

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

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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 (Constance F. Citro and Robert T. 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 a number of the Panel's basic procedures, with slight modifications, to obtain experimental poverty rates for 1991 to 1996.<sup>1</sup>

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

Our findings reveal that changes in the poverty rates based on the official and the experimental measures are similar over time. We show that poverty rates using SIPP data are below those using the CPS. 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 does the poverty population based on the current official measure.

## I. Defining the Thresholds

The Panel recommended that the poverty thresholds should be based on a percentage of the median expenditures for a basic bundle which includes food, clothing, shelter, and utilities. A small multiplier is applied to this value to account for other needs (e.g., household supplies, personal care). The actual expenditures of a consumer unit, comprising two adults and two children, from the CEX data are used. Following Garner et al. (1998) we use the average of upper and lower values for the percentages and multipliers to obtain a poverty threshold for the reference unit (shown in Table 1). The resulting threshold is very close to median expenditures on the basic bundle. We update the threshold from 1991 using the CPI-U. While the Panel recommended updating by the change in median expenditures each year, Johnson et al. (1997) showed that the change in median expenditures were similar to the inflation rate over this entire period, but the annual changes were more volatile than the inflation rate.

The reference threshold is adjusted to reflect geographic differences in costs, using inter-area housing price indexes based on data from the 1990 Census on gross rent for apartments (as did the Panel). We use a two-parameter equivalence scale that accounts for the differ-

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<sup>1</sup> For a more comprehensive version see:

<http://www.census.gov/www/hhes/povmeas.htm>

TABLE 1—POVERTY THRESHOLDS FOR UNITS COMPRISING TWO ADULTS AND TWO CHILDREN

Year	Poverty threshold (\$)	
	Official	Experimental
1991	13,812	13,891
1992	14,228	14,309
1993	14,654	14,738
1994	15,029	15,115
1995	15,455	15,543
1996	15,911	16,002

ing needs of adults and children and the economies of scale of living in larger families. 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 economies of scale. We use  $P = 0.7$  and a scale economy factor  $F = 0.65$ , since these scales minimize the effect on overall poverty and are most similar to the current scales; however, different equivalence scales can change the composition of poverty (see Citro and Michael, 1995; Johnson et al., 1997).

## 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 taxes, child-support paid, and work-related expenditures. We use the following in-kind valuation methods:

- (i) Food stamps, reported face value;
- (ii) School lunch, reported receipt, imputed value;
- (iii) School breakfast, reported receipt, imputed value in SIPP;
- (iv) Housing subsidies, Department of Housing and Urban Development's fair-market rents in SIPP (see Martina Shea et al., 1997), modeled in the CPS (see Census Bureau, 1997);
- (v) Energy assistance, reported in SIPP;
- (vi) Women, Infants, and Children Program (WIC), reported in SIPP.

Benefits from WIC, school-breakfast, and energy-assistance programs are added to the SIPP resource measure but not the CPS measure. Not including these three benefits increases the standardized experimental poverty rate by 0.2 percentage points in the SIPP measure.

From the cash and in-kind transfer total we subtract the following expenses:

- (i) Work-related transportation and miscellaneous expenses, a fixed amount per week per working adult, not to exceed earnings;<sup>2</sup>
- (ii) Child-care expenses, reported in SIPP and imputed to the CPS (see Short et al., 1996);
- (iii) Medical out-of-pocket expenditures, imputed in both surveys (see David Betson, 1997a, b; Patricia Doyle, 1997);
- (iv) Taxes, imputed in the CPS;
- (v) Child-support paid, reported in SIPP.

Our treatment of the last two elements differs between the two surveys. In the CPS, taxes paid are modeled in every year, including the value of the Earned Income Credit (EIC) received. The SIPP collects information on taxes paid in an annual tax module; we are currently evaluating these data to develop a tax estimation procedure for the SIPP. For the purpose of this paper, we do not subtract taxes from income for the SIPP analysis. Our calculations show that accounting for taxes in our standardized experimental CPS measure increases the poverty rate by about 1.0 percentage point. Further, information on child-support payments are not available in the CPS and, therefore, are not included in the CPS estimates reported here. Calculations show that accounting for child-support paid in the SIPP experimental measure increases the poverty rate by less than 0.1 percentage point.

## III. Results

At this stage of analyzing the Panel's recommendations, poverty rates are important

<sup>2</sup> The Panel estimate of \$14.42 for 1992 was price-adjusted for other years.

TABLE 2—POVERTY RATES, 1991 (PERCENTAGE POOR)

Sample	NAS experimental measure					
	Official definition		Standardized		Nonstandardized	
	CPS	SIPP	CPS	SIPP	CPS	SIPP
All persons	14.2	12.1	14.2	14.2	18.9	13.6
Children	21.8	19.6	19.9	20.0	26.4	18.9
Elderly	12.4	9.0	14.9	15.3	20.3	14.5
White	11.3	9.3	12.1	12.0	16.1	11.5
Black	32.7	29.0	27.4	28.4	36.7	26.8
Hispanic	28.7	27.6	30.6	30.8	40.0	29.5
One or more workers	9.3	6.6	10.4	9.6	14.3	9.0
Married-couple families	7.2	6.3	8.3	9.3	11.9	8.8
Female-householder families	39.7	35.5	35.7	35.2	45.0	33.6

as a starting point from which to examine trends and the composition of the poverty population. In Table 2, 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 SIPP and CPS for 1991. As shown, poverty rates using the official definition with SIPP data are smaller than official CPS-based poverty rates.<sup>3</sup> In order to examine the effects on the composition of the poverty population, we adjust the experimental thresholds by a percentage of the threshold to obtain an overall poverty rate equal to the official rate. The standardized rates in Table 2 show that children, blacks, and people in female-householder families are less likely to be classified as poor under the new measure, while all other groups shown are more likely to be classified as poor.

Since the experimental standardized poverty rate is lower than the official rate for children, blacks, and persons in female-householder families, we would expect that their representation in the poverty population would be lower, and vice versa for those with higher

TABLE 3—PROPORTION OF THE POPULATION BY CHARACTERISTIC, 1991 (PERCENTAGES)

Sample	Poverty population					
	Total population		Official definition		NAS experimental measure, standardized	
	CPS	SIPP	CPS	SIPP	CPS	SIPP
Children	26.2	26.9	40.2	43.9	36.8	37.7
Elderly	12.2	11.5	10.6	8.6	12.8	12.4
White	83.7	83.3	66.5	64.2	71.2	70.3
Black	12.5	12.5	28.7	30.1	24.1	24.9
Hispanic	8.8	9.3	17.8	21.2	18.9	20.0
One or more workers	84.5	82.0	54.9	45.1	61.7	55.2
Married-couple families	79.7	80.3	44.8	44.7	50.6	54.2
Female-householder families	16.4	16.6	50.9	52.2	44.4	42.4

rates. As seen in previous research, using the new measure results in a poverty population that more closely resembles the total population. This is illustrated in Table 3, which shows the composition of the total population versus that of the poverty population under the different measures.

Finally, Table 4 shows that over the 1991–1996 period, rates under the official and experimental methodologies behave similarly, increasing over the 1991–1993 period and decreasing over the 1993–1996 period. The table shows standardized experimental poverty rates calibrated to the 1991 official rate. The official rate rises from 14.2 percent to 15.1 percent from 1991 to 1993 and falls to 13.7 percent by 1996.<sup>4</sup> The standardized experimental rate rises from 14.2 percent to 15.4 percent from 1991 to 1993 and falls to 13.4 percent by 1996. However, over the 1993–1996 period, poverty rates drop more under the experimental measure for some

<sup>3</sup> SIPP was designed to do a more complete job of collecting income data than the CPS.

<sup>4</sup> Controlling the experimental measure to match the official poverty rate in 1996 instead of 1991 shows the same pattern: an increase from 14.5 percent in 1991 to 15.7 percent in 1993, followed by a reduction to 13.7 percent in 1996.

TABLE 4—POVERTY RATES, 1991–1996, CPS  
(PERCENTAGE POOR)

Sample	1991	1992	1993	1994	1995	1996
<i>Official Measure:</i>						
All persons	14.2	14.8	15.1	14.6	13.8	13.7
Children	21.8	22.4	22.7	21.8	20.8	20.5
Elderly	12.4	12.9	12.2	11.7	10.5	10.8
White	11.3	11.9	12.2	11.7	11.2	11.2
Black	32.7	33.4	33.1	30.6	29.3	28.4
Hispanic	28.7	29.6	30.6	30.7	30.3	29.4
One or more workers	9.3	9.7	9.9	9.6	9.5	9.5
Married-couple families	7.2	7.7	8.0	7.4	6.8	6.9
Female-householder families	39.7	39.0	38.7	38.6	36.5	35.8
<i>NAS Experimental Measure (Standardized):</i>						
All persons	14.2	15.0	15.4	14.3	13.4	13.4
Children	19.9	20.7	21.0	19.3	17.8	17.7
Elderly	14.9	16.1	16.2	15.7	14.6	15.2
White	12.1	12.7	12.9	12.3	11.5	11.5
Black	27.4	29.2	30.1	25.2	24.6	24.5
Hispanic	30.6	31.1	31.0	30.1	28.0	27.8
One or more workers	10.4	10.7	11.1	10.2	9.7	9.7
Married-couple families	8.3	9.1	9.2	8.3	7.6	7.6
Female-householder families	35.7	35.3	35.2	34.1	31.3	31.6

groups, such as children and blacks. This drop appears to be due to the addition of the Earned Income Credit in the resource measure. This result highlights the ability of the new measure to capture the effects of many tax and transfer policies.

#### IV. Next Steps

Future poverty-measurement research will address 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. While the procedure used here to adjust for geographic differences in housing prices is understandable and operationally feasible, it 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.

On defining resources or “income,” the largest remaining challenge involves calculating taxes to arrive at an after-tax income measure in the SIPP. Other work involves further examination of the imputation procedures used to produce the medical out-of-pocket and housing-subsidy values. Because aggregate imputed values are calibrated to benchmark totals, outcomes are quite sensitive to changes in these totals. Finally, new data collected in the SIPP this year, which allows a statistical match to the Medical Expenditure Panel Survey, may result in improved methods of valuing this element of the measure of resources.

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