPP when it was launched. This was only partially successful. Response errors remain. Time will tell how successful new questionnaire approaches introduced in February 1996 will be.

While current Census Bureau procedures reweight the data for full interview nonresponse and impute appropriate income responses for individual unanswered questions (item nonresponse), these are insufficient to correct fully for the problem. Procedures to enhance the data through microsimulation or other means should be investigated, along with continued improvement in imputation for nonresponse.

A.4. Other issues

In most societies, "underground," "nonmarket," or "black market" income from legal or illegal activities is typically omitted from official income statistics. This income ranges from barter transactions to home production (e.g., home gardens) to illegal income. Researchers are a long way from measuring this activity, however, so including this income into official statistics would be quite difficult.

It has been suggested that consumption is a better measure of well-being than income (see Cutler and Katz, 1991, and Slesnick, 1993). If a family can maintain its consumption through judicious use of assets when income falls, is it truly poor? Unfortunately, it is difficult to collect accurate annual data on consumption or even expenditures. Further, consumption reflects choices on how to allocate resources, rather than need. Nevertheless, fuller investigation of a consumption-based measure would be useful.

The final issue of income measurement I want to address is the choice of surveys on which to base income measurement. As discussed above, the SIPP questionnaire design, as crafted to reduce income underreporting, does succeed for almost all income sources.⁸ Yet, when compared to the CPS, it has historically had several drawbacks--a smaller sample size (one-third as large) and necessarily slower data release. These defects are compensated for by SIPP having greater income detail, both in number of sources and by having monthly as opposed to CPS's annual statistics. Further, the planned redesign of the SIPP, to be implemented beginning in 1996, will increase the sample size substantially (to 50,000 households). National estimates from SIPP will then be comparable to or better in terms of sampling error than those from the CPS (also planned to be 50,000 households but which uses a state-based design). One drawback for obtaining a consistent time series of annual national poverty estimates from the SIPP, though, will be sample attrition and time-in-sample bias as only one SIPP panel will be in the field during any one four-year period. The CPS sample is constantly refreshed by new sample households. SIPP also collects information on assets and liabilities, taxes, work experience and other information that can be used to analyze these and other issues.

While I can never envision the timeliness issue being resolved fully in SIPP's favor, SIPP can provide a preliminary estimate on much the same schedule as CPS. Still, it is desirable to view the surveys complementarily. If modeling using administrative records can correct underreporting errors in both surveys, they would then give the same aggregate statistics. The CPS could be used for a quick snapshot, consistent with data collected since 1947 (the SIPP began in 1983), while the SIPP would be used for more detailed estimates, for subannual and multiyear estimates, and for understanding other dimensions of poverty (assets, disability, gross flows and other dynamic aspects, and so forth).⁹

B. Poverty Definition

With an absolute measure of poverty, there are key decisions to be made about determining the appropriate level. The key research issues addressed here are

1. determination of the relationship between minimal commodity consumption levels and minimal income,
2. how to correct for differences in family size and composition, and
3. how to correct for cost-of-living differences across time and between areas.

B.1. Minimal consumption standards

Minimal consumption standards for all necessary commodities could in theory be established, perhaps by an expert panel, but doing so would raise difficult ethical issues about which commodities to include (e.g., is a telephone a necessity?). One alternative is to define minimal consumption standards for a limited number of necessities and obtain a poverty threshold by using a multiplier to account for necessities not measured. This was carried out recently by Renwick and Bergmann (1993), who developed a full "Basic Needs Budget" requiring no multiplier for single-parent families.¹⁰

B.2. Equivalence scales

The relationship embodied in the current U.S. poverty thresholds among families of different sizes (termed the equivalence scale) is supposed to represent the different relative costs of supporting those families at a minimally adequate levels. In fact, the relationship is based solely on the relative food costs as they existed in 1961 and include some unfortunate anomalies (see Ruggles, 1990, pp. 64-68). While it is possible to develop minimal budgets for every type and size of family separately and thus eliminate the need for equivalence scales entirely, in practice it is difficult to do so. No one scale now exists that is generally accepted. Issues in developing equivalence scales include which distinctions in family circumstances (e.g. owner/renter) should lead to different thresholds, how resources are shared within the family, and whether a more useful basis for determining poverty is the household (those living in one housing unit) rather than the family (those in one household related by blood or marriage).

B.3. Cost-of-living differences

In as large and diverse a country as the U.S., there are significant differences in the cost-of-living among localities. Unfortunately, there are no currently available data upon which to estimate interarea price differences reliably. Further, it is difficult to collect such data. In addition, were such data to be incorporated into poverty thresholds, it would lead to questions about whether government transfer program benefits (or even tax exemptions) should differ by area as well.¹¹ In my opinion, both the practical difficulty and the high cost for data collection of allowing prices to vary across areas suggests that this approach, in spite of its theoretical attractiveness, requires substantial research before adoption is indicated (see Kokoski et al., 1992, and Moulton, 1992, for some work in this area).

A related price issue is how to adjust for inflation. The U.S. poverty thresholds now use the CPI to adjust thresholds over time. If the measurement of minimal consumption is used as the basis for new thresholds, presumably this should be the basis every year, with components, prices, and multipliers re-estimated as often. Clearly this is not practical. A reasonable compromise might be to respecify and reestimate the minimal consumption bundle at pre-specified intervals as market baskets become outdated, say every ten years, and use the CPI for interim adjustments.

The market basket used for the CPI itself is typically reviewed and respecified at least once every ten years.¹²

III. The Committee on National Statistics Report

The National Academy of Sciences Committee on National Statistics (CNStat) released a report in May 1995 entitled *Measuring Poverty: A New Approach*. In that report, the committee recommended that the federal government redefine the way it measures poverty. The Office of Management and Budget (OMB) is convening a panel of experts from the Census Bureau and other agencies to examine technical methods for doing so.

The key changes they recommend are threefold: change the income measure, change the poverty thresholds, and change the survey used. To change the income measure from the current money income definition, they propose to add noncash benefits, subtract taxes, subtract work expenses, subtract child care expenses, subtract child support paid, and subtract medical out-of-pocket expenses (MOOP). The poverty thresholds are to be based on food, clothing, shelter, and "a little bit more" (75-83% of median expenditures on these items multiplied by 1.15-1.25), a new equivalence scale, an allowance for geographic variation, and updated annually based on growth in median expenditures. Finally, the panel recommended that the government use the SIPP instead of the March CPS to collect the basic income and poverty-related data.

A. Technical Issues

Among the technical issues to be resolved before implementing such a new measure are the following:

1. Reestimating the valuation methodologies for school lunches, food stamps, and housing benefits; developing new estimation methodologies for additional programs and possibly developing a new methodology for valuing Medicare and Medicaid (depending on whether the subtraction of MOOP is adopted or not);
2. Completing development of a tax simulation model for SIPP;
3. Developing a methodology for estimating MOOP (e.g. a statistical match of the National Medical Expenditures Survey to SIPP) or reestimation of employer contributions to health insurance using more recent data;
1. Estimating work and child care expenses;
5. Redesigning the SIPP sampling scheme to maximize reliability of a time series of cross-section estimates while maintaining some longitudinal estimation capabilities, taking account of the need for State-level estimates, and minimizing the attrition bias;
3. Reviewing the Consumer Expenditure Survey to improve its effectiveness for its new dual role (defining the market basket for the Consumer Price Index and the poverty thresholds) and possibly preparing for consumption-based rather than income-based poverty estimates in the future;
7. Creating a time series of poverty estimates from the SIPP and developing methods to impute additional variables to the CPS to develop comparable time-series data for that survey;
3. Doing substantial further work on income underreporting and imputation models;
3. Adding child support and alimony paid questions to CPS;
2. Developing and adding "medical care risk" and possibly medical expenditures questions to SIPP to supplement the poverty measure if medical care costs and benefits are excluded from the measure; and
1. Developing poverty estimation models for other surveys that cannot ask the detail that SIPP does.

B. Policy Issues

Even if these technical issues can be resolved expeditiously, there are still policy issues that must be debated and resolved before a new measure is adopted. These include:

1. Including or excluding medical costs and benefits. On the one hand, the CNStat recommended excluding MOOP, employer contributions to health insurance, and transfer program benefits from income. On the other hand, continuing current (experimental) practice would require revising the current method for valuing medical transfer program benefits and updating the methodology for imputing employer contributions to health insurance.
2. Basing thresholds on a pre-specified fraction of median expenditures. How might the public and Congress react to a new poverty threshold that showed millions more poor persons than the current measure? Are we confident about the quality of (i.e. lack of biases in) the Consumer Expenditure Survey data (even pooling three years)? It may be that the likely acceptance of any new definition would be enhanced if the new index were "chained" to the old by matching the overall rate obtained (allowing the distribution to vary).
3. Developing geographical cost-of-living variations. It is clear that the cost-of-living differs substantially from place to place, and different choices of methodology have different implications. If geographic variation is to be incorporated, some method for periodically updating the thresholds for relative price changes among areas would need to be established.
1. Annual inflation updating. The panel proposed using the rate of growth in expenditures to index the thresholds. This is an attempt to introduce some deliberate "relativity" into the measure and should be considered against just using the Consumer Price Index.
5. Choosing the equivalence scale. The panel recommended an equivalence scale of the form $(\#Adults + 0.7 \times \#Children)^{0.7}$. Choice of the scale will inevitably alter the distribution of the poor.
3. Including cohabiting couples. The decision whether to treat cohabiting couples, who obtain economies of scale by living together, "as if" they were married for statistical purposes, might jeopardize the confidence some people would have in the new measure.

7. Calculating child care expenses. The panel argued that work expenses should be deducted at a flat rate per worker per week worked as there is a substantial choice element involved (e.g. residential location affecting transportation costs). Since the decisions about which child care provider to use (e.g. paid or relatives), whether to choose shift work to avoid the cost, and even whether to have children at all are also choice issues, how should those costs be estimated (i.e. flat rate versus actual)?
 8. Underreporting. Should the income statistics from the survey be adjusted for underreporting based on administrative data and modeling?
 9. Review and Revision. Should any new definition include a regular cycle of review and revision based on pre-specified criteria (CNStat recommended once a decade)?
- If these issues are resolved in open debate, there seems to be the best chance in quite some time that OMB will approve and other policymakers will accept a revised methodology to improve the way the United States measures poverty.

Notes

*Chief, Housing and Household Economic Statistics Division, US Census Bureau. The views expressed here do not necessarily reflect those of the Census Bureau, the Department of Commerce, or the Office of Management and Budget. Sections I and II are based on Weinberg and Lamas (1994).

1. See Fisher (1992) for more historical detail on the development of the poverty thresholds.
2. Ross, Danziger, and Smolensky (1987) using 1950 Census data, have estimated the poverty rate for 1949 to be 40.5 percent.
3. The author participated in the deliberations of that task force. This paper does not necessarily represent the views of the other task force members.
4. The average family size was 3.70 in 1965 but only 3.16 in 1989.
5. Data are from the Compensation and Working Conditions Branch, Bureau of Labor Statistics. The 1966 percentage is not strictly comparable to the 1990 figure.
6. Fungible value is a crude estimate of the value of medical benefits to a family. Medicare and Medicaid benefits are counted as income to the extent that they free up resources that could have been spent on medical care. Neither has any income value if the family is unable to meet basic food and housing requirements.
7. See Fitzgerald and David (1987) for further discussion of this issue.
8. Exceptions are wages and salaries (due to a failure to always collect gross instead of net earnings) and workers' compensation (payments for injuries on the job.)
9. The Committee on National Statistics panel on the future of the SIPP recommended moving toward the use of the SIPP for official income and poverty measurement (Citro and Kalton, 1993).
10. A full review of budget-based approaches is in Watts (1993).
11. I am indebted to Mollie Orshansky for this point.
12. There is also an issue about whether to use the official CPI or an experimental CPI created to correct for errors in the official CPI in its measurement of housing costs prior to 1983.

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