Experimental poverty measurement for the 1990s

Recently, a National Academy of Sciences Panel made recommendations for a revised poverty measure; when implemented in a test enviroment, these recommendations yield a poverty population that looks more like the general population, in that the poor are more likely to be white, to be married, and to have a family member in the labor force

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The last 30 years have seen fundamental social and economic changes in the United States. Today, there are more working mothers, families are smaller, there are wider varieties of goods and services, expectations about what it takes to meet one's needs are greater than in the past, and beliefs about what are necessities have changed. Geographic variations in housing and the increasing importance of government programs also have influenced families' appraisals of the value of their disposable incomes.[1] With these and related changes have come questions about whether the measures and data used to produce various economic statistics are still meaningful. Among the measures frequently criticized is that for poverty.

The most recent comprehensive examination of poverty measurement in the United States was conducted by the National Research Council of the National Academy of Sciences Panel on Poverty and Family Assistance in the early 1990s. In 1995, this Panel of scholars published its findings in a report entitled *Measuring Poverty: A New Approach.*[2] Included in the report are recommendations for a new poverty measure, along with examples of ways in which the recommendations might be implemented. According to the Panel, any new poverty measure should better reflect social and economic changes, and should be based on a level of family economic resources considered necessary to provide a minimally adequate standard of living, defined appropriately for the Nation.

The Panel's minimally adequate standard of living would include a basic needs commodity bundle (food, clothing, shelter, and utilities), plus a small additional amount to allow for other needs (such as household supplies, personal care, and nonwork-related transportation). Family economic resources would be defined as the sum of money income from all sources and near-money benefits from government transfer programs (such as food stamps and subsidized housing) that could be used to buy the commodities in the full needs bundle, less expenses that could not be used to buy these commodities.[3] If a family could not meet its needs for these commodities with its available economic resources, it would be considered poor. (See the box on pp. 53–55 for a summary of the general recommendations.)

In this article, we test the Panel's basic proposed procedure and examine additional Panel recommendations. We identify our poverty measures based on the additional recommendations as "experimental," in contrast to the official poverty measure and the measure published by the Panel. For purposes of this study, we take the initial recommendations as they are presented, and do not attempt to justify the Panel's recommended procedure or evaluate its advantages and disadvantages. The analysis that follows resulted from a joint project between the Bureau of the Census and the Bureau of Labor Statistics, the two U.S. Government statistical agencies that are most likely to be involved in producing any new poverty measure.[4]

See author identification on page 56.

Background

In order to produce poverty statistics, a poverty concept must be selected and resources defined. The concepts most often used for poverty measurement are identified as absolute, relative, or subjective.[5] An *absolute* measure reflects some standard below which, it is believed, basic needs cannot be met. Absolute measures often require a large number of judgments about an approved set of expenditures for the poor. The current U.S. official poverty threshold is assumed to reflect some absolute minimum.[6] A *relative* poverty concept is based on the relative position of households or individuals within a distribution (usually of income or expenditures) as a crucial determinant of poverty status. Such measures, which explicitly set the poverty threshold based on judgment, are most often used in Europe and for cross-national comparisons.[7] *Subjective* measures are based upon the notion that the opinions of people about their own situations (such as their feeling about the income level minimally necessary to make ends meet) should ultimately be the decisive factor in defining poverty. In Belgium, subjective poverty thresholds have been used as instruments to measure differences and changes in adequacy, although they are not used to measure poverty officially.[8]

The U.S. poverty thresholds, originally developed in 1963, were based on an explicit concept of need. Mollie Orshansky, of the Social Security Administration, derived what became known as the poverty thresholds from the Economy Food Plan (developed in 1961 by the U.S. Department of Agriculture) and data from the 1955 U.S. Department of Agriculture Household Food Consumption Survey. The Plan was adapted to the food patterns of lower income families, and was developed to provide a nutritionally balanced diet. (However, Gordon Fisher has observed that the Economy Food Plan was to be for "temporary or emergency use when funds are low."[9]) The dollar costs of the food plan were produced for families of different sizes and compositions. Minimum total living costs were computed by multiplying the dollar value of the minimum food plan by 3, because the average family of three or more persons spent about one-third of its average money income after taxes on food. This multiplier was based on the relationship between food expenditures and total after-tax money income of the entire population, as estimated using data from the 1955 Household Food Consumption Survey. The thresholds for families of other sizes were derived in a slightly different way.[10]

The Panel suggested that one of the reasons the Orshansky thresholds were adopted as official poverty measures is because of their relationship to other related measures at the time: the original 1963 threshold for a two-adult, two-child family was very close to one-half the median after-tax income for a four-person family, and to a subjective four-person family threshold derived from Gallup Poll data. Thus, the U.S. poverty measure, as originally conceived, did have components of absolute, relative, and subjective poverty measures.[11]

The Social Security Administration (SSA) began publishing poverty statistics in 1963 based on Orshansky's work. In 1965, the Office of Economic Opportunity adopted the SSA thresholds for statistical and program planning purposes. In August 1967, the Census Bureau took over publishing official annual statistics on the number and proportion of the poor; these measures were based on comparisons of the SSA thresholds with estimates of families' before-tax money income from the March Current Population Survey. In 1969, the U.S. Bureau of Budget (now the Office of Management and Budget) issued a statistical policy directive that gave the thresholds official status throughout the Federal Government.

As noted above, the current U.S. poverty threshold is considered an absolute threshold (although not originally developed as such) and is based on the cost of a minimum food diet, along with a multiplier for other expenses. Each year since 1963, when the United States officially began to produce poverty statistics, the same basic poverty concept has been used. However, a few changes have been introduced over time. The primary change each year is the updating of the thresholds to reflect price changes. Among the set of original thresholds, separate ones were produced for families headed by women and men, and for families living in farm and nonfarm areas. The male-female and farm-nonfarm distinctions were dropped in 1981; however, at the same time, the matrix of thresholds was extended to include families of nine persons or more rather than seven or more.[12]

The definition of poverty currently used in the United States is based on the comparison of inflation-adjusted thresholds to gross (pretax) annual money income. A family is identified as poor if its total annual gross money income is below its annual poverty threshold. The official definition of income for poverty measurement has not changed over time, but researchers at the Census Bureau have been experimenting with alternative measures of income for several years.[13] Such alternative income definitions have accounted for noncash benefits and the deduction of income taxes.

The Department of Health and Human Services uses the official poverty thresholds to produce annual poverty guidelines. These guidelines are obtained by smoothing the official thresholds for families of different size. The poverty guidelines are often used to determine the eligibility of families to participate in government programs designed to help those whose resources fall below some standard of need.[14]

In *Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy*, published in 1990, Patricia Ruggles addressed alternative concepts of poverty and methods for measuring poverty, and also proposed methods to update and revise the poverty threshold and resource

definitions.[15] The Joint Economic Committee held congressional hearings on these matters in the early 1990's,[16] in response to Ruggles' book and her related activities on the Committee staff. As a result of those hearings, the Panel on Poverty and Family Assistance, chaired by Robert T. Michael, was given the responsibility to conduct the review. As noted earlier, the Panel issued its final report, entitled *Measuring Poverty: A New Approach*, in 1995.[17]

Highlights of the Panel report

As did Ruggles, the Panel recommended revising the current poverty measure to reflect trends in poverty over time and differences in the incidence of poverty among different demographic groups. The new measure would retain the current notion of poverty as reflecting material deprivation; however, a revised set of thresholds and a revised definition of resources would be used to identify the poor. The revised thresholds and resource definitions would reflect social and economic changes. This is in contrast to the method currently followed for updating the official poverty thresholds, which allows only for changes in prices, and not for changes in consumption patterns over time. The Panel's aim was to propose a *procedure* to follow. Rather than recommending an absolute, relative, or subjective measure, the Panel proposed a *hybrid* poverty measure that includes aspects of both the absolute (budget-based) and relative concepts.[18]

In general, the Panel's recommendations addressed eight major tasks[19]: (1) adopting a new poverty measure; (2) setting and updating the poverty threshold; (3) adjusting the threshold for family type and geographic differences; (4) defining family resources; (5) identifying needed data; (6) highlighting other issues related to poverty measurement; (7) relating poverty measurement to assistance programs; and (8) linking States' needs to the Panel's proposed measure. The basic criteria for developing the poverty measure are that it should be:

- understandable and broadly acceptable to the public;
- statistically defensible (for example, internally consistent); and
- operationally feasible.[20]

The Panel used recent data and applied results from scientific studies in developing its recommendations. However, Panel members did make subjective decisions at various times in the process.[21]

Panel procedures and findings

Defining the thresholds. With reference to the poverty thresholds, the Panel stated generally that[22]:

- The poverty thresholds should represent a budget for food, clothing, shelter (including utilities), and a small additional amount for other needs (such as household supplies, personal care, and nonwork-related transportation).
- A threshold for a reference family type should be developed using actual Consumer Expenditure Survey data and updated annually to reflect changes in expenditures on food, clothing, and shelter over the previous 3 years.
- The reference family threshold should be adjusted to reflect the needs of different family types and differences in housing costs among geographic areas.

Weighted expenditure data from the 1989–91 Consumer Expenditure Interview Survey were used to produce the poverty thresholds presented in the Panel's report. Expenditures for a basic bundle of commodities composed of food, clothing, shelter, and utilities[23] were obtained from the expenditure survey data for a reference family type, defined to include two adults and two children.[24] The Panel criteria called for a reference family to "fall near the center of the family size distribution rather than at one of the extremes…also, it is preferable for the reference family to be one that accounts for a relatively large proportion of the population because its spending patterns observed in a sample survey will be the basis for the poverty threshold…."[25] The two-adult, two-child family met these criteria.

Multipliers were applied to the basic bundle to add a small amount for other needs, such as housekeeping supplies, personal care, and nonwork-related transportation. Two sets of thresholds were produced, with one allowing for greater "other needs" than the other. Thresholds for additional family types were derived by applying an equivalence scale to reflect differences in family composition and needs. These thresholds were then adjusted to account for differences in the cost of housing in metropolitan and nonmetropolitan areas in the country, using data from the 1990 census. The Panel used a modified version of the Department of Housing and Urban Development methodology for developing fair market rents to produce interarea housing price index values. Index values were constructed for metropolitan areas in six population size categories, and for nonmetropolitan areas (not distinguished by size) in each of the nine census regions.[26] (See appendix A.)

Expenditures were defined as the transaction costs, including excise and sales taxes, for those commodities acquired during the interview period. They included outlays for gifts, but excluded the value of purchases or portions of purchases directly attributable to business purposes. Also excluded were periodic credit or installment payments on commodities already acquired. Expenditures for vehicle purchases included the net outlays (purchase price minus trade-in value) on new and used cars and trucks, and expenditures for other vehicles.

For owned housing, neither the purchase price of the housing nor the mortgage principal payment was included in expenditures; however, mortgage interest and related charges were included. (The Panel noted that this definition of the shelter costs for homeowners was used for processing convenience.[27])

The Panel stated that the "...food, clothing, and shelter [including utilities] component of the reference family poverty threshold under the proposed concept must be expressed as a percentage of median expenditures on these categories."[28] This requirement reflects the *relative* component of the hybrid poverty measure. The Panel's procedure for creating a time series of thresholds involves picking a percentage of median expenditures for food, clothing, and shelter (the basic bundle) and a multiplier. The multiplier would be applied to the food, clothing, and shelter (including utilities) component of the poverty threshold so as to allow a small fraction for other needed expenditures. With this information, a base-year threshold would be established first, and the same percentage and multiplier would then be used to produce the thresholds for all other years. The only requirement for each year would be the production of median expenditures for food, clothing, shelter, and utilities.[29] The intent underlying this procedure was to drive the change in the thresholds by changes in median spending on food, clothing, shelter, and utilities, and not by changes below the median.[30] The Panel recommended that the thresholds be updated annually, using an average of the most recent 3 years of expenditure survey data to produce the medians. The 3-year average approach was devised to increase the sample size and to smooth out year-to-year changes in the thresholds; however, this approach also produces thresholds that lag behind changes in real consumption.[31]

The Panel based its analyses on data from consumer units[32] participating in the Consumer Expenditure Survey in 1989–91. (See appendix B for a description of the expenditure survey.) Each quarter, data for approximately 5,000 consumer units are are obtained in the Interview portion of the expenditure survey. Based on the 1989–91 survey data, about 9 percent of all consumer units interviewed have the characteristics of the Panel's reference family—that is, they are two-adult, two-child families. The Panel assumed that the quarterly interviews are independent, and produced annual expenditures by multiplying each consumer unit's record of expenditures by 4. All expenditures were converted to 1992 constant U.S. dollars. For example, if the collection quarter of the data occurred sometime during 1989, the 1989 expenditures were updated using the change in overall prices between 1989 and 1992.

The Panel ranked consumer units based on expenditures for the basic bundle, and placed each consumer unit into 1 of 20 equal groups, or vingtiles,[33] for which means for the basic bundle and percentages of the median were produced. For example, consumer units between the 2.5th percentile and the 7.5th percentile (based on the weighted sample sorted by the sum of expenditures on food, clothing, shelter, and utilities) were used to represent the 5th percentile; those between the 47.5th and 52.5th percentiles were used to represent the median, or 50th percentile. The mean expenditures for each of the vingtiles were divided by the mean expenditures at the computed median to produce the percentages of the median. The Panel used the means of the vingtiles for their estimates, rather than the percentile values for the consumer unit at each vingtile, thereby increasing the sample size for each vingtile and the probability that the data were consistent over time. (We use this same procedure to construct our experimental poverty measures.)

As noted earlier, multipliers were applied to the value of the designated basic bundle (specified as some percentage of the median of the basic bundle) to account for the additional costs of other needed commodities. The two bundles considered by the Panel reflect expenditures for: (1) the basic bundle plus those for personal care and one-half of transportation[34]; and (2) the basic bundle plus personal care, one-half of transportation, education, and reading materials costs.[35] In its report, the Panel stated that "we arbitrarily chose to exclude one-half of transportation costs because the Interview Survey does not distinguish between work expenses, which we propose to deduct from resources, and personal transportation for errands, vacations, etc."[36] This allocation is consistent with other studies.[37]

The Panel's determination of what to include in the additional amount was constrained by the availability of data from the Interview portion of the expenditure survey. (Some personal care items and household supplies, which would seem natural candidates for inclusion in the multiplier bundle, are available only from another portion of the expenditure survey, known as the Diary survey.) However, it is also important to note that the Panel did not intend to engage in a detailed budget-building exercise; it simply wanted to try out a couple of reasonable multipliers to get a feel for a reasonable range for a small multiplier applied to a basic bundle.[38] Other commodity bundles could have been assumed.

The Panel concluded from a review of its tabulations that a reasonable range for the multiplier was 1.15 to 1.25, which allowed for a poverty threshold that ranged from $13,700 to $15,900 (in 1992 dollars, rounded). The lower value is 78 percent of median expenditures for the basic bundle (corresponding to the 30th percentile) times 1.15, and the upper value is 83 percent of the median for the basic bundle (corresponding to the 35th percentile) times 1.25. The Panel chose its multipliers to correspond with those at or below the median level of expenditures for the basic bundle. This range of multipliers compared favorably with those estimated in other studies,[39] which range from 1.14 to 1.30. (The calculation method is described in appendix C, using our definitions of

expenditures as an example.) The general formula for deriving the proposed reference family threshold is

$$T = \left[\frac{(M_1 * P_1 E_m) + (M_2 * P_2 E_m)}{2} \right] * \text{housing index} \quad (1)$$

where T = the reference family poverty threshold;
M_1 = the multiplier for a smaller additional amount;
M_2 = the multiplier for a larger additional amount;
P_1 = a lower percentage of expenditures;
P_2 = a higher percentage of expenditures; and
E_m = median expenditures for the basic bundle of food, clothing, shelter, and utilities.

Next, the thresholds were adjusted to reflect geographic differences in the price of housing.[40] For this purpose, the Panel used interarea housing price indexes, calculated from 1990 census data on gross rent for apartments with specified characteristics, and adjusted to reflect the share of housing in the proposed poverty budget.[41]

Equivalence scale adjustments were then made to the reference family's threshold to account for the differing needs of adults and children and the economies of scale of living in larger families. After evaluating the equivalence scale implicit in the poverty thresholds and several forms of the thresholds, the Panel recommended a scale of the following type:

$$\text{scale value} = (A + pK)^f \quad (2)$$

where A = the number of adults in the family;
K = the number of children, each of whom is treated as a proportion (p) of an adult;
p = the weight assigned to each child relative to each adult; and
f = the scale economy factor.

Specifically, the Panel recommended that p be set at 0.7, such that the needs of a child are treated as 70 percent of those of an adult, and that the scale economy factor, f, be set in the range of 0.65 to 0.75. The values of the resulting scale are consistent with the Rothbarth scales reported elsewhere by David M. Betson and Robert T. Michael.[42] The equivalence scale implicit in the current poverty thresholds has been criticized for the way in which it varies across family size, and for the distinction it makes between elderly and nonelderly families.[43] The variation across family size is due to irregularities in the economies of scale. Use of the scales proposed by the Panel smoothes out these irregularities while producing thresholds that are reasonably close to the official thresholds; hence the Panel's assertion that its proposed method is the "most defensible of existing methods."[44] Equivalence scales implied by the official poverty threshold and the two scales proposed by the Panel are presented in table 1.[45] The scales recommended by the Panel improve on the current official scale but do not "represent a great departure from the current implicit scale for particular population groups."[46]

The Panel produced three sets of thresholds using (1) a $13,175 reference family threshold to keep the overall poverty rate at 14.5 percent; (2) a $14,800 reference family threshold and a scale economy factor of 0.75; and (3) a $14,800 reference family threshold and a scale economy factor of 0.65. The $14,800 threshold is the midpoint of the range noted above—$13,700–$15,900, based on rounding—that the Panel suggested as reasonable for the thresholds in 1992.

Defining resources. As noted earlier, under the definition of poverty currently used in this country, a family is defined as poor if its resources, defined as its gross (pretax) annual money income, are below the annual poverty threshold. In making recommendations for a redefined U.S. poverty measure, the Panel advocated sweeping changes to the definition of

Table 1. Current and alternative equivalence scales for families of selected types, expressed relative to a value of 1.00 for a married couple with two children

Family type	Implicit in current official thresholds[1]	0.65 scale economy factor	0.70 scale economy factor	0.75 scale economy factor
One adult[2]	0.513	0.451	0.425	0.399
Plus one child	.680	.637	.616	.595
Plus two children	.794	.797	.784	.770
Plus three children	1.003	.942	.937	.933
Plus four children	1.159	1.075	1.081	1.087
Plus five children	1.293	1.200	1.217	1.234
Married couple	.660	.708	.690	.672
Plus one child	.794	.861	.851	.841
Plus two children	1.000	1.000	1.000	1.000
Plus three children	1.177	1.129	1.140	1.151
Plus four children	1.318	1.251	1.273	1.295
Plus five children	1.476	1.367	1.400	1.434

[1] The thresholds for single adults or unrelated individuals and for two-adult families are those for units with the householders under age 65.

[2] For the one-adult unit, includes people living alone and with others in a household not related to them.

SOURCE: Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 3–4, p. 181; and the authors' own calculations. The Panel proposed that the scale be set in the range of 0.65 to 0.75. A 0.70 scale economy factor is used in this article.

resources used to determine poverty status. In deciding how to measure resources, the Panel noted that "researchers argue that it is preferable, for a combination of theoretical and empirical reasons, to look at what families actually consume."[47] The Panel carefully evaluated this concept,[48] and concluded that "the measurement of poverty in the United States must continue, at least for some years, to be based on an income definition of resources . . . we urge work on improving the Consumer Expenditure (CE) Survey so that it would be possible to consider seriously the use of consumption- or expenditure-based definition of family resources for measuring poverty in the future."[49] Thus, the Panel recommended that resources be defined as the sum of money income from all sources, together with the value of near-money benefits, minus expenses that cannot be used to buy these goods and services. The new measure would be calculated as follows:[50]

- estimate gross money income from all public and private sources for a family of related individuals (which is income as defined in the current measure);
- add the value of in-kind government subsidies (such as food stamps, public housing, rent subsidies, and school lunches);
- subtract taxes paid (Federal, State, and local income taxes, and Social Security payroll (FICA) taxes);
- add the value of the refundable Earned Income Tax Credit received;
- subtract child support paid;[51]
- for each working adult, subtract a flat amount per week worked (adjusted annually for inflation and not to exceed earnings) to account for work-related transportation and miscellaneous expenses;
- for families in which there is no nonworking parent, subtract actual child care costs per week worked, not to exceed the earnings of the parent with the lower earnings or a cap that is adjusted annually for inflation; and
- subtract medical out-of-pocket expenditures (including health insurance premiums).

In making its resource recommendations, the Panel strove to ensure consistency between resources and needs (as defined in the previous section to include the costs of food, clothing, shelter, utilities, and a small additional amount for other needed consumption). Thus, for example, the value of medical assistance is not included in the recommended resource measure because medical needs are not included in the recommended needs measure. The recommendation not to include the value of medical assistance is perhaps the most controversial of the Panel's proposals with regard to resources; the effect of this recommendation on the composition of poverty will have to be examined, because medical needs and benefits are by far the most important component excluded from the Panel's redefined measure. A question remains with respect to the economic resources of homeowners with low, or no, mortage payments. The Panel did not believe that data available at the time of its research were adequate to produce values for these economic resources.[52]

The current poverty measure counts child support payments as income to recipient families, but does not subtract such payments from the income of the payers. The Panel proposed that child support payments be treated consistently—added to recipients' income and subtracted from the payers' income. However, child support payments were not subtracted in the Panel's report or in this article, because the necessary information is not in the CPS data set. However, the Panel did examine the likely effect of such a subtraction on the poverty rate using panel data from the 1990 Survey of Income and Program Participation (SIPP). (See appendix B for a description of the SIPP.) The Panel's results suggested that the overall poverty rate would increase 0.3 to 0.5 percentage point if child support were subtracted from the payers' income.[53]

Because no one data source included information on all of the resource variables, imputed data had to be used. The basic data used by the Panel to define resources were from public use tapes developed from the March 1993 Supplement to the Current Population Survey; data refer to 1992. (See appendix B for a description of the Current Population Survey.) The values of in-kind benefits (food stamps, school lunches, and public and subsidized housing) and taxes (Federal and State income taxes and Social Security payroll taxes) were from an enhanced file prepared by the Census Bureau. The tax imputations include the refundable earned income tax credit , which was added to the resources for all eligible households.[54] The Census Bureau imputes the value of the in-kind benefits using an experimental market value approach.[55] The total value of food stamps, less the money spent to purchase the food stamps, is the value added to resources.

Out-of-pocket medical expenditures were imputed using tabulations provided by the Agency for Health Care Policy and Research based on data from the 1987 National Medical Expenditure Survey (NMES). (See appendix B for a description of NMES.) The data were aged to represent the 1992 population. The value of out-of-pocket medical care expenses was imputed separately for the elderly (head was 65 years of age or older) and the nonelderly (head was less than 65 years of age). The explanatory variables in the model for families headed by a nonelderly person included whether a family had health insurance or not, family size, race of head, and annual income. The explanatory variables included in the elderly model were age of head (under 75 years, 75 years and older), family size, and annual income. The Panel assumed that families that reported receiving medicaid would have no out-of-pocket medical expenditures. It randomly designated a fraction of the remaining families to have some out-of-pocket

medical expenditures. Matches were made using age and health insurance information from both the CPS and NMES.[56]

Child care expenses related to one's working and other work-related expenses were imputed using data from the SIPP and regression analysis. Child care expenses were based on data collected in a 1990 SIPP panel module, while other work-related expenses were based on data collected in a 1987 module. For the year 1992, the Panel (as did we) subtracted an imputed amount for annual child care expenses for families headed by a single parent and for families with a secondary worker in a two-earner family. The annual amount imputed could not exceed the earnings of the parent with the lower earnings or the value of the ceiling on eligible expenses for the dependent care tax credit of $2,400 for one child and $4,800 for two or more children.[57] Other work-related expenses were imputed for each worker aged 18 and older for each week worked. For 1992, an annual amount of $750 for a 52-week work year was deducted per earner; this is equivalent to $14.42 per week worked.

The Panel reported median gross money income for the two-adult, two-child family to be $43,387 in 1992 with imputed deductions of $5,894.[58]

Extending the research

In this section, we describe our replication of the multipliers produced by the Panel, and then define the experimental poverty thresholds and family resources that we used to evaluate the impact of implementing some of the Panel's recommendations. Minor differences between the Panel's published multipliers and the replicated multipliers are discussed, as are differences in the definitions of thresholds and resources used.

Replication of multipliers. Using the same definition of expenditures as did the Panel, we first attempt to replicate the multipliers that the Panel presented in table 2–6 of its report using expenditure survey data from 1989–91. Then, we assess the stability of the thresholds by examining the expenditures for the same basic bundle of commodities using data from 1992–94.

The reference family's mean expenditures for the basic bundle, composed of food, clothing, shelter,[59] and utilities, are presented by vingtile in table 2. The means presented by the Panel using the 1989–91 data and our means using data for the same period are quite close, but ours are more often slightly higher.[60] At the 30th percentile, the means are only $7 different, while at the 35th, they are about $80 different. The percentile means and the percentages of the median produced by the Panel and through our replication reveal almost identical results for 1992 using data from 1989–91. In several cases, the percentage for each vingtile is slightly higher using the 1992–94 data (means are presented in constant 1992 dollars); however, the differences are generally quite small when the more recent data are used.

Table 2. A comparison of the Panel's published expenditures, replicated expenditures, and expenditures using 1992–94 data

[Expenditures in constant 1992 dollars]

Percentile	Basic bundle 1 expenditures			Percent of median		
	Published, 1989–91	Replicated, 1989–91	1992–94	Published, 1989–91	Replicated. 1989–91	1992–94
5th	$7,041	$7,065	$7,071	45.9	46.2	46.1
10th	8,374	8,304	8,544	54.6	54.3	55.7
15th	9,275	9,297	9,594	60.4	60.8	62.5
20th	10,188	10,213	10,512	66.4	66.8	68.5
25th	11,100	11,118	11,325	72.3	72.7	73.8
30th	11,950	11,957	12,051	77.9	78.2	78.6
35th	12,719	12,796	12,798	82.9	83.7	83.4
40th	13,575	13,582	13,595	88.5	88.8	88.6
45th	14,389	14,417	14,471	93.8	94.3	94.3
50th	15,344	15,297	15,340	100.0	100.0	100.0
55th	16,282	16,292	16,230	106.1	106.5	105.8
60th	17,277	17,286	17,303	112.6	113.0	112.8
65th	18,369	18,394	18,458	119.7	120.3	120.3
70th	19,627	19,605	19,731	127.9	128.2	128.6
75th	20,989	20,911	21,250	136.8	136.7	138.5
80th	22,521	22,453	23,066	146.8	146.8	150.4
85th	24,594	24,613	25,375	160.3	160.9	165.4
90th	27,580	27,536	28,487	179.7	180.0	185.7
95th	34,094	34,345	35,456	222.2	224.5	231.1
100th	114,942	52,207	56,383	749.1	341.3	367.6

NOTE: Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Data are percentile values of expenditures by two-adult, two-child families on the Panel's basic bundle. The published values are from Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 2–6. (See appendix C for method used to calculate multipliers.)

Table 3. Multiplier of a smaller bundle (R1) compared with that of a larger bundle (R2)

Percentile	R1			R2		
	Published, 1989–91	Replicated, 1989–91	1992–94	Published, 1989–91	Replicated. 1989–91	1992–94
5th	1.18	1.20	1.18	1.20	1.21	1.27
10th	1.22	1.21	1.19	1.25	1.23	1.21
15th	1.21	1.21	1.20	1.23	1.24	1.22
20th	1.18	1.19	1.18	1.19	1.22	1.22
25th	1.18	1.18	1.18	1.20	1.20	1.21
30th	1.19	1.19	1.17	1.23	1.22	1.21
35th	1.20	1.18	1.17	1.26	1.21	1.20
40th	1.15	1.19	1.17	1.18	1.22	1.20
45th	1.16	1.17	1.16	1.20	1.20	1.19
50th	1.14	1.16	1.17	1.21	1.20	1.20
55th	1.17	1.16	1.15	1.17	1.20	1.20
60th	1.15	1.15	1.16	1.19	1.18	1.18
65th	1.13	1.15	1.16	1.18	1.18	1.20
70th	1.15	1.14	1.15	1.16	1.18	1.19
75th	1.15	1.16	1.14	1.20	1.19	1.18
80th	1.15	1.15	1.14	1.18	1.18	1.17
85th	1.13	1.14	1.14	1.16	1.17	1.18
90th	1.14	1.14	1.14	1.17	1.17	1.18
95th	1.12	1.13	1.13	1.16	1.16	1.17
100th	1.09	1.11	1.10	1.13	1.14	1.13

NOTE: Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

R1 = 1 + 1/2* Transportation share + Personal care share.

R2 = 1 + 1/2* Transportation share + Personal care share + Education share + Reading materials share.

The published values are from Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 2–6. (See appendix C for method used to calculate multipliers.)

Table 3 shows the multipliers produced by the Panel based on the 1989–91 data, our replication results, and the multipliers based on the 1992–94 data. In brief, the expenditures for the basic bundle are used in combination with expenditures for larger bundles to estimate the multipliers at each vingtile for each year. As noted earlier, one of the larger bundles allows for expenditures on transportation and personal care, while the other allows for these expenditures plus those for education and reading. For the replication and the 1992–94 comparison, transportation expenditures are defined to include the net purchase price of new and used vehicles, as are the expenditures produced for table 2–6 of the Panel report.

In table 3, the three columns identified as R1 refer to the multipliers based on the smaller of the larger bundles, while the R2 columns refer to the multipliers derived when the largest bundle is assumed. As with the means of the basic bundles, the Panel's and our replication multipliers appear to be quite similar. For the 30th and 35th percentiles, the multipliers are within 0.02 point of each other. (1.19 and 1.20 for the Panel and 1.19 and 1.18 in our replication). The multipliers using the 1992–94 data also differ little.

Differences between the Panel's published report and our replicated results for 1989–91 are due to corrections and improvements in the expenditure survey data base. For example, summary expenditure variables back to 1980, for which consistent definitions across time are used, have recently been added to that data base. Minor discrepancies between the Panel's results and our estimates may also exist because of the speed and volume of the data analysis that BLS originally completed for the Panel. Based on our comparison of the Panel's percentile means and percentage median results with our replication, we feel fairly confident that we are correctly following the procedure used by the Panel.

Defining the thresholds. In this section, we review results we obtained following two of the Panel's suggestions[61] that were not implemented in its report because of time considerations. These suggestions deal with the ways in which shelter costs for homeowners are incorporated in the thresholds and transportation expenditures are defined. We also examine the sensitivity of the Panel's assumptions with respect to the multipliers and to the "economies of scale" factor assumed for larger households. We take an incremental approach in producing our experimental thresholds.

First, we produce thresholds using the same multipliers (1.15 and 1.25) and the same percentages of median expenditures (0.78 and 0.83) that the Panel used, but we apply a different equivalence scale factor. This same averaging procedure is used to construct the other experimental thresholds described below. To simplify the analysis, we use an economies-of-scale factor of 0.7 to obtain the thresholds for family types other than the one consisting of two adults and two chil-

dren;[62] the Panel produced thresholds using scale factors of both 0.65 and 0.75.[63] Making this adjustment results in thresholds that we refer to as "Bundle 1 thresholds."

Second, we follow the Panel's recommendation to replace the shelter costs for homeowners with a rental equivalence value that accounts for the flow of services from owner-occupied housing. The same multipliers and scale factor are applied as for "Bundle 1 thresholds." We refer to this second set of thresholds as "Bundle 2 thresholds."

Third, we produce thresholds that are based on the estimated multipliers at the 30th and 35th mean percentiles (these correspond to 78 and 83 percent of the median), rather than the multipliers of 1.15 and 1.25 assumed by the Panel in the report. The range for the estimated multipliers is slightly narrower than the range proposed by the Panel, but the estimated multipliers are still within the suggested range. To estimate the multipliers used here, we took an outlays approach to transportation expenditures, rather than the Panel's original approach of including the total purchase price of a vehicle.[64] Thresholds allowing for expenditures for both the larger and smaller bundles are produced. This set of thresholds is referred to as "Multiplier A1 thresholds" and "Multiplier A2 thresholds." A1 refers to the smaller of the two larger bundles, and A2 to the larger of the two. Shelter costs are defined as for the Bundle 1 experimental thresholds.

Fourth, we build upon the last set of thresholds but define the shelter costs for homeowners to be their rental equivalence; outlays for transportation expenditures again are assumed (as for Multiplier A1 and A2 thresholds). The estimated multipliers based on this bundle of commodities are applied, still using the 78th and 83rd percentage of the median approach. The same scale factor (0.7) is used. We refer to this last set of thresholds as "Multiplier A4 thresholds" and "Multiplier A5 thresholds." Here, A4 refers to the smaller of the two bundles, and A5 refers to the larger of the two.

Each set of thresholds is constructed for 1990 through 1995, using expenditure data from the Interview portion of the 1987–94 Consumer Expenditure Survey. The 3-year moving average approach, with CPI-U adjustment to account for price changes over time, is followed. For each set of thresholds, the

Table 4. Official poverty thresholds for selected family types, and thresholds based on basic bundles 1 and 2, 1990–95

[In current dollars for each year]

Threshold	1990[2]	1991[2]	1992[2]	1993[2]	1994[2]	1995[2]
Official poverty threshold						
Singles	$6,652	$6,932	$7,143	$7,363	$7,547	$7,763
Married couple	8,509	8,865	9,137	9,414	9,661	9,933
Plus one child	10,520	10,963	11,293	11,631	11,929	12,267
Plus two children	13,254	13,812	14,228	14,654	15,029	15,455
Plus three children	15,598	16,254	16,743	17,245	17,686	18,187
Plus four children	17,464	18,199	18,747	19,308	19,802	20,364
Plus five children	19,561	20,384	20,998	21,626	22,180	22,809
Bundle 1 threshold[3]						
Singles	5,847	6,089	6,282	6,480	6,638	6,843
Married couple	9,498	9,892	10,205	10,527	10,783	11,117
Plus one child	11,719	12,204	12,591	12,988	13,304	13,715
Plus two children	13,771	14,341	14,796	15,262	15,634	16,117
Plus three children	15,699	16,349	16,868	17,399	17,823	18,374
Plus four children	17,531	18,256	18,836	19,429	19,902	20,517
Plus five children	19,283	20,082	20,719	21,371	21,892	22,569
Bundle 2 threshold[3]						
Singles	6,059	6,298	6,436	6,573	6,693	7,382
Married couple	10,191	10,592	10,823	11,055	11,256	11,993
Plus one child	12,763	13,266	13,556	13,845	14,097	14,796
Plus two children	15,172	15,770	16,114	16,458	16,758	17,387
Plus three children	17,459	18,147	18,543	18,939	19,284	19,822
Plus four children	19,650	20,425	20,870	21,316	21,704	22,134
Plus five children	21,762	22,620	23,114	23,607	24,037	24,347

[1] Thresholds derived from calculation: ((1.15*mean of amount that is 78 percent of the basic bundle expenditures median)+ (1.25 * mean of amount that is 83 percent of the basic bundle expenditures median))/2; equivalence scale =$(A+.7K)^{0.7}$

[2] For each year, the prior 3 years of expenditure survey data were updated to the current year, using the CPI-U , to produce the thresholds for the current year. For example, to produce the thresholds for 1992, 1989–91 expenditure survey data were updated to 1992 dollars using the change in the CPI from 1989, 1990, and 1991 to 1992, for each year, respectively.

[3] Bundle 1 and 2 thresholds based on basic Bundles 1 and 2 respectively.

Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges but not reductions in mortgage principals.

Basic Bundle 2 = Food + Clothing + Shelter + Utilities.

Here homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

basic bundle of expenditures for the reference two-adult, two-child family is calculated. The basic bundle definition changes only with respect to shelter. The alternative transportation expenditure definition affects the thresholds through the multipliers. As before, the basic bundle is used to rank families, and then to divide the families into vingtiles. The resulting means and estimated multipliers are used in conjunction with the scale factor to produce the thresholds.

In the present study, we assess the impact of the Panel's recommendations primarily by examining poverty rates resulting from the use of the different sets of thresholds. However, for illustrative purposes, we present Bundle 1 and Bundle 2 thresholds for singles and couples with and without children in table 4, to demonstrate the impact on the thresholds of introducing one of the Panel's recommendations. Over the 1990–95 period, the two-adult, two-child thresholds increase by 17.0 and 14.6 percent for Bundles 1 and 2, respectively, in line with the 16.6-percent increase in the official threshold. For each year and family group, the thresholds are higher when rental equivalence (reflected in Bundle 2) is used as the shelter expenditure for homeowners. However, increases in the official threshold, the Panel's thresholds, and our experimental thresholds are similar over the limited period covered. The thresholds presented in table 4 are not adjusted for geographic differences in housing costs; however, interarea adjustments in the price of housing are made for each set of experimental thresholds used to produce the poverty rates presented in table 5.

Defining resources. The resource measure used for this analysis is very similar to the one presented in

Table 5. Poverty rates of persons by selected characteristics, 1990–95

[In percent]

Characteristic and year	Thresholds[1]		
	Official	Bundle 1	Bundle 2
Age			
All ages:			
1990	13.5	18.3	21.7
1991	14.2	19.1	22.4
1992	14.8	19.9	23.1
1993	15.1	20.6	23.4
1994	14.6	19.2	21.7
1995	13.8	18.4	21.1
Children (under 18 years):			
1990	20.7	25.4	30.0
1991	21.8	26.6	30.8
1992	22.4	27.1	31.0
1993	22.7	27.9	31.4
1994	21.8	25.8	28.9
1995	20.8	24.3	27.7
Persons aged 18 to 64 years:			
1990	10.8	14.9	17.7
1991	11.4	15.6	18.4
1992	11.9	16.3	19.1
1993	12.4	17.1	19.4
1994	11.9	16.0	18.0
1995	11.4	15.4	17.7
Elderly (over 64 years):			
1990	12.2	20.2	24.3
1991	12.4	20.5	24.8
1992	12.9	22.5	26.4
1993	12.2	22.5	25.7
1994	11.7	21.0	24.0
1995	10.5	20.9	24.2
Race and ethnicity			
White:			
1990	10.7	15.7	18.9
1991	11.3	16.3	19.3
1992	11.9	17.1	20.1
1993	12.2	17.7	20.2
1994	11.7	16.7	19.0
1995	11.2	16.3	18.7
Black:			
1990	31.9	34.8	39.6
1991	32.7	35.9	41.1
1992	33.4	37.1	41.3
1993	33.1	37.4	42.0
1994	30.6	32.6	35.8
1995	29.3	30.8	35.3
Hispanic origin[2]:			
1990	28.1	40.3	46.4
1991	28.7	41.6	47.0
1992	29.6	41.5	47.8
1993	30.6	43.2	47.8
1994	30.7	41.7	45.9
1995	30.3	41.0	45.8
Work experience			
Worker in the family:			
1990	8.9	13.9	17.1
1991	9.3	14.5	17.5
1992	9.7	15.0	17.9
1993	9.9	15.6	18.2
1994	9.6	14.4	16.6
1995	9.5	13.9	16.5
Family type			
Married couple:			
1990	6.9	12.2	15.3
1991	7.3	12.9	15.7
1992	7.7	13.7	16.5

the Panel report. For each year of data, 1990–1995, we use the corresponding March CPS file as the base to define resources. The values of in-kind government subsidies and taxes paid, imputed by the Census Bureau and added to the March CPS microdata for each year, are employed in the calculation of resources. Work-related expenses (including child care expenses) and medical out-of-pocket expenses are imputed using the methods employed in the Panel's report, with adjustments for price changes.

A few measurement notes and caveats with respect to the resource definition and data should be mentioned at this point. In showing the effect of the recommended measure on poverty, the Panel report made imputations for work-related expenses, child care expenses, and out-of-pocket medical expenses; these have been highlighted earlier. We made these same imputations for 1992. To extend the estimates back to 1990 and forward to 1995, we use the same methods as those employed by the Panel for 1992, and adjust the dollar amounts for different years based on (1) the CPI-U for child and work expenses and (2) the medical CPI-U for medical expenditures. Medical expenditures over time also reflect changes in the cost of medicare part B coverage.[65] Other methods of updating amounts (or the use of updated models rather than updated dollar amounts) would have resulted in slightly different results. Much of the analysis shown in the next section is based on 1992 data because we feel most confident about the imputations in this, the base year for the estimates.

There are several reasons that the 1992 resource estimates are different from those used by the Panel. First, they reflect refinements made to the medical out-of-pocket expenditures by including part B medicare costs,[66] which were excluded from the Panel's imputation. Second, the Panel estimates are based on a public use file that caps values at the upper range of the income distribution in a procedure called topcoding; the use of topcoded income amounts can have a small effect on these estimates, primarily through the imputations employed in the measure. Third, there was a minor programming error in the files given to the Panel by the Census Bureau that resulted in the misclassification of some spouses. Fourth, there are some random elements in the imputations. And fifth, the March 1993 file used here was revised using 1990 census population controls; the estimates in the Panel report used the 1980 census controls. In this discussion, we do not present average resources for the population, but only the impact of using different thresholds and the results of testing our resource measure.

Table 5. Continued—Poverty rates by selected characteristics, 1990–95

[In percent]

Characteristic and year	Thresholds[1]		
	Official	Bundle 1	Bundle 2
1993	8.0	14.2	16.6
1994	7.4	13.1	15.2
1995	6.8	12.4	14.7
Female householder:			
1990	37.2	41.6	47.1
1991	39.7	43.6	48.7
1992	39.0	42.8	47.1
1993	38.7	43.5	48.0
1994	38.6	40.8	44.5
1995	35.5	38.8	42.9

[1] Official thresholds for each year are used. Budget 1 and Budget 2 thresholds derived from the calculation: ((1.15*mean of amount that is 78 percent of basic bundle expenditures median)+(1.25 * mean of amount that is 83 percent of basic bundle expenditures median))/2; equivalence scale $=(A+.7K)^{0.7}$.

Bundle 1 and 2 thresholds are based on basic Bundles 1 and 2, respectively.

Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges, but not reductions in mortgage principals.

Basic Bundle 2 = Food + Clothing + Shelter + Utilities.

Here, homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

[2] May be of any race.

The resource definition used to define poverty is enormously important, as even minor changes in the definition could have a large effect on the composition of the poverty population. For example, it would appear that an implicit assumption in the Panel's resource recommendation is that the "current money income" resource definition understates the poverty rate of working families (in that it fails to account for taxes and work-related expenses that reduce the disposable income of workers relative to that of nonworkers) and overstates the poverty rate of nonworkers (in that it fails to account for the noncash benefits that nonworkers are more likely to receive). While it is easy to speculate how an alternate resource definition might change our view of who is poor, the fact is that, given the extent of differences between the current and proposed measure, the only way to really understand the effects of the Panel's proposals is to simulate them and compare the results with estimates based on the official definition in a process described below.

Results based on the experimental measures

In this section, we try to answer two questions: (1) Would the Panel's proposed measure change our view of how poverty rates for different demographic groups have changed over

Table 6. Distribution of the poverty population by selected characteristics, 1992

	Number (thousands)			Percent of the poor		
	Thresholds[1]			Thresholds[1]		
	Official	Bundle 1	Bundle 2	Official	Bundle 1	Bundle 2
Total persons	256,549	256,549	256,549	—	—	—
Total poor persons	38,014	51,114	59,281	100.00	100.00	100.00
Children (under 18 years)	15,294	18,518	21,198	40.23	36.23	35.76
Persons aged 18–64 years	18,793	25,764	30,041	49.44	50.40	50.68
Elderly (over 64 years)	3,928	6,831	8,043	10.33	13.36	13.57
White	25,259	36,375	42,833	66.45	71.16	72.25
Black	10,827	12,030	13,397	28.48	23.54	22.60
Other	1,929	2,709	3,051	5.07	5.30	5.15
Non-Hispanic	30,422	40,471	47,027	80.03	79.18	79.33
Hispanic	7,592	10,643	12,254	19.97	20.82	20.67
No worker in household	17,067	18,666	20,432	44.90	36.52	34.47
Worker in household	20,947	32,448	38,850	55.10	63.48	65.54
Married	13,304	23,674	28,596	45.94	57.10	59.23
Female householder	14,205	15,597	17,172	49.05	37.62	35.57
Other	1,452	2,188	2,514	5.01	5.28	5.21

[1]Thresholds derived from calculation:

((1.15*mean of amount of 78 percent of basic bundle expenditures median)+

(1.25 * mean of amount that is 83 percent of basic bundle expenditures median))/2; equivalence scale $=(A+.7K)^{0.7}$.

Bundle 1 and 2 thresholds based on basic Bundles 1 and 2, respectively.

Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges, but not reductions in mortgage principals.

Basic Bundle 2 = Food + Clothing + Shelter + Utilities.

Here, homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

Table 7. Official poverty rates compared with rates based on experimental measures for selected demographic groups, 1992

	Poverty rate (in percent)					Percentage-point difference (standardized)[1]			
	Official	NAS1[2]	NAS2[2]	B1[3]	B2[3]	NAS1[2]	NAS2[2]	B1[3]	B2[3]
Total persons	14.8	18.1	19.0	19.9	23.1	3.3	4.2	5.1	8.3
Relatively high poverty rates									
Children	22.4	26.4	26.4	27.1	31.0	2.7	2.7	3.1	5.7
Hispanic	29.6	41.0	40.9	41.5	47.8	5.7	5.7	6.0	9.1
Black	33.4	35.6	36.8	37.1	41.3	1.0	1.5	1.6	3.5
Female householder	39.0	–	–	42.8	47.1	–	–	1.4	3.1
Relatively low poverty rates									
Married couples	7.7	–	–	13.7	16.5	–	–	11.6	17.1
Worker in family	9.7	13.7	14.1	15.0	17.9	6.2	6.8	8.1	12.7
White	11.9	15.3	16.1	17.1	20.1	4.3	5.3	6.5	10.3
Aged 18–64	11.9	–	–	16.3	19.1	–	–	5.5	8.9
Elderly	12.9	14.6	18.0	22.5	26.4	1.9	5.8	10.9	15.5

[1]Standardized percentage-point difference = (current total population poverty rate/current rate for group) *actual percentage-point change of the experimental poverty rate less the official poverty rate.

[2]NAS1 uses scale economy factor 0.75; NAS2 uses scale economy factor 0.65. The standardized changes are slightly different from those published, because the official poverty rates are slightly different. See Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 5–8, p. 265.

[3]B1 and B2 are the poverty rates based on basic Bundles 1 and 2 thresholds, respectively. (See the text for estimation methodology.)

Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges but not reductions in mortgage principal.

Basic Bundle 2 = Food + Clothing + Shelter + Utilities.

Here, homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

NOTE: Dash indicates data not available.

time? and (2) Would the proposed measure change our view of who is poor? In tables 5 and 6, the official poverty rates for different demographic groups for 1990 through 1995 are compared with the poverty rates that we produced following the Panel's proposed methods (threshold Bundles 1 and 2). Table 7 shows, for selected demographic groups, three sets of poverty rates for 1992: the official rates, the rates produced by the Panel (NAS1 and NAS2) , and the rates we produced using threshold Bundles 1 and 2 (B1 and B2). Also shown are standardized changes in the rates compared with the official rates. In table 6, we present the distribution of the poverty population for 1992 as defined by these groups. Table 8 shows the distribution of the poverty population when Multipliers A1, A2, A4, and A5 thresholds are assumed.

Poverty rates. At this very early stage of analysis of the likely effects of the Panel's recommendations, it is probably not wise to focus too much on the level of poverty rates, but rates are

Table 8. Alternative estimates and distributions of the poverty population by selected characteristics, 1992

Characteristic	Thresholds						
	Official	Bundle 1	Multiplier A1	Multiplier A2	Bundle 2	Multiplier A4	Multiplier A5
Reference family:							
Threshold	$14,228	$14,796	$14,773	$15,206	$16,114	$15,821	$16,159
Poverty rate of persons	14.8	19.9	19.9	21.0	23.1	22.4	23.2
	Persons in families (in thousands)						
Total	256,549	256,549	256,549	256,549	256,549	256,549	256,549
Total poor	38,014	51,114	50,943	53,822	59,281	57,484	59,530
Children (under 18 years)	15,294	18,518	18,448	19,403	21,198	20,612	21,273
Persons aged 18 to 64 years	18,793	25,764	25,683	27,148	30,041	29,088	30,183
Elderly (over 64 years)	3,928	6,831	6,811	7,271	8,043	7,784	8,074
White	25,259	36,375	36,253	38,518	42,833	41,386	43,049
Black	10,827	12,030	11,997	12,463	13,397	13,114	13,418
Other	1,929	2,709	2,693	2,841	3,051	2,983	3,063
Non-Hispanic	30,422	40,471	40,318	42,611	47,027	45,628	47,216
Hispanic	7,592	10,643	10,624	11,211	12,254	11,856	12,314
No worker in household	17,067	18,666	18,623	19,316	20,432	20,089	20,467
Worker in household	20,947	32,448	32,319	34,506	38,850	37,394	39,063
Married	13,368	23,674	23,561	25,353	28,596	27,572	28,751
Female householder	19,981	15,597	15,563	16,097	17,172	16,794	17,216
Other	4,666	2,188	2,188	2,325	2,514	2,422	2,528
	Percent distribution						
Total poor	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Children (under 18 years)	40.2	36.2	36.2	36.1	35.8	35.9	35.7
Persons aged 18 to 64 years	49.4	50.4	50.4	50.4	50.7	50.6	50.7
Elderly (over 64 years)	10.3	13.4	13.4	13.5	13.6	13.5	13.6
White	66.5	71.2	71.2	71.6	72.3	72.0	72.3
Black	28.5	23.5	23.5	23.2	22.6	22.8	22.5
Other	5.1	5.3	5.3	5.3	5.1	5.2	5.1
Non-Hispanic	80.0	79.2	79.1	79.2	79.3	79.4	79.3
Hispanic	20.0	20.8	20.9	20.8	20.7	20.6	20.7
No worker in household	44.9	36.5	36.6	35.9	34.5	34.9	34.4
Worker in household	55.1	63.5	63.4	64.1	65.5	65.1	65.6
Married	45.9	57.1	57.0	57.9	59.2	58.9	59.3
Female householder	49.1	37.6	37.7	36.8	35.6	35.9	35.5
Other	5.0	5.3	5.3	5.3	5.2	5.2	5.2

NOTE: Official poverty thresholds for 1992 used.

Bundle 1 and Bundle 2 thresholds derived using methods outlined in text.

Basic Bundle 1 = Food + Clothing + Shelter + Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges, but not reductions in mortgage principals.

Basic Bundle 2 = Food + Clothing + Shelter + Utilities.

Here homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

Multiplier A1 thresholds derived using multipliers of 1.21 and 1.19; Multiplier A2 thresholds derived from multipliers of 1.24 and 1.23.

Multiplier A4 thresholds derived using multipliers of 1.19 and 1.17; Multiplier A5 thresholds derived from multipliers of 1.21 and 1.20.

Exhibit 1. Elements of the current and proposed poverty measures [1]

Element	Current measure	Proposed measure
Threshold concept	Food times a large multiplier for all other expenses	Food, clothing, shelter, utilities, plus a small amount for other expenses
1992 level (two-adult, two-child family)	$14,228	Suggested range of $13,700–$15,900
Updating method	Update 1963 level each year for price changes	Update each year by change in spending on food, clothing, and shelter over previous 3 years by two-adult, two-child families
Threshold adjustments:		
By family type	Separately developed thresholds by family type; lower thresholds for elderly singles and couples	Reference family threshold adjusted by use of equivalence scale, which assumes children need less than adults and economies of scale for larger families
By geographic area	No adjustments	Adjusting for housing cost by region and size of metropolitan area
Family resource definition (to compare with threshold to determine poverty status)	Gross (before-tax) money income from all sources	Gross money income, plus value of near-money in-kind benefits (such as food stamps), minus income and payroll taxes and other nondiscretionary expenses (such as child care and other work-related expenses; child support payments to another household; out-of-pocket medical care expenses, including health insurance premiums)
Data source (for estimating income)	March Current Population Survey	Survey of Income and Program Participation
Period of measurement	Annual	Annual, supplemented by shorter term and longer term measures
Economic unit of analysis	Families and unrelated individuals	Families (including cohabiting couples) and unrelated individuals

[1]Reproduced from Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 1.1, p. 41.

important as a starting point from which to examine the composition of, and trends in, the poverty population. Bundle 1 (B1) thresholds for 1992 (the base year for the Panel's estimates) yield a poverty rate for the total population of 19.9 percent, 5.1 percentage points above the official poverty rate of 14.8 percent. (See table 7.) The B1 poverty rates are similar to, although slightly higher than,[67] those produced by the Panel (NAS1 and NAS2), while B2 poverty rates are higher.

Over the 1990–95 period, rates under the official and proposed methodologies behave similarly, with increases over the 1990–93 period and declines over the 1993–95 period. (See table 5.) The official rate rose from 13.5 to 15.1 percent between 1990 and 1993 and fell to 13.8 percent by 1995. The experimental rates rose from 18.3 to 20.6 percent from 1990 to 1993 and fell to 18.4 percent by 1995. Under each scenario (Bundle 1 and 2 thresholds), the 1995 rate is similar to the 1990 rate. Rates based on Bundle 2 thresholds are higher for each year than are the rates based on Bundle 1 thresholds. These results suggest that poverty rates change with the business cycle.[68] However, over the 1993–94 period, poverty rates dropped for blacks and for persons living in families with a female householder, regardless of the bundle used in the analysis. This drop is due to the addition of the earned income tax credit in the resource measure.

Obviously, there are many factors that account for differences between the official and modified poverty rates, such as the concentration of income around the poverty threshold, the level of noncash transfer program participation, tax burdens, and medical expenditures. So it is not surprising that the levels of difference between the official and experimental poverty rates are not uniform across demographic groups. In order to explore these differences, we follow the Panel's method of examining the differences in poverty rates in terms of standardized percentage-point changes. The changes are standardized so that results for each group are comparable with those for the total population. The standardized changes are summarized in table 7.

Generally, the differences in poverty rates are small for groups with very high official poverty rates and larger for groups with lower poverty rates. Let us examine this relation-

Summary of the recommendations of the Panel on Poverty and Family Assistance[1]

Recommendation 1.1. The official U.S. measure of poverty should be revised to reflect more nearly the circumstances of the Nation's families and changes in them over time. The revised measure should comprise a set of poverty thresholds and a definition of family resources—for comparison with the thresholds to determine who is in or out of poverty—that are consistent with each other and otherwise statistically defensible. The concepts underlying both the thresholds and definition of family resources should be broadly acceptable and understandable and operationally feasible.

Recommendation 1.2. On the basis of the criteria in Recommendation 1.1, the poverty measure should have the following characteristics:

- The poverty thresholds should represent a budget for food, clothing, shelter (including utilities), and a small additional amount to allow for other needs (such as household supplies, personal care, and nonwork-related transportation).
- A threshold for a reference family type should be developed using actual Consumer Expenditure Survey data and updated annually to reflect changes in expenditures for food, clothing, and shelter over the previous 3 years.
- The reference family threshold should be adjusted to reflect the needs of different family types and to reflect geographic differences in housing costs.
- Family resources should be defined—consistent with the threshold concept—as the sum of money income from all sources, together with the value of near-money benefits (such as food stamps) that are available to buy goods and services in the budget, minus expenses that cannot be used to buy these goods and services. Such expenses include income and payroll taxes, child care and other work-related expenses, child support payments to another household, and out-of-pocket medical care costs, including health insurance premiums.

Recommendation 2.1. A poverty threshold with which to initiate a new series of official U.S. poverty statistics should be derived from Consumer Expenditure Survey data for a reference family of four persons (two adults and two children). The procedure should be to specify a percentage of median annual expenditures for such families on the sum of three basic goods and services—food, clothing, and shelter (including utilities)—and apply a specified multiplier to the corresponding dollar level so as to add a small amount for other needs.

Recommendation 2.2. The new poverty threshold should be updated each year to reflect changes in consumption of the basic goods and services contained in the poverty budget: determine the dollar value that represents the designated percentage of the median level of expenditures on the sum of food, clothing, and shelter for two-adult, two-child families, and apply the designated multiplier. To smooth out year-to-year fluctuations and to lag the adjustment to some extent, perform the calculations for each year by averaging the most recent 3 years' worth of data from the Consumer Expenditure Survey, with the data for each of those years brought forward to the current period by using the change in the Consumer Price Index.

Recommendation 2.3. When the new poverty threshold concept is first implemented and for several years thereafter, the Census Bureau should produce a second set of poverty rates for evaluation purposes by using the new thresholds updated only for price changes (rather than for changes in consumption of the basic goods and services in the poverty budget).

Recommendation 2.4. As part of implementing a new official U.S. poverty measure, the current threshold level for the reference family of two adults and two children ($14,228 in 1992 dollars) should be reevaluated, and a new threshold level established with which to initiate a new series of poverty statistics. That reevaluation should take account of both the new threshold concept and the real growth in consumption that has occurred since the official threshold was first set 30 years ago.

Recommendation 3.1. The four-person (two-adult, two-child) poverty threshold should be adjusted for other family types by means of an equivalence scale that reflects differences in consumption by adults and children under 18 and economies of scale for larger families. A scale that meets these criteria is the following: children under 18 are treated as consuming 70 percent as much as adults on average; economies of scale are computed by taking the number of adult equivalents in a family (that is, the number of adults plus 0.70 times the number of children) and then raising this number to a power of from 0.65 to 0.75.

Recommendation 3.2. The poverty thresholds should be adjusted for differences in the cost of housing across geographic areas of the country. Available data from the decennial census permit the development of a reasonable cost-of-housing index for nine regions and, within each region, for several population size categories of metropolitan areas. The index should be applied to the housing portion of the poverty thresholds.

Recommendation 3.3. Appropriate agencies should conduct research to determine methods that could be used to update the geographic housing cost component of the poverty thresholds between the decennial censuses.

Recommendation 3.4. Appropriate agencies should conduct research to improve the estimation of geographic cost-of-living differences in housing, as well as other components of the poverty budget. Agencies should consider improvements to data series, such as the BLS area price indexes, that have the potential to support improved estimates of cost-of-living differences.

Recommendation 4.1. In developing poverty statistics, any significant change in the definition of family resources should be accompanied by a consistent adjustment of the poverty thresholds.

Recommendation 4.2. The definition of family resources for comparison with the appropriate poverty threshold should be disposable money and near-money income. Specifically, resources should be calculated as follows:

- estimate gross money income from all public and private sources for a family or unrelated individual (which is income as defined in the current measure);
- add the value of near-money nonmedical in-kind benefits, such as food stamps, subsidized housing, school lunches, and home energy assistance;
- deduct out-of-pocket medical care expenditures, including health insurance premiums;
- deduct income taxes and Social Security payroll taxes;
- for families in which there is no nonworking parent, deduct actual child care costs per week worked, not to exceed the earnings of the parent with the lower earnings or a cap that is adjusted annually for inflation;
- for each working adult, deduct a flat amount per week worked (adjusted annually for inflation and not to exceed earnings) to account for work-related transportation and miscellaneous expenses; and
- deduct child support payments from the income of the payer.

Recommendation 4.3. Appropriate agencies should work to develop one or more "medical care-risk" indexes that measure the economic risk to families and individuals of having no, or inadequate, health insurance coverage. However, such indexes should be kept separate from the measure of economic poverty.

Recommendation 5.1. The Survey of Income and Program Participation (SIPP) should become the basis of official U.S. income and poverty statistics in place of the March income supplement to the Current Population Survey. Decisions about the SIPP design and questionnaire should take account of the data requirements for producing reliable time series of poverty statistics using the proposed definition of family resources (money and near-money income minus certain expenditures). Priority should be accorded to methodological research for SIPP that is relevant for improved poverty measurement. A particularly important problem to address is population undercoverage, particularly of low-income minority groups.

Recommendation 5.2. To facilitate the transition to SIPP, the Census Bureau should produce concurrent time series of poverty rates from both SIPP and the March CPS by using the proposed revised threshold concept and updating procedure and the proposed definition of family resources as disposable income. The current series should be developed starting with 1984, when SIPP was first introduced.

Recommendation 5.3. The Census Bureau should routinely issue public use files from both SIPP and the March CPS that include the Bureau's best estimate of disposable income and its components (taxes, in-kind benefits, child care expenses, and so forth), so that researchers can obtain poverty rates consistent with the new threshold concept from either survey.

Recommendation 5.4. Appropriate agencies should conduct research on methods to develop poverty estimates from household surveys with limited income information that are comparable to the estimates that would be obtained from a fully implemented disposable income definition of family resources.

Recommendation 5.5. Appropriate agencies should conduct research on methods to construct small-area poverty estimates from the limited information in the decennial census that are comparable with the estimates that would be obtained under a fully implemented disposable income concept. In addition, serious consideration should be given to adding one or two questions to the decennial census to assist in the development of comparable estimates.

Recommendation 5.6. The Bureau of Labor Statistics should undertake a comprehensive review of the Consumer Expenditure Survey to assess the costs and benefits of changes to the survey design, questionnaire, sample size, and other features that could improve the quality and usefulness of the data. The review should consider ways to improve the survey for the purpose of developing poverty thresholds, for permitting the measurement of poverty on the basis of a consumption or expenditure concept of family resources at some future date, and for other analytic

purposes related to the measurement of consumption, income, and savings.

Recommendation 6.1. The official poverty measure should continue to be derived on an annual basis. Appropriate agencies should develop poverty measures for periods that are shorter and longer than a year, with data from SIPP and the Panel Study of Income Dynamics, for such purposes as program evaluation. Such measures may require the inclusion of asset values in the family resources definition.

Recommendation 6.2. The official measure of poverty should continue to use families and unrelated individuals as the units of analysis for which thresholds are defined and resources aggregated. The definition of "family" should be broadened for purposes of poverty measurement to include cohabiting couples.

Recommendation 6.3. Appropriate agencies should conduct research on the extent of resource sharing among roommates and other household and family members to determine if the definition of the unit of analysis for the poverty measure should be modified in the future.

Recommendation 6.4. In addition to the basic poverty counts and ratios for the total population and groups—the number and proportion of poor people—the official poverty series should provide statistics on the average income and distribution of income for the poor. The count and other statistics should also be published for poverty measures in which family resources are defined net of government taxes and transfers, such as a measure that defines income in before-tax terms, a measure that excludes means-tested government benefits from income, and a measure that excludes all government benefits from income. Such measures can help assess the effects of government taxes and transfers on poverty.

Recommendation 7.1. Agencies responsible for Federal assistance programs that use the poverty guidelines derived from the official poverty thresholds (or a multiple there of) to determine eligibility for benefits and services should consider the use of the Panel's proposed measure. In their assessment, agencies should determine whether it is necessary to modify the measure—for example, through a simpler definition of family resources or by linking eligibility less closely to the poverty thresholds because of possible budgetary constraints—to better serve program objectives.

Recommendation 8.1. The States should consider linking their need standard for the Aid to Families with Dependent Children program to the Panel's proposed poverty measure, and whether it may be necessary to modify this measure to better serve program objectives.

[1]Adapted from Citro and Michael, *Measuring Poverty*, pp. 4–15.

ship by comparing the poverty rates using Bundle 1 thresholds for 1992 with the official thresholds. In standardized terms, the black poverty rate is only 1.6 points higher; for persons in families maintained by women, the change is 1.4 percentage points. One exception to this rule is for persons of Hispanic origin. Their official poverty rate is relatively high (29.6 percent), as is their revised poverty rate (41.5 percent); and their standardized change is 6 percentage points.

For groups with a lower official incidence of poverty, the percentage increase in the rates based on the experimental thresholds is relatively large. The standardized change in poverty rates for persons aged 18 to 64 yields a rate that is 5.5 percentage points higher than the official rate. The rate for those over 64 years of age is 10.9 percentage points higher, and the white poverty rate is 6.5 percentage points above the official poverty rate. The percentage-point change in the poverty rate for families with at least one worker is 8.1, and that for married couples is 11.6.

The changes are in the same direction when threshold Bundle 2 poverty rates and the official poverty rate are compared. However the changes in percentage points are larger because threshold Bundle 2 is larger than threshold Bundle 1.

Composition of the poverty population. The effect of the differences in levels between the official and revised poverty rates is evident in table 6. Here, the composition of the poverty population under the official and experimental poverty measures is examined, based on results for 1992. As one might expect, there are differences in the composition of the poverty population when the proposed measures are applied. For example, under the official poverty definition, the following groups of persons make up a greater percentage of the poor than when Bundle 1 thresholds are assumed (this same general result applies when Bundle 2 thresholds are assumed): children (40.2 versus 36.2 percent), blacks (28.5 versus 23.5 percent), non-Hispanics (80 versus 79.2 percent), persons living in families with no workers (44.9 versus 36.5 percent), and those living in households headed by women (49.1 versus 37.6 percent). In contrast, all other groups noted in table 6 make up a greater percentage of the poor when the experimental measures are used. We observe increases for the elderly (based on rates of 10.3 and 13.4 percent) and for persons living in married-couple families (based on rates of 45.9 and 57.1 percent). Also note-

worthy is the increase in the percentage of the poor living in families in which there is at least one worker present, which rises from 55.1 to 63.5 percent of the poor.

Does the new poverty measure change our view of who is poor? The answer is that it yields a poverty population that looks more like the total population. Due to the subtraction of work-related expenses, we see relatively more persons in families with a worker, more persons aged 18 to 64 years, and more persons in married-couple families among the poor. We also see relatively fewer persons in families that receive cash or near-cash government transfers. Persons in families with children, in families with no workers, and in female-householder families are relatively less likely to be classified as poor. It is clear that, as we have interpreted the Panel's proposal, the composition of the poverty population changes quite a bit.

Other thresholds. Table 8 shows the results of changing the multipliers from 1.15 and 1.25 to the *computed* multipliers, in order to account for additional "other" expenditures. The estimates, relating to 1992, are presented in terms of population characteristics; as in earlier sections of the analysis, 78 and 83 percent of median expenditures are the basis for deriving the thresholds. As a point of reference, the dollar values for each of the thresholds for the reference family in 1992 also are presented in the table.

The thresholds that we use in the two preceding sections (Bundle 1 and Bundle 2 thresholds, with multipliers of 1.15 and 1.25), the number of persons living in families with resources below the thresholds, and the percentage distributions for selected demographic groups are very similar to the rates based on Multiplier thresholds A1 and A4. (See the top panel of table 8 for the number of persons under the thresholds, and the bottom panel for the percentage distributions.)

The addition of expenditures for education and reading (reflected in Multiplier thresholds A2 and A5) shifts the overall poverty rates up only slightly (bottom panel of table 8), from 19.9 to 21.1 and 22.4 to 23.2 for Multipliers A1 versus A2 thresholds and Multiplier A4 versus A5 thresholds. Bundle 2 thresholds (with a rental equivalence approach to shelter costs for homeowners) and Multipliers A4 and A5 thresholds result in higher overall poverty rates than those based on Bundle 1 thresholds and Multipliers A1 and A2 thresholds.

In examining the percentage distribution of the poverty population for 1992 by selected characteristics, we find that the percentages of the poor for most of the groups are similar when Bundle 1 and 2 thresholds, and the respective Multiplier thresholds, are assumed. However, differences do result. For example, if we compare the percentages based on Bundle 1 and 2 thresholds, we find a decrease for blacks (23.5 versus 22.6 percent), for persons living in families with no workers (from 36.5 to 34.5 percent), and for persons living in female-headed households (37.6 versus 35.6 percent). The same definitional change results in increases in the percentage distributions for persons living in families with at least one worker (63.5 versus 65.5) and for persons living in married-couple families (57.1 versus 59.2 percent).

These differences across subgroups are similar to those presented in the Panel's report and closely match expectations, given the construction of the resource measure. One small but notable difference between the two sets of estimates is that poverty rates for the elderly under our experimental measures are higher than those reported; this is due to the inclusion of medicare part B premiums in the medical out-of-pocket amounts deducted from income.

OUR FINDINGS REVEAL that poverty thresholds constructed according to the recommendations of the National Academy of Sciences Panel on Poverty and Family Assistance seem to be stable over time and across various definitions of the minimum expenditure bundle. Similarly, poverty rates based on these thresholds appear to behave in a reasonable manner, both over time and across variously defined budgets, and in fact, not all that differently from those derived using the official definition of poverty currently in use. Generally, the poverty rates follow trends over time similar to the official poverty measure and are always higher, both over time and across thresholds and subgroups, than rates based on the official measure. Differences across subgroups are stable over time, and we see a poverty population that looks more like the total population in terms of demographic and socioeconomic characteristics. These results are in line with expectations posited in the Panel's report—that is, the poor are more likely to be white, to be married, and to have a member of the family in the work force. □

FOOTNOTES

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[1] Gordon Fisher refers to such developments as changes in social processes. He notes that with technological advances and increases in levels of living, new consumption items are introduced. With the introduction of new items and more widespread acceptance and use of these items, the belief about what are necessities changes. Changes in the way our society is organized also can contribute to changes in our expectations (for example, greater dependence on private rather than public transportation), as can changes in social policy (such as changes in the minimum quality acceptable for public housing). See Gordon Fisher, "Relative or Absolute—A New Light on the Behavior of Poverty Lines Over Time," *Newsletter of the Government Statistics Section and the Social Statistics Section of the American Statistical Association*, Summer 1996, pp. 10–12.

[2] Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995).

[3] These deductions would include income and payroll taxes, child care and other work-related expenses, child support to another household, and out-of-pocket medical care costs. See Citro and Michael, *Measuring Poverty*, pp. 4–5.

[4] Estimation of the thresholds work is being conducted primarily by the Bureau of Labor Statistics and estimation of resources by the Census Bureau.

[5] For more information concerning these measures, see Citro and Michael, *Measuring Poverty*; Aldi J.M. Hagenaars, *Perception of Poverty* (Amsterdam, North Holland, 1986); and Patricia Ruggles, *Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy* (Washington, The Urban Institute Press, 1990). Examples of studies focusing on relative and subjective measures include Thesia I. Garner and Klaas de Vos, "Income sufficiency v. poverty: Results from the United States and the Netherlands," *Journal of Population Economics*, vol. 8, 1995, pp. 117–34; R. Morisette and Susan Poulin, *Income Satisfaction Supplement. Summary of Four Survey Years*, Labour and Household Surveys Analysis Division Staff Report (Ottawa, Canada, Statistics Canada, 1991); and Karel Van den Bosch, Tim Callan, J. Estivill, P. Hausman, B. Jeandidier, R. Muffels, and J. Yfantopoulos, "A Comparison of Poverty in Seven European Countries and Regions, Using Subjective and Relative Measures," *Journal of Population Economics*, vol. 6, issue 3, pp. 235–59.

[6] *Poverty in the United States: 1991*, Current Population Reports, Consumer Income Series, P-60, no. 181(Bureau of the Census, 1992).

[7] See A.J.M. Hagenaars, Klaas de Vos, and M.A. Zaidi, *Poverty Statistics in the Late 1980s: Research Based on Micro-Data* (Luxembourg, Eurostat, 1997); "Income Distribution and Poverty in EU12–1993," in ***S**tatistics in Focus—Population and Social Conditions, 1997–6* (Luxembourg, Eurostat, 1997); Commission of the European Communities, *Final Report from the Commission to the Council on the First Programme of Pilot Schemes and Studies to Combat Poverty* (Brussels, 1981); and Peter Townsend, *Poverty in the United Kingdom* (Harmondsworth, Penguin Books, 1979).

[8] Karel Van den Bosch, personal communication, June 1996 and December 1996.

[9] Gordon M. Fisher, "The Development and History of the Poverty Thresholds," *Social Security Bulletin*, Winter 1992.

[10] See Fisher, "The Development and History"; and Citro and Michael, *Measuring Poverty*, p. 109.

[11] Connie Citro, discussant of an earlier version of this article when it was presented as a paper during the 1996 Society of Government Economists Conference Session on Inequality and Poverty, Nov. 22, 1996.

[12] Fisher, "The Development and History," p.10.

[13] Also see: *Estimates of Poverty Including the Value of Noncash Benefits: 1984*, Technical Paper 55 (Bureau of the Census, 1985); *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1986*, Current Population Reports, Series P-60, No. 164-RD-1 (Bureau of the Census, 1988); *Poverty in the United States 1995* (Bureau of the Census, 1996); Citro and Michael, *Measuring Poverty*; and Ruggles, *Drawing the Line*.

[14] Gordon Fisher, "Poverty Guidelines for 1992," *Social Security Bulletin*, spring 1992.

[15] Ruggles, *Drawing the Line*.

[16] See *The War on Poverty, Hearings Before the Joint Economic Committee, Congress of the United States, 102nd Congress, First Session*, July 25, Sep. 25, and Nov. 19, 1991, S. HRG. 102–631 (Washington, U.S. Government Printing Office, 1992).

[17] See Citro and Michael, *Measuring Poverty*.

[18] One measure that Statistics Canada uses to determine the low income status of families, similar to family poverty, is the set of "low-income cutoffs" (LICO's). The LICO's are based on a hybrid approach, in the sense that a specific set of commodities is assumed as necessary, but the proportion and implicit allowance for other spending are determined in a relative manner. See Citro and Michael, *Measuring Poverty*, pp. 127–28.

[19] The entire report can be found on the Census Bureau Web site: hhtp://www.census.gov/hhes/www/povmeas.html

[20] Citro and Michael, *Measuring Poverty*, p. xvii.

[21] Since the Panel's report was published, other studies have examined these issues. See, for example, U.S. General Accounting Office: (a) Controlled correspondence, GAO/GGD-96-183R (Washington, 1996); and (b) *Poverty Measurement: Issues in Revising and Updating the Official Definition*, GAO/HEHS-97-38, April 1997. (2) Brookings Institution and Institute for Research on Poverty: (a) "Summary of Meeting on Alternative Poverty Measure Strategy" (The Brookings Institution, Apr. 8, 1997); (b) Gary Burtless, Tom Corbett, and Wendell Primus, "Improving the Measurement of American Poverty," unpublished paper, Apr. 8, 1997; and (c) Wendell Primus, "Implementing a New Measure of Poverty: State of Current Research and Analytical Work," unpublished paper, Feb. 13, 1997.

Since the publication of the Panel's report, working groups also have met to share information about current work related to poverty measurement. See Memorandum from Katherine Wallman (Office of Management and Budget), "Initial Meeting of Steering Group to Improve the Measurement of Income and Poverty," Mar. 26, 1997; and Burtless, Corbett, and Primus, "Improving the Measurement."

[22] Citro and Michael, *Measuring Poverty*, pp. 4–5.

[23] The basic bundle is composed of food, apparel, shelter, and utilities, which are defined as follows:

Food includes food purchased for home use and away, and excludes alcohol and tobacco and other nonfood items purchased at grocery stores.

Clothing includes expenditures for all types of clothing, including uniforms and sewing materials.

Shelter includes rent, and, for homeowners, mortgage interest (shelter does not include principal payment), taxes, maintenance, and repairs.

Utilities include fuels (such as natural gas and electricity), telephone, and public services (such as water and sewer).

[24] For the Panel's report, the reference family was specifically defined as including a married couple with two of their own children.

[25] Citro and Michael, *Measuring Poverty*, p. 101.

[26] *Ibid*., pp. 194–99.

[27] *Ibid*., p.148

[28] *Ibid*.

[29] The Panel members describe their approach in this way because they considered it to be conceptually more understandable than simply applying the year-to-year change in median expenditures for food, clothing, shelter, and utilities to a starting-year threshold. Both approaches are the same algebraically and produce the same results. (See Citro, discussant, 1996 Society of Government Economists Conference Session on Inequality and Poverty.)

[30] For example, if percentiles were used to define the thresholds, a situation could result in which a recession reduced median expenditures somewhat, but more dramatically lowered the expenditure level at the 30th per-

centile. It would not be desirable for the poverty threshold or standard of need to reflect this greater reduction. (See Citro, discussant, 1996 Society of Government Economists Conference Session on Inequality and Poverty.)

[31] Citro and Michael, *Measuring Poverty*, table 2-7, p. 156.

[32] A consumer unit comprises either (1) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements; (2) a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent; or (3) two or more persons living together who use their incomes to make joint expenditure decisions. Financial independence is determined by the three major expense categories: housing, food, and other living expenses. To be considered financially independent, at least 2 of the 3 major expense categories have to be provided entirely or in part by the respondent.

[33] A vingtile is 1/20 of some total. For example, the fourth vingtile of an income distribution is the same as the first quintile or the second decile.

[34] *Transportation* expenditures were defined by the Panel to include vehicle finance charges, expenses for gasoline and motor oil, maintenance and repairs, vehicle insurance, public transportation (including airfares), and vehicle rentals, licenses, and other charges. In addition, transportation included the total purchase price (minus the trade-in value) of new and used vehicles.

Personal care includes products for hair, oral hygiene, and shaving; cosmetics and bath products; electric personal care appliances; other personal care products; and personal care services.

[35] *Education* includes tuition, fees, textbooks, supplies, and equipment for public and private nursery schools, elementary schools, high schools, colleges, universities, and other schools.

Reading materials includes subscriptions for newspapers, magazines, and books through book clubs, purchase of single copy newspapers, and magazines, newsletters, books, encyclopedias, and other reference books.

[36] Citro and Michael, *Measuring Poverty*, p. 151.

[37] In constructing the cost of raising a child, the Department of Agriculture used data from a 1990 study by the Department of Transportation, which found that employment-related transportation activities account for about 40 percent of travel costs for families with children. See Center for Nutrition Policy and Promotion, *Expenditures on Children by Families, 1995 Annual Report* (U.S. Department of Agriculture, 1996), p. 5; and Federal Highway Administration, *1990 Nationwide Personal Transportation Study* (U.S. Department of Transportation, 1994).

[38] Citro, discussant, 1996 Society of Government Economists Conference Session on Inequality and Poverty.

[39] For example see: Trudi J. Renwick, "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), pp. 573–82; *Urban Family Budgets and Comparative Indexes for Selected Urban Areas*, USDL 82–139 (Bureau of Labor Statistics, 1982); and John E. Schwarz and Thomas J. Volgy, *Forgotten Americans* (New York, W. W. Norton and Company, 1992).

[40] As did the Panel, we adjusted the thresholds for estimated differences in the cost of housing by size of metropolitan area within nine regions of the country; the cost-of-housing index values are relative to 1.00 for the United States as a whole; see Appendix A. (The thresholds shown in table 4 are not adjusted for geographic differences.)

[41] For a description of the housing adjustment, see Citro and Michael, *Measuring Poverty*, pp. 194–99, 249, 252–53.

[42] See citations in Citro and Michael, *Measuring Poverty*, p. 177.

[43] The Rothbarth method uses expenditures on adult goods as an indicator of the standard of living. For example, a married couple with a child must cut their budget in certain areas because the child brings needs but no resources. Certain adult expenditures, such as those for alcohol, tobacco, and adult clothing, should decline when a child is added to the family. If the reduction in income that caused the same decline in expenditures can be calculated, then the amount of income diverted to the child, and hence its cost, has been computed. The decline in expenditures in adult goods shows the amount of money that parents have diverted to the child, which is the information needed. It does not show a decline in living standards associated with the addition of a child.

[44] Citro and Michael, *Measuring Poverty*, p. 176. See also David M. Betson, "'Is Everything Relative?' The Role of Equivalence Scales in Poverty Measurement," unpublished paper, March 1996. Available from the author at the Department of Economics, University of Notre Dame, South Bend, IN.

[45] For example, a second person adds 0.29 to the scale, a third adds 0.24, a fourth adds 0.43, and a fifth person adds 0.31. In some cases, single-parent families have higher thresholds than married-couple families of the same size, which implies that children cost more than adults for some families. (See Citro and Michael, *Measuring Poverty*, p. 165).

[46] Citro and Michael, *Measuring Poverty*, p. 180. The proposed scale with a scale economy factor of 0.65 results in thresholds that are close to the official thresholds. The scales implicit in the official poverty thresholds for one-adult units and for one-adult, two-child families are greater than the scales based on the 0.65 scale economy factor; others are lower for the one-adult family types. The implicit scales are greater than the 0.65 economy factor-based scales for two adults with no children and for two adults with two children; others are lower for the two-adult family types.

[47] Citro and Michael, *Measuring Poverty*, p. 210; also see GAO congressional correspondence for a discussion of a consumption-based poverty measure, GAO/GGD-96-183R (General Accounting Office, 1996).

[48] See Citro and Michael, *Measuring Poverty*, pp. 210–14, and p. 279.

[49] Citro and Michael, *Measuring Poverty*, p. 214. The sample size for the Consumer Expenditure Survey is to increase by 50 percent beginning in fiscal year 1999.

[50] Based on briefing materials prepared for Citro and Michael, *Measuring Poverty* and the Panel's primary report (p.10).

[51] Child support paid was not subtracted in the Panel's study or in this study.

[52] Citro and Michael, *Measuring Poverty*, p. 71.

[53] *Op. cit.*, pp. 244, 267.

[54] About 85 percent of eligible households receive the earned income tax credit. (See John Karl Scholz, "Tax Policy and the Working Poor: The Earned Income Tax Credit," *Focus*, Winter 1993–94, pp. 1–12).

[55] For the most recent estimates of the government subsidies and taxes paid and their potential impact on poverty rates, see *Poverty in the United States: 1995*.

[56] Citro and Michael, *Measuring Poverty*, pp. 254–55.

[57] *Ibid*., p. 255.

[58] *Ibid., 257*

[59] For homeowners, shelter expenditures include those for mortgage interest, taxes, maintenance, and repairs; shelter does not include payments for reduction of the mortgage principal.

[60] The value presented by the Panel for the 100th vingtile is more than double our mean. To obtain our mean for this vingtile, we average the expenditures over the 97.5th and 100th percentile range; the Panel's value is the top value in the data file for the reference family, not the mean for any range.

[61] Based on the Panel's report or the 1993 Maritato memorandum.

[62] Scale = $(A+.7K)^{0.7}$.

[63] The average of the two scale factors 0.65 and 0.75 is used for convenience.

[64] As noted earlier, the Panel followed this approach for ease in processing and because of the quick turnaround required to produce the estimates.

[65] Panel member David Betson is conducting research to revise the estimates for medical out-of-pocket expenditures. His study will be released by the National Academy of Sciences in the near future.

[66] David M. Betson, "Poor Old Folks: Have Our Methods of Poverty Measurement Blinded Us to Who Is Poor?" unpublished paper (South Bend, IN, University of Notre Dame, October 1995).

[67] The B1 poverty rate for the elderly is much higher than the NAS1 and NAS2 poverty rates because the Part B medicare costs are included in the resource definition used in this research, but are not included in the National Academy of Sciences resource definition.

[68] The stability may be due to the way in which the resource measure is constructed. Some of the elements are updates based on price indexes. If these elements had been updated based on actual data, a more erratic trend in the poverty rates might be observed.

[69] To standardize the changes in poverty rates, the ratio of the current poverty rate for the total population to the rate for the group is applied to the actual percentage-point change for that group. This procedure standardizes the percentage-point changes by treating each group as if it had the same poverty rate as all people. The Panel used this method because "it is awkward to speak of percentage changes in a percentage." See Citro and Michael, *Measuring Poverty*, p. 262.

Appendix A: Regional cost-of-housing index values

TableA-1. Cost-of-housing index values (relative to 1.00 for the United States as a whole) by region (census division) and size of metropolitan area[1]

Region and population size	Index value
New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	1.128
Metropolitan areas:	
250,000–500,000 inhabitants	1.128
500,000–1,000,000 inhabitants	1.148
1,000,000–2,500,000 inhabitants	1.141
2,500,000 inhabitants or more	1.209
Middle Atlantic (New Jersey, New York, Pennsylvania)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.908
Metropolitan areas:	
250,000–500,000 inhabitants	.997
500,000–1,000,000 inhabitants	1.020
1,000,000–2,500,000 inhabitants	.975
2,500,000 inhabitants or more	1.187
East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.896
Metropolitan areas:	
250,000–500,000 inhabitants	.959
500,000–1,000,000 inhabitants	.987
1,000,000–2,500,000 inhabitants	.995
2,500,000 inhabitants or more	1.059
West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.861
Metropolitan areas:	
250,000–500,000 inhabitants	.962
500,000–1,000,000 inhabitants	.981
1,000,000–2,500,000 inhabitants	1.028
2,500,000 inhabitants or more	—
South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.899
Metropolitan areas:	
250,000–500,000 inhabitants	.961
500,000–1,000,000 inhabitants	1.007
1,000,000–2,500,000 inhabitants	1.043
2,500,000 inhabitants or more	1.119
East South Central (Alabama, Kentucky, Mississippi, Tennessee)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.827
Metropolitan areas:	
250,000–500,000 inhabitants	.935
500,000–1,000,000 inhabitants	.947
1,000,000–2,500,000 inhabitants	—
2,500,000 inhabitants or more	—
West South Central (Arkansas, Louisiana, Oklahoma, Texas)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.858
Metropolitan areas:	
250,000–500,000 inhabitants	.911
500,000–1,000,000 inhabitants	.942
1,000,000–2,500,000 inhabitants	.962
2,500,000 inhabitants or more	1.005
Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.888
Metropolitan areas:	
250,000–500,000 inhabitants	.976
500,000–1,000,000 inhabitants	1.039
1,000,000–2,500,000 inhabitants	1.003
2,500,000 inhabitants or more	—
Pacific (Alaska, California, Hawaii, Oregon, Washington)	
Nonmetropolitan areas and metropolitan areas under 250,000 inhabitants	.969
Metropolitan areas:	
250,000–500,000 inhabitants	1.018
500,000–1,000,000 inhabitants	1.028
1,000,000–2,500,000 inhabitants	1.104
2,500,000 inhabitants or more	1.217

NOTE: Housing cost indexes are calculated from 1990 census data on gross rent for two-bedroom apartments with specified characteristics; index values are drawn from the 45th percentile of the gross rent distributions, as described in the text of the article.

Dash indicates data not available or no such areas in the region.

[1] Table reproduced from Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 5–3, pp. 252–53.

Appendix B: Description of data sources

Consumer Expenditure Survey

The Consumer Expenditure Survey (CE) has two components—an Interview Survey and a Diary Survey. Interview survey data are used for this study. About 5,000 consumer units participate in the Interview Survey each quarter. Consumer units are interviewed five times, at 3-month intervals for 1 year. Data from the first interview are used to "bound" expenditures for subsequent interviews and are not used in estimation. The sample is a rotating panel in which 20 percent of the sample are interviewed for the first time each quarter while 20 percent are interviewed for the last time. The Interview Survey covers about 95 percent of total expenditures.

As part of the evaluation of CE data, BLS compares its estimates of aggregate consumer expenditures and income with independent sources of data. Comparisons are made with the Personal Consumption Expenditures component of the National Income and Product Accounts, the National Health Accounts, the Current Population Survey, and other data resources. When differences in definitions and populations are accounted for, the CE data compare reasonably well with both the levels and changes over time of the other data sources. (See *Consumer Expenditure Survey, 1992–93*, Bulletin 2462 (Bureau of Labor Statistics, September 1995).)

Current Population Survey

The Current Population Survey (CPS) is conducted by the Bureau of the Census for the Bureau of Labor Statistics. Each year, the March Supplement or Annual Demographic Supplement is used to collect income data. At various other times during the survey cycle, supplementary questions are asked concerning various topics. The population covered includes the civilian noninstitutional population of the United States and members of the Armed Forces in the United States living off post or with their families on post, but excludes all other members of the Armed Forces. The sample is about 60,000 households, including families and unrelated individuals; data are reported for more than 150,000 persons. Coverage does not include residents of U.S. territories or other areas outside the 50 States and the District of Columbia. During the 1993–95 period, three changes were introduced in the CPS: (1) for the 1993 survey, 1990 census population controls were introduced; (2) for the 1994 survey, the procedure for interviewing was converted from paper and pencil to Computer Assisted Personal Interviewing (CAPI); and (3) for the 1995 survey, a new sample based on the 1990 census design was introduced.

Survey of Income and Program Participation

The Survey of Income and Program Participation (SIPP) is a continuing panel survey, begun in 1983, that is sponsored and conducted by the Bureau of the Census. The design in effect until 1994 introduced a new sample panel each February. In 1994 and 1995, there were no panels introduced. In 1996, a nonoverlapping design was implemented. Each sample of households is interviewed every 4 months. Panels undergo eight interviews. The sample covers the U.S. civilian noninstitutionalized population and members of the Armed Forces living off post or with their families on post. Sample size has varied from 12,500 to 23,500 households per panel; the 1996 panel is composed of 36,700 households. The reporting unit is the household, with unrelated individuals and families also identified.

National Medical Expenditure Survey

The 1987 National Medical Expenditure Survey is a nationally representative survey of the civilian noninstitutionalized population in the United States. The survey was designed to provide estimates of insurance coverage and the use of services, expenditures, and sources of payment. The household component involved four rounds of personal and telephone interviews at 4-month intervals, with a short telephone interview constituting a supplementary fifth round. Ninety-four percent of those completing the first interview, or about 37,000 persons in approximately 15,000 households, participated in all four rounds of interviewing.

Appendix C: Computing the multipliers

The expenditures for two basic bundles of commodities are computed, and the multipliers are then applied to produce thresholds. *Basic bundle 1* is defined in the same way as the Panel's basic bundle, with expenditures defined as in standard Consumer Expenditure Survey tabulations and publications. For *basic bundle 2,* the definition of shelter expenditures changes to reflect a *rental equivalence value for homeowners' shelter costs*. To obtain the multipliers used with both basic bundles 1 and 2, an *outlays approach is used to define transportation expenditures*. Here, the total purchase prices of vehicles are not included in the computation, but the expenditures paid out of pocket each year are.

The shares of each basic bundle, in combination with larger bundles, are used to estimate the multipliers at each vingtile value for each year. One of the larger bundles allows for expenditures on transportation and personal care, while the other larger bundle allows for these expenditures plus those for education and reading. The estimated multipliers, using basic bundle 1 and the larger budgets, are referred to as A1 (based on the smaller of the two larger bundles) and A2 (based on the larger of the two larger bundles) below and in the main text and tables. The estimated multipliers based on basic bundle 2 expenditures and the two corresponding larger budgets are referred to as A4 and A5. The methodology is described below.

Multipliers based on basic bundle 1

To produce the multipliers, the expenditures for the basic bundle, expanded bundles (B1–B3), and ratios of the basic bundle to the expanded bundles are computed *for each consumer unit.* Consumer units are then ranked into 20 equal groups, or vingtiles, based on their expenditures for basic bundle 1. Then the mean shares for B1 through B3 are computed for each vingtile using the microdata. These mean shares are used to estimate the multiplier by vingtile at the aggregate level.

Basic bundle1 = food + clothing + shelter + utilities
B1 = Basic bundle 1 + transportation (outlays)
B2 = B1 + personal care
B3 = B2 + education + reading
Mean shares:
ShareB1 = Basic bundle1/B1
ShareB2 = Basic bundle1/B2
ShareB3 = Basic bundle1/B3

Multiplier A1 is computed as:

Half of transportation (outlays) share = 0.5*((1/ShareB1) – 1)
Personal care share = (1/ShareB2) – (1/ShareB1)

A1 = 1 + half of transportation (outlays) share + personal care share
or
A1 = 1 + (0.5*((1/ShareB1) – 1)) + ((1/ShareB2) – (1/ShareB1)).

Multiplier A2 is computed as:

Half of transportation (outlays) share = 0.5*((1/ShareB1) – 1)
Personal care, education, and reading share = (1/ShareB3) – (1/ShareB1)

A2 = 1 + half of transportation (outlays) share + (personal care + education + reading) share
or
A2 = 1 + (0.5*((1/ShareB1) – 1)) + ((1/ShareB3) – (1/ShareB1)).

Note that the multipliers will differ if they are estimated at the micro level rather than at the macro, or aggregate, level. We, as did the Panel, computed the shares at the micro level and then computed average of these shares. The remaining calculations are at the aggregate level for each vingtile. We are using the mean values of the ShareB1–B3 variables when we calculate the shares A1 and A2.

Multipliers based on basic bundle 2

The same methodology to obtain the multipliers applies when basic bundle 2 is used. Here, rental equivalence replaces shelter expenditures for homeowners, and transportation expenditures are defined as outlays.

The basic bundle, expanded bundles (B4–B6), and ratios of the basic bundle to the expanded bundles are computed *for each consumer unit.* The mean shares for B4 through B6 are computed for each vingtile. The mean shares are then used to estimate the multiplier by vingtile, as above.

Basic bundle 2 = food + clothing + rent for renters + rental equivalence for homeowners + utilities
B4 = Basic bundle 2 + transportation (outlays)
B5 = B4 + personal care
B6 = B5 + education + reading
Mean shares:
ShareB4 = Basic bundle 2/B4
ShareB5 = Basic bundle 2/B5
ShareB6 = Basic bundle 2/B6

Multiplier A4 is computed as:

Half of transportation (outlays) share = 0.5*((1/ShareB4) – 1)
Personal care share = 0.5*(1/ShareB5) – (1/ShareB4)

A4 = 1 + half of transportation (outlays) share + personal care share
or
A4= 1 + (0.5*((1/ShareB4) – 1)) + ((1/ShareB5) – (1/ShareB4)).

Multiplier A5 is computed as:

Half of transportation (outlays) share = 0.5*((1/ShareB4) – 1)
Personal care share = (1/ShareB6) – (1/ShareB4)

A5 = 1 + half of transportation (outlays) share + (personal care + education + reading) share
or
A5 = 1 + (0.5*((1/ShareB4) – 1)) + ((1/ShareB6) – (1/ShareB4)).

Table 5. Poverty rates by selected characteristics, 1990–95

[In percent]

Characteristic and year	Thresholds[1] Bundle 1	Official	Bundle 2
Age			
All ages:			
1990	13.5	18.3	21.7
1991	14.2	19.1	22.4
1992	14.8	19.9	23.1
1993	15.1	20.6	23.4
1994	14.6	19.2	21.7
1995	13.8	18.4	21.1
Children (under 18 years):			
1990	20.7	25.4	30.0
1991	21.8	26.6	30.8
1992	22.4	27.1	31.0
1993	22.7	27.9	31.4
1994	21.8	25.8	28.9
1995	20.8	24.3	27.7
Persons aged 18 to 64 years:			
1990	10.8	14.9	17.7
1991	11.4	15.6	18.4
1992	11.9	16.3	19.1
1993	12.4	17.1	19.4
1994	11.9	16.0	18.0
1995	11.4	15.4	17.7
Elderly (over 64 years):			
1990	12.2	20.2	24.3
1991	12.4	20.5	24.8
1992	12.9	22.5	26.4
1993	12.2	22.5	25.7
1994	11.7	21.0	24.0
1995	10.5	20.9	24.2
Race and ethnicity			
White:			
1990	10.7	15.7	18.9
1991	11.3	16.3	19.3
1992	11.9	17.1	20.1
1993	12.2	17.7	20.2
1994	11.7	16.7	19.0
1995	11.2	16.3	18.7
Black:			
1990	31.9	34.8	39.6
1991	32.7	35.9	41.1
1992	33.4	37.1	41.3
1993	33.1	37.4	42.0
1994	30.6	32.6	35.8
1995	29.3	30.8	35.3
Hispanic origin[2]:			
1990	28.1	40.3	46.4
1991	28.7	41.6	47.0
1992	29.6	41.5	47.8
1993	30.6	43.2	47.8
1994	30.7	41.7	45.9
1995	30.3	41.0	45.8
Work experience			
Worker in the family:			
1990	8.9	13.9	17.1
1991	9.3	14.5	17.5
1992	9.7	15.0	17.9
1993	9.9	15.6	18.2
1994	9.6	14.4	16.6
1995	9.5	13.9	16.5
Family type			
Married couple:			
1990	6.9	12.2	15.3
1991	7.3	12.9	15.7
1992	7.7	13.7	16.5

Table 5. Poverty rates by selected characteristics, 1990–95

[In percent]

Characteristic and year	Thresholds[1] Bundle 1	Official	Bundle 2
1993	8.0	14.2	16.6
1994	7.4	13.1	15.2
1995	6.8	12.4	14.7
Female householder:			
1990	37.2	41.6	47.1
1991	39.7	43.6	48.7
1992	39.0	42.8	47.1
1993	38.7	43.5	48.0
1994	38.6	40.8	44.5
1995	35.5	38.8	42.9

[1] Official thresholds for each year are used. Budget 1 and Budget 2 thresholds derived from the calculation:

((1.15*mean of amount that is 78 percent of basic bundle expenditures median)+(1.25 * mean of amount that is 83 percent of basic bundle expenditures median))/2; equivalence scale $=(A+.7K)^{0.7}$.

Bundle 1 and 2 thresholds are based on basic Bundles 1 and 2, respectively.

Basic Bundle 1=Food+Clothing+Shelter+Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges, but not reductions in mortgage principals.

Basic Bundle 2=Food+Clothing+Shelter+Utilities.

Here, homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.

[2] May be of any race.

Table 1. Current and alternative equivalence scales for families of selected types, expressed relative to a value of1.00 for a family of two adults and two children

Family type	Implicit in current official thresholds[1]	0.65 scale economy factor	0.70 scale economy factor	0.75 scale economy factor
One adult[2]	0.513	0.451	0.425	0.399
Plus one child	.680	.637	.616	.595
Plus two children	.794	.797	.784	.770
Plus three children	1.003	.942	.937	.933
Plus four children	1.159	1.075	1.081	1.087
Plus five children	1.293	1.200	1.217	1.234
Married couple	.660	.708	.690	.672
Plus one child	.794	.861	.851	.841
Plus two children	1.000	1.000	1.000	1.000
Plus three children	1.177	1.129	1.140	1.151
Plus four children	1.318	1.251	1.273	1.295
Plus five children	1.476	1.367	1.400	1.434

[1] The thresholds for single adults or unrelated individuals and for two-adult families are those for units with the householders under age 65.

[2] For the one-adult unit, includes people living alone and with others in a household not related to them.

SOURCE: Connie F. Citro and Robert T. Michael, eds., Measuring Poverty: A New Approach (Washington, National Academy Press, 1995), Table 3-4, p. 181;and the authors' own calculations. The Panel proposed that the scale be set in the range of 0.65 to 0.75. A 0.70 scale economy factor is used in this article.

Table 4. Official poverty thresholds for selected family types, and thresholds based on basic bundles 1 and 2, 1990–95

[In current dollars for each year]

Threshold	1990	1991	1992	1993	1994	1995
Official poverty threshold						
Singles	$6,652	$6,932	$7,143	$7,363	$7,547	$7,929
Married couple	8,509	8,865	9,137	9,414	9,661	10,205
Plus one child	10,520	10,963	11,293	11,631	11,929	12,267
Plus two children	13,254	13,812	14,228	14,654	15,029	15,455
Plus three children	15,598	16,254	16,743	17,245	17,686	18,187
Plus four children	17,464	18,199	18,747	19,308	19,802	20,364
Plus five children	19,561	20,384	20,998	21,626	22,180	22,809
Bundle 1 threshold						
Singles	5,847	6,089	6,282	6,480	6,638	6,843
Married couple	9,498	9,892	10,205	10,527	10,783	11,117
Plus one child	11,719	12,204	12,591	12,988	13,304	13,715
Plus two children	13,771	14,341	14,796	15,262	15,634	16,117
Plus three children	15,699	16,349	16,868	17,399	17,823	18,374
Plus four children	17,531	18,256	18,836	19,429	19,902	20,517
Plus five children	19,283	20,082	20,719	21,371	21,892	22,569
Bundle 2 threshold[3]						
Singles	6,059	6,298	6,436	6,573	6,693	7,382
Married couple	10,191	10,592	10,823	11,055	11,256	11,993
Plus one child	12,763	13,266	13,556	13,845	14,097	14,796
Plus two children	15,172	15,770	16,114	16,458	16,758	17,387
Plus three children	17,459	18,147	18,543	18,939	19,284	19,822
Plus four children	19,650	20,425	20,870	21,316	21,704	22,134
Plus five children	21,762	22,620	23,114	23,607	24,037	24,347

[1] Thresholds derived from calculation ((1.15*mean of amount that is 78 percent of the basic bundle expenditures median)+ (1.25 * mean of amount that is 83 percent of the basic bundle expenditures median))/2; equivalence scale =(A+.7K)0.7

[2] For each year, the prior 3 years of expenditure survey data were updated to the current year, using the CPI-U , to produce the thresholds for the current year. For example, to produce the thresholds for 1992, 1989–91 expenditure survey data were updated to 1992 dollars using the change in the CPI from 1989, 1990, and 1991 to 1992, for each year respectively.

[3] Bundle 1 and 2 thresholds based on basic bundles 1 and 2 respectively. Basic bundle 1=Food+Clothing+Shelter+Utilities. Homeowners' shelter expenditures include mortgage interest and related charges but not reductions in mortgage principals.

Basic bundle 2=Food+Clothing+Shelter+Utilities. Here homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for what amount could the house be rented.

Table 6. Distribution of the poverty population by selected characteristics, 1992

	Number (thousands)			Percent of the poor		
	Thresholds[1]			Thresholds[1]		
	Official	Bundle 1	Bundle 2	Official	Bundle 1	Bundle 2
Total	256,549	256,549	256,549			
Total poor	38,014	51,114	59,281	00.00	100.00	100.00
Children (under 18 years)	15,294	18,518	21,198	40.23	36.23	35.76
Persons aged 18–64 years	18,793	25,764	30,041	49.44	50.40	50.68
Elderly (over 64 years)	3,928	6,831	8,043	10.33	13.36	13.57
White	25,259	36,375	42,833	66.45	71.16	72.25
Black	10,827	12,030	13,397	28.48	23.54	22.60
Other	1,929	2,709	3,051	5.07	5.30	5.15
Non-Hispanic	30,422	40,471	47,027	80.03	79.18	79.33
Hispanic	7,592	10,643	12,254	19.97	20.82	20.67
No worker in household	17,067	18,666	20,432	44.90	36.52	34.47
Worker in household	20,947	32,448	38,850	55.10	63.48	65.54
Married	13,304	23,674	28,596	45.94	57.10	59.23
Female householder	14,205	15,597	17,172	49.05	37.62	35.57
Other	1,452	2,188	2,514	5.01	5.28	5.21

1*Thresholds derived from calculation

((1.15*mean of amount of 78 percent of basic bundle expenditures median)+

(1.25 * mean of amount that is 83 percent of basic bundle expenditures median))/2; equivalence scale $=(A+.7K)^{0.7}$.

Bundle 1 and 2 thresholds based on basic Bundles 1 and 2 respectively.

Basic Bundle 1=Food+Clothing+Shelter+Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges, but not reductions in mortgage principals.

Basic Bundle 2=Food+Clothing+Shelter+Utilities.

Here homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for what amount the housecould be rented.

Table 7. Official poverty rates compared to rates based on experimental measures for selected demographic groups, 1992

	Poverty rate (in percent)					Percentage-point difference (standardized)[1]			
	Official	NAS1[2]	NAS2[2]	B1[3]	B2[3]	NAS1[2]	NAS2[2]	B1[3]	B2[3]
Total	14.8	18.1	19.0	19.9	23.1	3.3	4.2	5.1	8.3
Relatively high poverty rates									
Children	22.4	26.4	26.4	27.1	31.0	2.7	2.7	3.1	5.7
Hispanic	29.6	41.0	40.9	41.5	47.8	5.7	5.7	6.0	9.1
Black	33.4	35.6	36.8	37.1	41.3	1.0	1.5	1.6	3.5
Female householder	39.0	–	–	42.8	47.1	–	–	1.4	3.1
Relatively low poverty rates									
Married couples	7.7	–	–	13.7	16.5	–	–	11.6	17.1
Worker in family	9.7	13.7	14.1	15.0	17.9	6.2	6.8	8.1	12.7
White	11.9	15.3	16.1	17.1	20.1	4.3	5.3	6.5	10.3
Age 18–64	11.9	–	–	16.3	19.1	–	–	5.5	8.9
Elderly	12.9	14.6	18.0	22.5	26.4	1.9	5.8	10.9	15.5

[1] Standardized percentage-point difference = (current total population poverty rate/current rate for group) *actual percentage-point change of the experimental poverty rate less the official poverty rate.

[2] NAS1 uses scale economy factor 0.75; NAS2 uses scale economy factor 0.65. The standardized changes are slightly different from those published because the official poverty rates are slightly different. See Connie F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (Washington, National Academy Press, 1995), table 5–8, p. 265.

[3] B1 and B2 are the poverty rates based on basic Bundles 1 and 2 thresholds respectively. (See the text for estimation methodology.)

Basic Bundle 1=Food+Clothing+Shelter+Utilities.

Homeowners' shelter expenditures include mortgage interest and related charges but not reductions in mortgage principal.

Basic Bundle 2=Food+Clothing+Shelter+Utilities.

Here, homeowners' shelter expenditures are defined as the rental equivalence value reported when the respondent is asked for the amount for which the house could be rented.