

EXAMINATION OF ALTERNATIVE INCOME DISTRIBUTION
MEASURES USING THE SURVEY OF INCOME AND
PROGRAM PARTICIPATION PANEL DATA

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I. INTRODUCTION

Measuring incomes and sources of incomes received by persons and households is a major goal of survey programs because of the importance of such information in research and policy analysis. Among other reasons, this information is needed to estimate the impact of the tax and transfer system on the income distribution and on the size and composition of the poverty population. For example, estimating who is eligible for a particular government transfer program such as food stamps and how the eligible population changes under alternative program rules requires such information.

The purpose of this paper is to examine two problems in income measurement which will affect resulting estimates of the income distribution, namely, defining what is included in income and accounting for changes in household composition over time. As part of our discussion, we assess the Income Survey Development Program (ISDP) research panels and the planned Survey of Income and Program Participation (SIPP) in terms of their potential for enabling users to improve upon past solutions to these problems.

The SIPP is a major new national longitudinal survey which is scheduled to begin in the early 1980s. Its purpose is to collect information on program eligibility and program participation, on both cash and noncash income sources, and on net worth. Considerable research and developmental work has already been devoted to this effort under the Income Survey Development Program initiated by the Department of Health and Human Services (Office of the Assistant Secretary for Planning and Evaluation), in collaboration with the Bureau of the Census. Two panel studies have already been fielded: the 1978 and 1979 ISDP Research Panels, which have area samples of 1,947 and 9,300 households, respectively.

The ISDP research panels and the planned SIPP share a number of advantages compared to other commonly-used household surveys, for the purposes of measuring income and its distribution and for determining program eligibility, including the following:

- o Subannual income estimates, including monthly estimates, can be constructed
- o Information on asset ownership and amounts is included
- o Amounts of federal, state, and local income taxes paid are included
- o Changes in household composition are measured, thus avoiding the problem of producing estimates of last year's income based on the current household membership
- o Intra-year reciprocity can be examined, overcoming the present lack of knowledge on the extent to which people go on and

- off public programs
- o Low-income and high-income population groups are oversampled, providing better estimates of both extremes of the income distribution.

Because of its small sample size, the 1978 ISDP Research Panel is quite limited in its usefulness for measuring receipt and amounts of infrequently-received income types or for assessing in detail the characteristics of the population. In contrast, the 1979 panel, which is the prototype for the operational SIPP, should make possible advances in income measurement on a number of fronts.¹

The plan of the present paper is as follows. First we discuss conceptual issues in determining what should be counted as income and review and assess alternative definitions of income which can be used with household survey data. Second, we discuss alternative accounting periods and ways to operationalize the concept that income distributional data should reflect changing household composition. In each section, we evaluate the potential the ISDP panels and the SIPP afford for improvements in income measurement.

II. ALTERNATIVE CONCEPTUAL MEASURES OF INCOME

Economists have long been interested in the definition of income, motivated in large part by concerns about equitable taxation and comparisons of well-being. With the increase in the number and size of in-kind benefit programs in recent years, policy analysts have given explicit recognition to the importance of taking these noncash benefit types into account in measurement of the size of the poverty population and in comparisons of well-being in general.

In the first part of this section, we discuss conceptual issues in defining income, also noting in what ways two commonly-used measures--the Census definition of money income and the adjusted gross income (AGI) measure which is the base for federal personal income taxes--differ from the "comprehensive" conceptual measure suggested by economic theory. Second, we assess the content of the ISDP research panels and the planned SIPP in terms of (a) the additional information contained, as compared with other major recent or ongoing household surveys commonly used for measuring income, i.e., the Current Population Survey (CPS), the 1976 Survey of Income and Education (SIE) and the Public Use Samples of the Decennial Census;² and (b) the additional information that would be needed to apply very general conceptual definitions of income.

Income Concepts

The widely-accepted concept of income in the public finance literature is that of Simons (1939). This concept is one of total accretion; that is, income equals consumption plus the change in net worth. This definition implies that the following items should be included in the income measure:

- o All factor earnings--e.g., wages, interest, rents, and profits (for corporations, dividends and capital gains)
- o All irregular sources of income--e.g. gifts, inheritances, gambling winnings, and any (other) type of windfall
- o All cash transfers--e.g., public assistance
- o Noncash income--consumption not paid for with cash outlays, i.e.:
 - o In-kind transfers, whether from government (e.g. food stamps) or other sources (e.g., employer-subsidized health insurance)
 - o Imputed net return from personally-owned consumer durables, e.g., owner-occupied housing.

Costs of earning income, which do not represent consumption nor add to net worth, should be excluded under this concept.

The major area in question about what should be included concerns noncash income. With respect to privately-produced goods, a major part of consumption is produced by the household, so that the value of nonmarket production should be included. On the other hand, Cooper and Katz (1977) concluded that most economists feel that the value of leisure time (i.e., time not spent in "productive" activities) should not be included. Yet it is clear that to ignore differences in leisure is to distort estimates of well-being if leisure as well as money income contributes to "utility" or satisfaction, as is assumed in the optimal taxation literature and in much of the work on labor supply. Certainly, if leisure is not included in the measure of well-being, at a minimum the value of paid vacation and sick days should be excluded from a general measure of income, for to include them would involve double-counting.

With respect to government-provided goods, there is the same question of which ones should be included in noncash income. If benefits from programs such as Medicaid or BEOGs are to be counted, why not allocate expenditures on public health services and primary and secondary education among households? And if the latter, why not do the same with national defense expenditures? A major difference is in the extent to which the activity in question has aspects of a "pure public good."³ The direct benefits of goods such as private and secondary educational expenditures might well belong in a general definition of income, although how to determine which portion represents direct benefits poses a so-far unresolved problem.

In addition to the problem of what should be counted as noncash income, there is the problem of valuation. Because recipients may not value in-kind benefits as highly as they would a cash

transfer of equal cost to the provider, it can be argued that these benefits should not be included at their dollar cost.⁴

Measures of income that have been employed in practice diverge from this income concept to a considerable extent. Probably the most commonly-used measures of personal income are the Census (CPS) money income measure, which is employed in the Current Population Reports P-60 Series, and the adjusted gross income measure, which is the base on which federal personal income taxes are calculated and is reported in the Internal Revenue Service Statistics of Income Series, where:

- o Census money income includes all regular cash receipts
- o AGI includes most factor earnings, some irregular cash receipts, and some cash transfers.

Each of these measures excludes at least some components of the sets of items included in the comprehensive conceptual measure discussed above, including all government in-kind transfers and almost all other noncash benefits. In particular, the Census income concept excludes realized and unrealized capital gains, inheritances, other lump sum amounts, and all noncash income. AGI excludes unrealized capital gains, part of realized capital gains, certain other preferred sources of asset income and profits (e.g., interest from state and local government bonds and some portion of dividends), inheritances and gifts received, major types of cash transfers (Social Security Benefits, AFDC, other welfare income, and part of unemployment compensation), and government-provided in-kind benefits and major employer-provided fringe benefits. Other noncash income, such as services received by members of a barter club or shares of stock purchased from the employer at less than market price, must be included at market value. Only the AGI measure excludes any of the costs of earning income incurred by employees, namely entertainment expenses and travel expenses (excluding expenses for commuting to the regular place of work).

Data Availability

The CPS, the Public Use Samples of the Decennial Census, the SIE, and other existing national microdata sets do not provide information on a number of the components of income as defined above, including all capital gains, and lump sum amounts from inheritances, gifts, and other sources. They also fail to provide information on taxes paid. The CPS and SIE exclude information on the value of automobiles, costs of earning income, coverage by certain fringe benefit types, and certain in-kind transfers; the CPS also excludes value of the home. The Census Public Use Sample includes value of the home (for many, but not all respondents) and number of automobiles but excludes fringe benefits and in-kind transfers entirely.

The ISDP research panels provide a considerable amount of information on receipt of components of the ideal measure of income outlined above, and offer considerable potential

for valuing noncash income receipt, as discussed in Manser (1981). An Appendix table, available upon request from the authors, shows, in detail, which income sources are measured in the CPS and in the 1979 ISDP Research Panel. The ISDP panel, unlike the CPS and also the SIE, contains information on lump sum amounts (inheritances, etc.). While each of these surveys obtains information on many in-kind benefit types, only the ISDP panel includes information on subsidized child care and day care, employer-subsidized life insurance, and other employer-provided benefits; however, it excludes Champus and military-provided health benefits which the SIE covers. In addition, the 1979 ISDP panel contains information on the market value of owner-occupied homes and on automobiles owned. The ISDP panel data also contain information on taxes paid, collected as part of the annual "income roundup." (Furthermore, because of the greater detail on income sources and various other items which affect personal income taxes, the panel data will support improved simulations of taxes.)

Because some income items in the ISDP panel are obtained only in the roundup and others are obtained only in one interview, considerable effort would be required to construct total income inclusive of all the sources for which amounts are measured. Also, to value the noncash income components, especially when there is no information included on dollar amounts, would require a major research effort.

Nonetheless, because of the considerable detail on income sources it contains, the 1979 ISDP Research Panel makes it possible to calculate income under a wide variety of definitions. This is extremely important, because the ability to reproduce definitions constructed from other data sets is needed to provide a check on the validity of the information contained on these survey instruments and on the comparability of these data with series now available and because different measures of income are needed for different purposes. Specifically, the ISDP data will permit calculating income based on the following definitions: the Census money income concept; AGI; and a variety of more comprehensive measures.

III. DETERMINING THE ECONOMIC UNIT AND ACCOUNTING PERIOD FOR MEASURING INCOME

In addition to the issues discussed above about the kinds of income that should "properly" be included for any comparative assessment of well-being of different groups in the population and how these income types should be valued, there are other measurement issues to be addressed as well. Two sets of important and intertwined issues relate to the time period over which income--of whatever type--should be counted and to the definition of the economic units to which income should be assigned.

Accounting Period Issues

Looking first at the question of the appropriate time period--usually referred to as the accounting period--for measuring income, it is well documented that income receipt shows

wide swings over time for many persons and families. There are life cycle variations, where income is typically lower during years of human capital investment in schooling and in retirement compared to the peak years of labor force participation. During the course of a calendar year--the period for which income is counted for taxation and which people typically reflect on in terms of "did I have a 'good' or 'bad' year"--there are seasonally employed persons such as construction workers and teachers who expect to have months of low cash flow in the context of an otherwise satisfactory year. Other persons have unplanned, serious interruptions in cash flow due to unemployment, changes in family situation, and other causes.

The question for assessment of well-being and for design of government tax and transfer programs is the "appropriate" period over which to measure income flows. The tax system, as noted, uses a yearly accounting period, for the most part, so that good and bad months are averaged out over the year (to some extent, over several years, under the "income averaging" provisions).

Most means-tested transfer programs have as a primary goal providing assistance to persons and families who have unplanned reverses at the time they need help and therefore have short accounting periods, typically a month. Problems of equity can arise with this system, in that the seasonal worker with expected low income months appears as eligible to the welfare office as the family whose breadwinner was just disabled. The choice of accounting period for transfer programs can have dramatic effects on costs and caseloads of these programs. Using data from the Denver Income Maintenance Experiment, Springs (1978) estimated that caseloads expected under the Carter Administration's proposed Better Jobs and Income Program would be about 20 percent less if a three-month accounting period were used compared to a one-month period. Reduction in costs would be only 7 percent, however, because families dropped would be those with higher average income who are eligible for smaller benefits.

The Survey of Income and Program Participation is the first survey that will make possible analysis with a sizeable nationally-representative sample of effects of accounting periods shorter than a year on estimates of differential well-being and government tax and transfer programs. Lane (1981), in tabulations of the first wave of the 1979 ISDP Research Panel, determined that 15 percent of households were below the poverty line based on income only for the previous month, while less than 14 percent were poor when the income for all three months of the interview was included, compared to a figure from the Current Population Survey of 12 percent in poverty based on a yearly accounting period. (The income definition used included earnings, property income, and cash transfers.) Expressed another way, the number of poor households was reduced by 7 percent going from a one-month to a three-month accounting period and by almost 20 percent going from a one-month to twelve-month accounting period.

The purpose of this discussion is not to identify the "best" accounting period but to point out that the choice of accounting period has implications for public policy to the extent that the proportion of persons and families below some standard of well-being is used as a criterion for program design and evaluation. The choice is also important in analyses of the characteristics of persons at different income levels; the population falling into the lowest income quintile based on a one-month accounting period, for example, will not overlap entirely with the population in that quintile based on a full year's income.

With current budgetary pressures on the federal government, proposals are surfacing to lengthen the accounting period for some transfer programs or at least to measure actual income received retrospectively rather than to accept applicants' prospective estimates. It is also true, that, from the perspective of users of income statistics, even when intra-year income figures are available regularly from the SIPP, there will continue to be demand for annual income statistics, such as are currently published in the P-60 Consumer Income series based on the March CPS. Program personnel and analysts will want to know how the country fared over the previous year in terms of total and average income and changes in the proportion of persons below poverty.

Defining the Economic Unit

The interest in an annual accounting period for income statistics brings up the second set of issues of defining the economic units to which to assign income receipts during the year. If income statistics were always reported and analyzed strictly on an individual person basis, no problem would arise. However, the income available to many persons is not simply their "own" receipts but receipts earned or otherwise acquired by other members of the household or family. Similarly, standards of need such as the poverty level recognize economies of scale for larger families. The P-60 reports include tables, not only for persons, but for families and households. The problem arises in that family and household composition is not static for all of the population during the year. Persons are born and die, move into and out of the household for reasons of marriage, separation, divorce, going off to and returning home from school, and so on. Changing family and household composition leads to the question of how to define the unit to which to assign the income of individual members during the year.

The Current Population Survey currently deals with this issue in a very unsatisfactory way; however, the procedure followed has been accepted in the absence of nationally representative data that would permit doing anything else. In the CPS, income is measured over the preceding calendar year for members of each sample household who were present in March of the following year, although not all of these members may have been part of the household during the income accounting period. Moreover, income of members of sample households who died

before the interview, were institutionalized, or moved abroad is excluded entirely.

Some empirical evidence is available relating to the extent of the distortion introduced into the CPS-based estimates of families and persons in poverty because of the different accounting periods used for family composition versus family income. Scardamalia (1978) used longitudinal data for 1972 and 1973 from the Seattle and Denver Income Maintenance Experiments to replicate the CPS procedures whereby poverty status is based on annual income for the preceding calendar year of the members of a person's family interviewed in the following March. Scardamalia also determined incomes and poverty thresholds for SIME/DIME participants month-by-month, and then aggregated these figures over the calendar year. Comparing the two estimates showed that the number of people in poverty was reduced from 31.6 percent of the total sample of 3,614 low-income persons enrolled as controls in SIME/DIME using the CPS measure to 27.3 percent using the measure based on actual family composition. This decrease of 4.3 percentage points represents a 13.6 percent reduction in the number of poor across the two experimental sites.

Presumably what is going on is that the CPS finds split family units in March that appear to have had little or no income in the previous calendar year (e.g., a recently divorced mother who did not work), when in fact the units were intact most or all of the previous year with sufficient income to raise them above the poverty line. Of course, the converse situation can occur, namely families forming through marriage or remarriage between December and March, whose members' combined income during the previous year was above the poverty line but not their individual incomes, so that persons in these families would be reclassified as poor using a measure based on actual family composition instead of the CPS measure. However, among the SIME/DIME samples, whereas 45 percent of the persons in families that lost an adult member sometime prior to the CPS point of measurement were reclassified from poor to non-poor using the alternative measure, less than 20 percent of the persons in families that gained an adult member were reclassified in the other direction. That non-working recently-divorced woman, who showed up erroneously as poor for year t-1 based on the March CPS for year t, had probably acquired a job or obtained transfer support in year t, so that when the March CPS for year t+1 found her recently remarried, her poverty status for year t was non-poor whether or not her new spouse's income was included.

The SIME/DIME data, however, cannot be used to estimate the total effect on the number or proportions of poor using a measure based on actual family composition compared to the CPS. The SIME/DIME samples are not nationally representative in any sense and exclude certain categories of the population, specifically households with heads not in the labor force because of age, disability or schooling. Moreover, the rules of the experiments restricted persons who could officially enter families after the start of the study to those who were already enrolled in the experiment, who

were under 21, or entered the family through marriage. These restrictions are evident in the statistics that a total of 364 SIME/DIME control persons were in families that lost an adult member during the period studied by Scardamalia, while only 41 persons were in families that gained an adult member.

The SIPP is the first nationally-representative sample that should make possible an assessment of the distortion introduced into income and poverty statistics by the different reference periods used in the CPS to measure income versus family composition. The SIPP data should also make possible evaluating other procedures for constructing annual household and family income statistics.

The 1979 ISDP Research Panel permits some initial steps in this direction, although the data are not ideal for the purpose. The panel design focused on following original members of the sample with a complete month-by-month income history being obtained for these persons throughout the span covered by the three-month interviews (except where the person left the sample through death, institutionalization, moving abroad, etc.). However, in the case of new persons--called "additional observations"--who were interviewed because they joined the household of an original sample member, retrospective information on their income was obtained only for the immediately preceding quarter and not back to the start of the panel; nor was any information obtained about other persons who had lived with the new addition at a prior time in the year, thus precluding a full replication of the CPS income concept.

The 1979 panel was designed to obtain a complete picture of household and family composition for all sample households at the time of each interview, thus providing multiple data points during the year, compared to the single measure of household composition following the reference period obtained by the CPS. The design, though, did not attempt to measure household composition in detail for each and every month, although it is possible with some effort using data for persons linked across interview waves and working with arrival and departure dates to reconstruct monthly household composition for most cases with the ISDP data.

It is worth considering adoption of field and processing procedures for the SIPP that will readily permit a complete accounting of household and family composition on a monthly basis to go along with the complete month-by-month income record. Ideally, presence in the household and relationship to the reference person would be ascertained for each month for all sample persons.

As an exploratory assessment of the results that might be expected with the SIPP, we examined a sample of families on the Wave II interview of the 1979 ISDP Panel that gained or lost an adult member during the three-month reference period. Of the total of 4,922 households containing families in Wave II (we excluded households made up solely of unrelated individuals), representing 59.5 million families on a weighted basis, 178 gained one or more new adult members and 206 lost one or more adult

members during the period prior to the interview date. Of these, 10 households both gained and lost adult members. On a weighted basis, families gaining adult members accounted for 2.0 percent of the total, while families losing adult members accounted for 3.4 percent.

We examined the income for the initial month of the reference period for samples of Wave II families gaining or losing members, first summing up incomes for persons present at the time of interview (the month following the end of the three-month reference period), analogous to the CPS procedure, and then again summing up incomes for only those persons actually present during that first month. These incomes were compared to poverty thresholds, derived by taking the appropriate annual figure for the family's composition and dividing by twelve.

Our sample for families gaining adult members consisted of 103 households (of the total of 178) with complete information on arrival dates. Of these, 16.1 percent on a weighted basis had incomes below poverty using the CPS-type measure and 83.9 percent had incomes above poverty. Of the cases above poverty, only one fell below poverty counting the incomes in the initial month only for the original family members. Including this case raises the weighted percent of families in poverty which gained members by less than 1 percentage point, to 17.0 percent.

Our sample for families losing adult members consisted of 67 cases (of the total of 206), most of which lost an adult who dropped out of the sample due to death, moving abroad, institutionalization, etc. Using the CPS-type measure, fully 23.5 percent of these cases, on a weighted basis, had incomes below poverty and 76.5 percent had incomes above poverty. Upon inspection, three of the cases below poverty had incomes above poverty when the income of the departing member for the initial month was taken into account. Taking out these cases lowers the weighted percent of families in poverty which lost members by more than 5 percentage points, to 18.4 percent.

The results of this examination are in the expected direction but must be viewed as tentative, in that the samples of families with entrants and leavers were small and only one month of income was included. It is important that a full study be made using the SIPP data when they become available.

Alternative Approaches

Assuming that the results of such a study will show that distortion is introduced into the annual income statistics through omitting income of sample members who permanently left the sample frame and through misassociating income with economic units, the question becomes how better to define economic units in the context of an annual income accounting period. The very richness of the SIPP data adds to the researcher's perplexity concerning how to approach the issue (see Ycas, 1981, for a comprehensive review of alternatives proposed to date). One avenue is to devise household and family type definitions that recognize changes in composition during the year. The problem

here is when is change truly change and when is it not? For example, it is probably noncontroversial that the birth of a second child to a husband-wife family is not enough of a change to warrant a separate column in the income reports, whereas losing a spouse is. There would be less agreement on treatment of changes between these extremes. Assuming that reasonably satisfactory definitions can be adopted, there is the problem of interpreting annual income statistics for part-year units; some procedure such as converting the figures to average monthly amounts and average monthly poverty thresholds would be needed for comparability across family types that were in existence only part of the year versus those in existence the entire year.

Another approach is to follow Scardamalia by reporting all income and poverty statistics for individuals, taking advantage of the data in the SIPP that should make it possible to construct family income on a month-by-month basis for all sample persons. This procedure is conceptually clean and users would not have a hard time understanding statements such as "X percent of male professors, age 35-54, lived in households last year that had incomes of \$20,000 to \$29,999." However, this concept does not of itself permit deriving total or per capita personal income or any measures such as median household or family income, because individual income is duplicated for all persons with which the person lived during the preceding year. Moreover, this concept does not permit making policy-relevant assessments such as, for example, if only 50 percent of persons eligible for food stamps participate, how many households must be targeted for outreach programs.

Yet another approach is to abandon the concept of annual income statistics and move to a shorter accounting period, on the grounds that fewer changes in family composition will occur over a shorter span and that therefore less distortion is introduced by measuring income for the reference period for those family members present right at the end of the period (with the SIPP, one can improve upon the CPS by determining family composition immediately subsequent to the income reference period rather than with almost a three-month lapse). This procedure has some attractions, but flies in the face of conventional usage of an annual assessment of how people are faring, and ignores the problem of income variability noted above. It might be possible to develop weighting factors, with seasonal adjustments for income flows, that would permit basing annual income statistics on moving averages of quarterly or even monthly income amounts.

IV. CONCLUSION

The 1979 ISDP Research Panel makes it possible to explore some alternatives for constructing conceptually clean and accurate annual income and poverty statistics. The SIPP itself should permit even more research in this area. Such research appears to be a high priority for improving our understanding of patterns of income distribution in the U.S.

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FOOTNOTES

¹For some noncash income types, the 1978 questionnaires are more comprehensive than those for 1979. While tabulations of receipt of those income types using the 1978 panel data can only be regarded as illustrative due to the small sample size, a review of the content of that survey is valuable to point out items that should be included (perhaps in a modified fashion) in a future survey; see Manser (1981).

²Throughout this paper, our discussion of the CPS refers to the content of the March 1980 questionnaire, which is a considerably expanded version of previous March CPS questionnaires.

³Briefly, a pure public good is a good which no individual is excluded from consuming, having the property that consumption of the good by one individual does not reduce the amount available to any other individual; see Samuelson (1954).

⁴For discussions of approaches to valuing recipient benefits, see Smeeding and Moon (1980) and Manser (1981).