

Poverty Measurement Research Using the Consumer Expenditure Survey and the Survey of Income and Program Participation

(with supporting estimates from the Current Population Survey)

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The most recent comprehensive examination of poverty measurement in the United States was conducted by the National Academy of Sciences (NAS) Panel on Poverty and Family Assistance (Citro and Michael, 1995). In their report, the Panel recommended changing the definition of both the poverty thresholds and the resources that are used to measure poverty. In this paper we implement the Panel's basic procedure, with slight modifications, and describe further work needed to implement remaining recommendations. A detailed analysis of how changes in the definition and derivation of the poverty thresholds affect poverty estimates has been the focus of earlier research⁽²⁾. The primary focus here is to describe how resources might be defined and how changes in the definition of resources would affect poverty rates.

This paper presents poverty estimates using thresholds derived from Consumer Expenditure Survey (CEX) data for 1989 to 1991, and family resources based on data from the 1991 panel of the Survey of Income and Program Participation (SIPP) and the March 1992 Current Population Survey (CPS). The resulting poverty rates are compared with those based on the official measure. While previous work⁽³⁾ has examined the experimental poverty measure exclusively using the CPS, this paper presents, for the first time, estimates from the SIPP, the survey that the Panel recommended become the official source of poverty resource measurement. Additional estimates from the CPS from 1991 to 1996 are presented in order to examine the behavior of the experimental measure over time.

Our findings reveal that changes in the poverty rates based on the official and the experimental measures are similar during the 1991 to 1996 time period. We show that poverty rates using SIPP data are lower than those using the CPS, in part because the more detailed questions in the SIPP identify more types and larger amounts of income. We also show that using the experimental poverty measure yields a poverty population that looks more like the total population in terms of various demographic and socioeconomic characteristics than the current official measure does.

I. Defining the Thresholds

The NAS Panel recommended that the Consumer Expenditure Survey (CEX) be used to produce poverty thresholds for a particular year using data from the most recent three years, and that the thresholds be updated annually. Specifically the Panel recommended that the thresholds should represent a budget for food, clothing, shelter, utilities (FCSU), and other needs for a particular reference unit using their actual expenditures. For this study, we use CEX data from 1989 through 1996 to produce thresholds for the years 1991 through 1996. However, only the 1991 thresholds, updated using the CPI-U, are used for the poverty analysis in this paper. In this study, as in the Panel's study and in our previous work (Garner et al. 1998; and Johnson et al. 1997), the thresholds are obtained by following several steps. First, median expenditures (adjusted to current dollars) for reference units are obtained using their FCSU expenditures. Second, percentages of median expenditures are selected which reflect the 30th and 35th percentiles of the distribution of FCSU expenditures. These percentiles translate to 78 and 83 percent of the median. The Panel concluded in their study that these percentiles seem to represent a "reasonable range" for the FCSU component of the reference family's threshold.⁽⁴⁾ Third, expenses for their other needs (e.g., household supplies, personal care, and non-work related expenses) are accounted for through the use of a small multiplier. The Panel recommended a lower and upper value for the multiplier of 1.15 and 1.25, respectively. They stated that this range of multipliers compared favorably to estimates from other studies⁽⁵⁾ that range from 1.14 to 1.30.

In this study, as in the Panel's work, we use these ranges of the percentages and the multipliers to obtain our thresholds for the reference unit. The base year threshold is computed by taking the average of these upper and lower values for both the percentages and multipliers (i.e., $\text{Threshold} = 0.5 \cdot (1.15 \cdot .78 + 1.25 \cdot .83) \cdot \text{median}$), with

the result being that the threshold equals 0.96725^* median expenditures for the basic bundle. Hence, the resulting threshold is almost equal to median expenditures on FCSU.

Fourth, adjustments are made to reflect geographic difference in costs. Following the Panel, we use inter-area housing cost indexes calculated from the 1990 Census data on gross rent (including utilities) for apartments with specified characteristics, adjusted for the share of housing in the proposed poverty budget.^{(6),(7)} These indexes are produced for five population size categories within each of the nine census regions. In our application, we normalize the indexes based on the geographic distribution of the weighted sample (see Johnson et al., 1997 for a similar approach). The area indexes are produced relative the U.S. average index equaling to 1.0. For example, the threshold for a two-adult/two-child reference unit in a large metropolitan area in New England is 27 percent higher than the national average, while it is 15 percent lower than the national average if this family lives in a non-metropolitan area in the West South Central region.

Fifth, an equivalence scale adjusts the reference units' threshold to produce thresholds for household units with different characteristics than those of the reference unit. Following the Panel's recommendation, we use a two-parameter equivalence scale that accounts for the differing needs of adults and children and the economies of scale of living in a larger household. This scale is $(A+PC)^F$, where A and C represent the number of adults and children, P represents the adult-equivalent of one child and F represents the scale economy factor. We use $P=0.7$ and $F=0.65$ since these scales minimize the effect on overall poverty and are most similar to the current scales (see Citro and Michael, 1995 and Johnson et al., 1997).⁽⁸⁾ This scale is normalized such that the reference unit obtains a scale of one. Based on this procedure, the threshold for a single person is about 45 percent of the threshold for the two-adult/two-child unit. The threshold for a household with two adults and three children is about 13 percent higher than the threshold for the two-adult/two-child reference unit.

Sixth, the base year thresholds are updated using a price adjustment factor. While the Panel recommended updating by the change in median expenditures each year (a quasi-relative adjustment), they also recommended that an alternative set of thresholds be produced during the first several years after the new poverty measure is implemented which are updated for price change only.⁽⁹⁾ For our poverty analysis, we follow the second recommendation and use the thresholds based on the updated 1991 threshold. Johnson et al. (1997) showed that the change in the FCSU median expenditures for the reference unit were similar to the inflation rate over the 1990-95 period; however, annual changes in these expenditures were more volatile than the inflation rate. Over a longer period, though (1982 through 1995), the median expenditures increased 4.4 percentage points more than did the CPI-U.

There are three technical differences between the approach used in this study to produce the thresholds and the approach used by the Panel and an earlier study (Garner et al. 1997.) First, the Panel recommended using a household with two adults (married or unmarried) and two children as the reference household unit, while the Panel's calculations were based on the expenditures of a consumer unit⁽¹⁰⁾ composed of a married couple with two children. In this study, we follow the Panel's original recommendation and identify the reference unit as one including two adults and two children. Second, in this study we use the most recent three years of data (e.g. 1989-91) as opposed to the Panel's use of data from the previous three-year period. Finally, the Panel study approximated the median expenditures by using mean of the middle vintile. Here we use the weighted median as our starting point to produce the thresholds.

Johnson et al. (1997) show that these modifications do not significantly change the threshold for the reference unit. The use of two adults and two children instead of married couples with two of their own children produced the greatest difference; the difference in thresholds is on average \$400.⁽¹¹⁾

Presented in Table 1 are the official thresholds for 1991 through 1996; these are compared to two sets of the experimental thresholds. The thresholds presented in column (2) are CPI-U adjusted and those in column (3) are median-expenditure adjusted. From 1991 to 1996, the CPI-U adjusted thresholds increase by 15.2 percent while the median expenditure adjusted thresholds increase by 13.3 percent. While this is different than the Panel's expectation that updating the thresholds by the change in median expenditures for the basic bundle would yield larger increases in the thresholds than simply updating by the inflation rate, this relationship does not hold for the longer period between 1982 and 1996. These latter years are different partly because the changes in the median expenditures are more volatile than changes in the CPI-U.

II. Defining Resources

Following the Panel's recommendation, we use an experimental resource measure that is based on money income plus the value of in-kind transfers, but which excludes work-related expenses (including child care expenses while working), child support paid, medical out-of-pocket expenses, and taxes paid. We begin with the current official income measure which includes cash income before taxes. To this amount we add dollar values for in-kind benefits. We then subtract expenses that the Panel suggested are necessary for a family to earn a living and which therefore are not available to purchase the items covered in our thresholds (food, clothing, shelter, and utilities). These additions and subtractions are made to produce a more complete measure of family

resources. The values of in-kind benefits received and subtractions from income are determined using the methods described below. Average imputed values for the additions and subtractions are presented in Table 2.

Additions to family resources:

1. Food stamps - Food stamp reciprocity and amounts received are reported in both the CPS and SIPP. The amounts received are added to each recipient family's income. Table 2 includes, for both surveys, the proportion of persons who are in families with someone reporting the receipt of food stamps, and their average family values received. As shown there, the average amount of food stamps received are similar in the two surveys, \$1,951 in SIPP and \$1,909 in CPS.

2. School lunch and breakfast programs - Respondents in both the CPS and SIPP surveys are asked about the number of children in the household who receive free, reduced, or regular priced school lunches. The income value for the school lunch program for each participant family is calculated using this information and data on the annual subsidy for free, reduced, and full-priced meals⁽¹²⁾. Information on subsidies per meal are obtained from the Department of Agriculture. The percent reporting receipt and average annual lunch subsidies as imputed to the CPS and SIPP are shown in Table 2.

In each wave, SIPP respondents are asked about the number of children receiving free, reduced, and full-priced breakfasts. Breakfast subsidies are imputed in much the same way as lunch subsidies in the SIPP. In the CPS, no information is collected about participation in the Federal School Breakfast Program; therefore, such subsidies are not counted in the experimental CPS measure. The average annual breakfast subsidy in SIPP is \$175.

3. Housing subsidies - In this paper we use Fair Market Rents (FMRs) to value housing subsidies in the SIPP (See Shea et al., 1997 for details.) However, to estimate subsidies in the CPS, we use the methods currently described in our annual income and poverty reports as part of our tax and in-kind valuation procedures⁽¹⁴⁾ based on data from the 1985 American Housing Survey (AHS). Shea et al. (1997) and Naifeh et al. (1997) examine the various methods of accounting for housing benefits and their relative merits. Their work discusses the need for updating the current valuation procedure used here for the CPS measures.

The Department of Housing and Urban Development (HUD) has developed FMRs for the purpose of determining rental subsidies for eligible households for Section 8 housing programs in 341 metropolitan areas and in 2,416 counties outside metropolitan areas. These FMRs are set at the 45th percentile of the rent distribution of two-bedroom apartments that were rented in the preceding two years in a given area. Under the Section 8 housing program, renters pay 30 percent of their net countable⁽¹⁵⁾ income towards a rental amount (more in some programs if their rent exceeds the FMR). The difference between the FMR and 30 percent of income is the housing subsidy.

After matching the FMRs to our SIPP file, we subtract 30 percent of household gross money income from the FMR of all respondents who indicate that they receive a housing subsidy or that they live in public housing.⁽¹⁶⁾ The resulting housing subsidy is then added to income for our experimental measure.

Our housing subsidy estimates for the CPS are based on a method that the Census Bureau has been using since 1979.⁽¹⁷⁾ Poverty estimates which take account of housing subsidies in measuring resources have been published annually using the Current Population Survey. The method is based on a model of market rents that is estimated using the 1985 American Housing Survey. The model estimates monthly housing costs for 2 bedroom units of nonsubsidized renters in each of the four Census regions Northeast, Midwest, South, and West. The regression coefficients are then applied to the housing characteristics of subsidized renters in the relevant region yielding market values of housing costs for subsidized units. The market rents that are predicted from this model are used to compute subsidy amounts based on income and regional categories and then matched to families on the CPS according to the number of bedrooms a family could have based on family size and composition. Table 2 shows the mean imputed annual housing subsidies, in the CPS and SIPP, for families living in public or subsidized housing during 1991. The annual average family subsidy amount for persons who lived at least one month in such housing during 1991 is \$2,993 in SIPP based on the FMR method. The FMR method yields aggregate annual expenditures on housing subsidies of \$14.5 billion based on these data, matching a HUD benchmark that reports agency spending totals on housing programs⁽¹⁸⁾.

The CPS mean imputed annual housing subsidy is \$1,992 for 1991 based on the Census method. The different methods for valuing housing subsidies account for the large difference in average amounts. The subsidy amounts based on the FMR method are higher than those based on other methods. The Census valuation method has been criticized for producing subsidy amounts that are too low.⁽¹⁹⁾ We are currently considering adopting the use of FMRs in the CPS. Naifeh et al., 1997, showed the effect on poverty statistics of using various methods of valuing housing subsidies in the CPS, including the method used here and one using FMRs.

4. Energy assistance -- SIPP collects information on whether persons receive benefits from the government's energy assistance program and the amount received in each wave. This information is collected in the CPS but is not included in the CPS experimental resource measure here. We will be examining the information collected in the CPS on energy assistance and deciding whether to incorporate this information in an experimental family

resource measure. As shown in Table 2, the average family amount of persons in families with this benefit in 1991 was \$278 based on SIPP data.

5. Special Supplemental Food Program for Women, Infants, and Children (WIC) - Data on this program are collected in the SIPP but not in the CPS. Since this information is not collected in the CPS, we add WIC benefits to income only in the SIPP.

Subtractions from family resources:

1. Work-related expenses -- The Panel suggested subtracting from family income a flat weekly amount for work-related expenses, not to exceed the person's earnings, and to update these amounts annually for inflation.⁽²⁰⁾ While data on work-related expenses are not collected in the CPS, they are available from the 1987 panel of the SIPP.⁽²¹⁾ Tabulations from the 1987 SIPP panel show a median weekly amount of \$17 (in 1992 dollars) for these expenses. As suggested by the Panel, we use 85 percent of the median, amounting to \$14.42 and restrict all work-related expenses (child care plus other work-related expenses) such that they do not exceed the earnings of the working parent (the parent with the lowest earnings if both parents work.) The SIPP data are also used to impute values for work-related expenses of families in the CPS. These procedures resulted in similar mean work-related expenses for the SIPP and CPS, \$1,205 in the SIPP and \$1,144 in the CPS. For the time series estimates we update these amounts using the CPI-U.
2. Child care expenses while working -- Child care expenses related to work are subtracted from income for SIPP and CPS families with no non-working adult. The method to value these expenses is based on child care expenses as reported in the 1991 SIPP; no child care expenses are collected in the CPS. Imputed amounts are assigned to CPS families. Using a method described in Short et al. (1997), these expenses are valued at 85 percent of median reported child care expenses, similar to other work-related expenses, for SIPP families.⁽²²⁾ These values are assigned to single working parents and two-earner families with children in both surveys. In 1991, 85 percent of the median amounted to \$2,166 for families with one child and \$2,608 for families with two or more children.⁽²³⁾ Resulting average child care expenses are shown in Table 2. Our 1991 estimated child care expenses are adjusted for inflation using the CPI-U for the time series estimates 1992 to 1996 presented in this paper. Since child care expenses are collected each year in the SIPP, an alternative adjustment would be to compute these amounts each year from the SIPP medians. Preliminary estimates suggest that results would be similar to those reported here using this method.
3. Child support paid -- The current official poverty measure counts child support payments as income to recipient families, but does not subtract such payments from the income of the paying parent. While respondents are asked about such support payments in the SIPP, we do not collect this information in the CPS and we make no attempt to impute values for them. Therefore, child support paid is reflected in our experimental SIPP measure but not in the experimental CPS measure. Table 2 shows that average child support payments for persons who reported such payments during 1991 are \$3,286. Our calculations show that accounting for child support paid in the SIPP experimental measure increases the poverty rate by less than 0.1 percentage points.
4. Medical out-of-pocket expenditures -- Out-of-pocket medical expenditures are imputed to the CPS and SIPP based on data from the 1987 National Medical Expenditure Survey (NMES) updated to reflect the accounting period of the March 1992 CPS. We use a modification of the method described in the Panel's report⁽²⁴⁾. Following Betson (1995b), we use separate procedures for families headed by someone younger than 65 and those headed by someone 65 or older. Betson used a two-stage imputation model. The first stage stochastically assigns families to have medical expenses based on family characteristics. For families with a non-elderly head, assignment is based on health insurance status, family size, race of head, and income-to-poverty ratio. For families with an elderly head, Betson used age of head (under 75 years, 75 years and over), income-to-poverty ratio, and family size. In our application, we randomly assign a fraction of the CPS and SIPP families to have medical expenses to match the fractions in the NMES calculations. If a family is assigned to have positive expenses, actual amounts are imputed using a second random draw to be consistent with the distribution of NMES expenditures. Imputed amounts are bounded at \$1.00 on the low end and at the 99th percentile of reported expenses on the high end (\$8,200 for non-elderly and \$18,000 for elderly family heads.) Medicare Part B premiums are added to these expenses for each elderly householder who reported Medicare coverage (but not Medicaid) and his/her elderly spouse. In the final step, we calibrate expenditures to match a benchmark total. The target for medical out-of-pocket expenditures (MOOP), excluding Medicare Part B premiums, that we use for 1991 is \$204.3 billion. This aggregate expenditure amount is obtained by adjusting the benchmark total used in previous work⁽²⁵⁾ for 1992 by the CPI for medical care. Target amounts are adjusted similarly for the CPS time series estimates. (See Table 3 for these amounts.)
5. Taxes -- In the CPS resource measure presented here, we subtract imputed federal and state income taxes and Social Security payroll taxes from income and add the refundable Earned Income Credit (EIC) to income to arrive at after-tax income. Tax simulations are based on the March CPS annual demographic supplement and

statistical summaries of individual income tax returns compiled by the Internal Revenue Service. The simulation of Federal income taxes requires the formation of tax filing units using household relationship, marital status, and dependency rules. Adjusted gross income is then calculated for each unit, including simulated capital gains or losses, and the EIC is assigned when applicable⁽²⁶⁾.

No adjustment for taxes paid is made to the SIPP resource measure reported here. While taxes paid are reported in a topical module in the SIPP, at this time we have not developed an appropriate method to incorporate this information into a complete tax model. Work has been done in this area⁽²⁷⁾ and we continue to pursue a method that will allow us to incorporate tax estimates in our resource measure from the SIPP.⁽²⁸⁾

An important note on the SIPP data: It is important to note at this point that the SIPP estimates reported herein are based on information in the 1991 panel. These estimates combine information reported every four months across the calendar year. They are weighted using the calendar year weights for 1991. Research has been done to investigate the degree of attrition bias measurable in SIPP longitudinal files,⁽²⁹⁾ particularly in the area of poverty statistics. This research suggests that there is a significant degree of this bias present in our estimates. Since research shows that people who are struggling to get along are less likely to remain in our survey, poverty estimates are biased downward in the SIPP. Huggins et al., 1995, reported that the poverty rate for the first quarter of 1991 of only "attritors" (respondents who left the panel at some point) was 15.7 percent, while the first quarter poverty rate for the complete sample was only 11.5 percent.

Currently, the 1996 panel of SIPP is a four-year panel. In an effort to ameliorate the effects of attrition bias, the Census Bureau has proposed altering the design of the SIPP to include an annual overlapping sample. The purpose of this design change would be to achieve a consistent bias from attrition from year to year by pooling three successive panels, thus allowing comparisons of poverty estimates across time. Until the current design is modified this comparison is not recommended.

III. Results

At this stage of analyzing the Panel's recommendations, poverty rates are only important as a starting point from which to examine trends and the composition of the poverty population. In this section, poverty rates using the official thresholds and resource measure for different demographic groups are compared to the poverty rates based on our implementation of the Panel's proposed method using the CPS and SIPP for 1991. We show poverty rates based on both the experimental thresholds and standardized thresholds. Standardized thresholds are computed by applying a percentage reduction to the experimental thresholds to obtain a poverty rate for the total population equal to the official rate. Standardized measures are reported here in order to facilitate an examination of the effects on the incidence of poverty using the experimental measures.

Poverty in 1991 Based on the Official and Experimental Definitions: CPS and SIPP

The poverty rates shown in Table 4, under the heading 'official definition measures,' represent the current official definitions of income and the thresholds as estimated using CPS data, and a similarly defined measure using SIPP data.⁽³⁰⁾ Annual before-tax cash income is compared against the current official poverty thresholds to determine poverty status. These estimates show that in 1991 the official poverty rate for all persons was 14.2 percent, and a similarly defined estimate in the SIPP yields a poverty rate of 12.1 percent. There are many reasons why the SIPP produces poverty rates below CPS numbers, one of those being that, as an income survey, SIPP is designed to do a more complete job of collecting income data⁽³¹⁾. Other possible factors are sub-annual changes in family compositions, accounted for in the SIPP measure, and attrition bias as discussed above. As is shown in Table 4, the measure based on the official definition results in poverty rates that are consistently lower in the SIPP than the CPS.

The experimental measures shown in Table 5 represent the poverty measure as recommended by the NAS Panel and implemented as described above. In the CPS, experimental poverty rates are higher for all groups than official rates. The overall poverty rate rises from 14.2 percent under the official measure to 18.9 percent using the experimental measure. As we saw in the resource section, there are several deductions from current money income in the new resource measure which would result in higher poverty rates. One of these is taxes paid, which is deducted from the CPS measure shown here (though not from the SIPP measure.) Another important contributor to the large difference between the experimental rate and the official measure is the subtraction of medical out-of-pocket expenditures. As we saw in the earlier section, these expenses are quite large deductions from a family's total resources. Not accounting for medical out-of-pocket expenditures in the CPS experimental resource measure, as shown later, results in a poverty rate about 4 percentage points lower than one that takes account of these expenses.

In the SIPP, the overall rate increases from 12.1 percent under the official definition to 13.6 percent under the experimental definition (see Tables 4 and 5). However, for some groups the poverty rate actually falls using the SIPP experimental resource measure; poverty rates of children, Blacks, and people in female householder families are slightly lower using the experimental measure. One source of the difference between the CPS- and SIPP-based experimental measures has to do with the value of housing subsidies, which, as was shown in an

earlier section, is much larger in the SIPP than the CPS measure. Calculating experimental poverty rates from the SIPP without incorporating the housing subsidy values results in a resource measure that is higher for all groups than the official measure. Additionally, the SIPP measure also includes benefits not accounted for in the CPS, as mentioned earlier, such as school breakfast subsidies, energy assistance, and WIC benefits.

Another important difference between the poverty estimates shown here based on the CPS and SIPP samples is that taxes are not deducted from the SIPP experimental measure. We examine the differences between a CPS resource measure with pre-tax income compared with the SIPP estimates to note the effect of after-tax income on our poverty estimates. Our calculations show that the experimental rates are lower, as expected, but that generally the poverty rates under the pre-tax measure are not changed in their relationships to the other measures presented here⁽³²⁾. General results and conclusions discussed here comparing the SIPP and the CPS measures would be unchanged by comparing pre-tax resource measures in both surveys.

Table 6 presents experimental rates from both surveys using thresholds adjusted to produce an overall poverty rate roughly equal to the official rate in 1991 of 14.2 percent. This is achieved by applying a factor of 0.845 to the experimental thresholds when using the CPS-based measure and 1.025 when using the SIPP measure. The standardized rates are an informative way to examine which groups have a differential probability to be classified as poor under the experimental measure. As is seen from Table 6, these groups include children, Blacks, people in female householder families, and those who reside in the Midwest. This is true regardless of the survey data we use. Both the CPS- and the SIPP-based measures result in lower poverty rates for these groups using the new measure relative to the official definition. People residing in the South show a lower poverty rate in the CPS measure only. All other groups listed are more likely to be classified as poor under the experimental measure. Similar to results reported by the Panel, these groups include the elderly, Whites, persons in families with at least one worker, persons in married-couple families, and those residing in the Northeast and the Western states.

Since the experimental standardized poverty rate is lower than the official rate for certain groups such as children, Blacks, and persons in female householder families, we would expect that their representation in the poverty population would be lower. The percentage distributions presented in Table 7 support this hypothesis. Here we present the composition of the total population in 1991, the 1991 poverty population using the official definition, and the experimental poverty measure based on standardized poverty rates. These data also show that the other groups, for whom experimental rates are higher, comprise a greater percentage of the poor.

Similar to previous research, using the new measure results in a poverty population that looks more like the total population for many characteristics, with some exceptions. One important difference is for the Hispanic population under the CPS experimental measure. We find that the percentage of Hispanic persons is less like their representation in the total population than under the official measure. Another difference is the geographic distribution under the experimental measure. The experimental measure, for example, shows fewer poor in the Midwest relative to the official measure and shows a slightly higher percentage of poor people residing in the South and West than does the official measure.

Poverty Estimates Over Time: CPS Standardized Experimental Measure versus the Official Measure

Thus far, we have seen how the experimental measure differs from the current official measure for a given calendar year, 1991. It is interesting to examine how this measure would behave over time had we adopted a new measure in that year. Table 8 shows that, over the 1991-96 period, rates under the official and experimental methodologies behave similarly: increasing over the 1991-93 period and decreasing over the 1993-96 period. (The table shows official poverty rates, experimental poverty rates, and standardized experimental poverty rates controlled to the 1991 official rate, and standardized experimental rates controlled to the 1996 official rate.) For these standardized measures, the experimental poverty thresholds are adjusted to produce the same rate as the official rate in a particular year. Thresholds for the remaining years in the series are adjusted by that same factor. From the data presented, we can observe that the official rate rose from 14.2 to 15.1 percent from 1991 to 1993 and fell to 13.7 percent by 1996. The NAS experimental rate rose from 18.9 to 20.2 percent in 1993 and fell to 18.0 percent in 1996. The two standardized experimental rates show very similar patterns.

Variations in Definitions of Resources and Thresholds

There are, however, several interesting differences in these trends in poverty rates over time that require further investigation. We examine some of these by varying our experimental definition slightly. Table 9 shows official poverty rates across the period and rates based on the experimental measure. A third measure uses the experimental resource measure with the official thresholds. This measure illustrates that the net effect of the experimental resource measure is to increase poverty rates considerably. Larger deductions than additions have been incorporated in the new resource measure, at least for people at the lower end of the income distribution. Another measure shown in Table 9 reverses this pattern. Using our old resource measure but new thresholds shows the net effect of the new thresholds: poverty rates fall slightly.

Finally, but perhaps most significantly, we show the experimental measure without the estimated medical out-of-pocket expenses deducted. The large effect of this deduction is observed by the fact that this measure produces rates that are very nearly equal to those based on the official measure, all other things being equal. Furthermore, the rate of increase from 1991 to 1993 of this measure more closely resembles that of the official rate. This

observation suggests that the slightly higher rate of increase in the experimental measure over this time period may be due to the increase in medical out-of-pocket expenses, as imputed, over this period. As shown earlier, the level of these expenses are adjusted to benchmark totals and resulting poverty rates are affected by these totals. For example, using an aggregate spending benchmark of \$218.5 billion (the uncalibrated aggregate amount), which is seven percent higher than the calibrated aggregate amount of \$204.3 billion which we used, results in a poverty rate of 19.3 percent, a figure two percent higher than the estimate presented here for 1991. Another difference in trends between our two measures is a slightly accelerated decline in the experimental measure from 1993 to 1996 as evidenced by the fact that the standardized experimental rates fall below the official rates by 1996 from a slightly higher level in 1993. Another measure listed in Table 9 offers an explanation. Shown there is a standardized experimental measure without the Earned Income Credit (EIC) added into resources. An examination of the trend in this measure, relative to that of the standardized experimental measure shows that the measure with the EIC falls faster than the measure without the EIC from 1993 to 1996, reflecting expansions in the EIC in 1993⁽³³⁾. This result suggests that this trend difference is due to the inclusion of the EIC in the tax measure in the CPS.

This trend difference is even more pronounced for certain groups, namely, those groups more likely to have taken advantage of the EIC. Table 10 includes poverty rates over time of various groups with and without the EIC; all other parts of the standardized poverty measure are the same. For children, Blacks, Hispanics, and persons in families with one or more workers, poverty rates dropped over the 1993-95 period. This drop appears to be due to the addition of the EIC in the resource measure. This result highlights the ability of the new measure to capture the effects of tax and some transfer policies.

IV. Further Work

Future research on poverty measurement will include refinements in the thresholds and the way in which resources are defined. Further work on the threshold side includes examining other geographic adjustments and equivalence scales. The procedure used here to adjust for geographic differences in housing prices is understandable, operationally feasible, and produces results that conform to other research. However, the procedure does not account for housing cost differences *within areas* or for quality differences. Additionally, since the choice of an equivalence scale can have large effects on the composition of the poverty population, the selection of appropriate equivalence scales must be further examined.

Adopting the SIPP as the official data source for poverty measurement, as recommended by the NAS Panel, would place special demands on the SIPP and the imputation methods used to estimate values for the additions and subtractions to obtain a SIPP-based resource measure. For example, on the resource side, perhaps the largest remaining challenge involves a calculation of taxes to arrive at an after-tax income measure in the SIPP. Work has been done in this area and additional work will incorporate the reported data available in the SIPP with a tax model similar to that already available for the CPS.

Also in the SIPP, we will continue working on the medical out-of-pocket valuations. We have demonstrated in this paper that medical out-of-pocket imputations have a great impact on poverty rates over time and on specific population subgroups at any point in time. Thus, it is imperative that we focus on the valuation methods used for this subtraction from income. In the future, we plan to statistically match new data collected in the SIPP with data collected in the 1997 Medical Expenditure Panel Survey. Also, since the imputed values of medical expenditures are sensitive to the values of the benchmark totals we use and thus affect outcomes, it is imperative that further research be conducted to specify more appropriate sources for these important inputs.

If the CPS remains the official source of data for poverty measurement, we would need to further examine methods to value in-kind benefits. For example, in the area of housing subsidies, the use of Fair Market Rents as inputs to a valuation procedure, as is done in the SIPP measure presented here, suggests the need for an accurate benchmark control. We are considering adopting this method for an experimental measure based on the CPS that are produced on a regular basis, replacing the current procedure based on 1985 AHS data.

Two more general issues for further research are the treatment of cohabitants and the treatment of the flow of services from owner-occupied housing. The Panel recommended pooling resources and the needs of cohabiting persons to determine poverty status. Some work has been done in this area, comparing poverty rates based on the official definition which uses families, as defined by the Census Bureau, with another that includes cohabiting individuals as the relevant unit of analysis⁽³⁴⁾. Changing the relevant unit for poverty analysis from the family to include persons who are cohabiting might be an important issue for some population subgroups, for example, young single people.

Accounting for the flow of services for owner-occupied housing would affect both thresholds and resources. As noted by the Panel, economists have long argued that the economic resources for owners and renters be treated comparably; how to do this remains a question for continued research. Economic resources available are related to the expenses that the household has. For example, if the household owns its home without a mortgage, then more money is available to purchase other needed goods and services although the household's consumption need for housing may not differ from that of owners with a mortgage or from that of renters. In defining thresholds for this study, we use the out-of-pocket shelter expenses reported (not including the reduction in

mortgage principal) by the reference units for both renters and owners. Other methods to estimate these costs include replacing the owners' expenses with their imputed rents. No adjustment has been made in our resource measure to account for the flow of services of owner occupied housing. In discussing the treatment of home ownership on the resource side, Betson (1995b) states that assigning an imputed rental value to homeowners may understate a homeowner's needs if the homeowner has a mortgage and overstate the homeowner's needs if the homeowner does not have a mortgage. The results presented by Johnson et al. (1997), concerning the valuation of shelter costs for the thresholds, suggest that this may indeed be the case. Basic questions that still need to be addressed are whether the poverty threshold should allow for ownership of housing or just for a flow of services for comparable housing, and if so, how to treat this flow of services on the resource side. Finally, on a broader note, a complication for poverty measurement has to do with welfare reform. At a time when we are attempting to incorporate government transfers, both cash and in-kind, into our poverty measure, these transfer programs are changing dramatically across the states. Capturing these changes and, further, attempting to value new arrays of benefits presents an exceptional challenge.

References

- Bauman, Kurt, "Shifting Family Definitions: The Effect of Cohabitation and Other Non-family Household Relationships on Measures of Poverty," paper presented at IRP Small Grants Conference, May 1996.
- Betson, David, "The Effect of Home Ownership on Poverty Measurement," Office of Assistant Secretary of Planning and Evaluation, Department of Health and Human Services, unpublished manuscript, 1995a.
- Betson, David, "Poor Old Folk: Have Our Methods of Poverty Measurement Blinded Us to Who is Poor?," University of Notre Dame, unpublished paper, 1995b.
- Betson, David, "Imputing Medical Out-of-Pocket Expenditures from NMES Data," University of Notre Dame, memo, December 1997a.
- Betson, David, "In Search of an Elusive Truth, 'How Much Do Americans Spend on Their Health Care?'," University of Notre Dame, unpublished manuscript, April 7, 1997.
- Bureau of Labor Statistics, **Urban Family Budgets and Comparative Indexes for Selected Urban Family Budgets and Comparative Indexes for Selected Urban Areas**. USDL 82-139. Washington, D.C., Autumn 1982.
- Carlson, Marcia and Sheldon Danziger, "Cohabitation and Child Poverty," University of Michigan manuscript, December 1996.
- Census Bureau, **Measuring the Effect of Benefits and Taxes on Income and Poverty: 1979 to 1991**, Washington, D.C., August 1992.
- Census Bureau, **Poverty in the United States: 1996**, Washington, D.C., September 1997.
- Citro, Connie F. and Robert T. Michael (eds.), **Measuring Poverty: A New Approach, Washington, D.C.: National Academy Press, 1995**.
- Coder, John and Lydia Scoon-Rogers, "Evaluating the Quality of Income Data Collected in the Annual Supplement to the March Current Population Survey and the Survey of Income and Program Participation," SIPP Working Paper 215, July 1996.
- Dickert, Stacy, Scott Houser, and John Karl Scholz, "Taxes and the Poor: A Microsimulation Study of Implicit and Explicit Taxes." **National Tax Journal** 47, September 1994.
- Doyle, Patricia, "How Do We Deduct What We Do Not Collect?," paper presented at the annual meeting of the American Statistical Association, August 1997.
- Garner, Thesia I., Stephanie Shipp, Geoffrey Paulin, Kathleen Short, and Charles Nelson, "Poverty Measurement in the 1990s," **Monthly Labor Review**, (forthcoming).
- Huggins, Vicki J. and Franklin Winters, "Income and Poverty Time Series Data from the Survey of Income and Program Participation," paper presented at the annual meeting of the American Statistical Association, August 1995.
- Johnson, David, Stephanie Shipp, Thesia I. Garner, "Developing Poverty Thresholds Using Expenditure Data," paper presented at the annual meeting of the American Statistical Association, August 1997.
- Naifeh, Mary and T.J. Eller, "Valuing Housing Subsidies in a New Measure of Poverty: CPS", paper presented at the annual meeting of the American Statistical Association, August 1997.
- Renwick, Trudi J., "Budget-Based Poverty Measurement: 1992 Basic Needs Budgets for American Families," **Proceedings of the Social Science Statistics Section of the American Statistical Association**, Alexandria, Va., American Statistical Association, 1993.
- Ruggles, Patricia, **Drawing the Line--Alternative Poverty Measures and Their Implications for Public Policy**, Washington, D.C.: Urban Institute Press, 1990.
- Schwarz, John E. and Thomas J. Volgy, **Forgotten Americans**, New York: W.W. Norton and Company, 1992.
- Shea, Martina, Mary Naifeh, and Kathleen Short, "Valuing Housing Subsidies in a New Measure of Poverty: SIPP," paper presented at the annual meeting of the American Statistical Association, August 1997.

Short, Kathleen, Martina Shea, and T.J. Eller, "Work-Related Expenditures in a New Measure of Poverty," paper presented at the annual meeting of the American Statistical Association, August 1996.
Steffick, Diane, unpublished memorandum, The Urban Institute, Washington, D.C., 1993.

Footnotes:

1. Short and Shea are in the Housing and Household Economic Statistics Division of the Census Bureau. Johnson and Garner are in the Division of Price and Index Number Research, Bureau of Labor Statistics. This paper is not an official report of the Bureau of the Census or the Bureau of Labor Statistics. It presents research which supports the official work of these agencies. Responsibility for any errors remains with the authors.
2. Garner et al., 1998 and Johnson et al., 1997.
3. Citro and Michael, 1995 and Garner et al., 1998.
4. Citro and Michael, 1995, p. 149.
5. For example see Renwick, 1993, pp. 573-582; Bureau of Labor Statistics, 1982; Schwarz and Volgy, 1992.
6. The Panel set this share at 44 percent.
7. Johnson et al., 1997 found that these indexes produced similar results to those using inter-area price indexes that account for more expenditure categories.
8. The choice of equivalence scale can have substantial effects on the distribution of poverty (see Citro and Michael, 1995 and Johnson et al., 1997.)
9. Citro and Michael, 1995, p. 7.
10. See USDL1 for definition of consumer unit.
11. Other issues considered by Johnson and colleagues included which consumer units to include in the estimation, how to define shelter expenditures, how to adjust for geographic costs differences, and which equivalence scale to use.
12. Department of Agriculture unpublished data.
14. For more detail on this method see Naifeh et al., 1997, Census Bureau, 1992, and 1997.
15. Countable income is the income defined by the Department of Housing and Urban Development to establish eligibility for housing programs. This is defined as gross annual income (excluding a few resources, such as earnings of children, foster care payments, educational scholarships, and lump sums) minus various expenses such as medical and work-related expenses and including proportions of net family assets.
16. The Panel recommended using housing cost data reported in the SIPP in our subsidy calculation. We have not incorporated these data in the subsidy amounts used here. See Citro and Michael, 1995, p. 223.
17. Experimental poverty estimates which take account of housing subsidies in measuring resources have been published annually using the Current Population Survey (Census Bureau, 1997).
18. Amounts based on verbal communication from staff in the Budget Office at Department of Housing and Urban Development. This figure includes spending for low income housing assistance (section 8), rent supplements, rent housing assistance (section 236), and public housing. It excludes home ownership assistance and college housing expenditures.
19. Steffick, 1993, and Citro and Michael, 1995, p. 223.
20. Citro and Michael, 1995, p. 243.
21. We have included a work-related expenses module in the third wave of the 1996 SIPP panel. These questions will be repeated in the sixth wave of the same panel.
22. This valuation method differs from that used in the Panel's report.
23. Child care expenses are restricted to the earnings of the single parent or the earnings of the parent with the lower earnings in a two-parent family in the CPS but not the SIPP.
24. See Betson, 1995, 1997 and Doyle 1997 for a description of this method.
25. Betson, 1995.
26. See Census Bureau, 1997 or 1992, for a more detailed description of these methods.
27. Dickert et al., 1994.
28. Appendix Table A shows estimates of poverty rates based on a resource measure without taxes deducted.
29. Huggins et al., 1995.
30. Official U.S. poverty estimates come only from the CPS.
31. Coder and Scoon-Rogers, 1996.
32. See Appendix Table A for these estimates.
33. Legislation enacted in 1993 extended a small credit to poor non-elderly workers without children and increased the basic benefit for families with more than one child.
34. Bauman, 1996 and Carlson and Danziger, 1996.