Experimental Poverty Measurement for the 1990's

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I. Introduction

Social and economic conditions have changed in the U.S. in fundamental ways in the last thirty years—there are more working mothers, families are smaller, there are wider variations in commodity types (e.g., health care coverage), and expectations about what it takes to meet one's needs are higher. In addition, geographic variations in housing and the increasing importance of government programs have contributed to families' appraisals of the value of their disposable incomes. Fisher[1] refers to such changes 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 can also contribute to changes in our expectations (e.g., greater dependence on private rather than public transportation), as can changes in social policy (e.g., changes in the minimum quality acceptable for public housing). With these and related changes have come questions concerning whether the measures and data which are used to produce various economic statistics are still meaningful. Among the measures questioned is the one for poverty.

The most recent comprehensive examination of poverty measurement in the United States was conducted by the National Research Council (NRC) of the National Academy of Sciences (NAS) Panel on Poverty and Family Assistance. This Panel of eminent scholars published their findings in a report titled *Measuring Poverty: A New Approach*[2]. Included in the report are recommendations for a new poverty measurement, along with examples of how to implement the recommendations. The Panel recommended that poverty measurement, including both thresholds and resources, should better reflect social and economic changes. The thresholds

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[1] 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, D. C.: National Academy Press, 1995

should be based on expenditures for food, clothing, shelter, utilities, and "a little bit more." The underlying assumption concerning these thresholds is that a family's basic needs can be met. Resources should be defined to reflect the sum of money income (net of taxes) and near money benefits from selected government transfer programs, less some work related and medical expenses, that the family has available to meet their needs. A summary of the Panel's general recommendations are presented in Appendix A. In Appendix Table B, the elements of the current poverty measure and the proposed measure are compared and contrasted.

The purpose of this paper is to report on operationalizing the Panel's basic proposed procedure in a test environment. We identify our poverty measure as "experimental," in contrast to the current poverty measure and the one published by the Panel. In this study, we do not attempt to justify the Panel's recommended procedure nor do we attempt to evaluate its advantages and disadvantages; instead we take the recommendations as they are presented. This work represents a joint project between the Bureau of the Census (Census) and the Bureau of Labor Statistics (BLS), the two U.S. government statistical agencies which are most likely to be involved in producing the new poverty measure if the recommendations are followed. Estimation of the thresholds work is being conducted primarily by the BLS team and estimation of resources by the Census team.

For the thresholds, we first implement the same basic recommendations that the Panel assumed to be sure we are following the same procedure. However we go beyond this and make changes in the definition of the poverty thresholds as suggested by the Panel. We produce experimental sets of thresholds based on these changes. For our experimental work, we first develop a set of thresholds using an expenditures outlays approach to reflect transportation expenditures, accounted for in the "a little bit more." The Panel did not state explicitly in the report that such an approach be followed but did suggest in a memorandum[3] that this represents a more reasonable depiction of transportation costs.[4] Second we develop another set of thresholds, building upon the

[3] Nancy Maritato, "Analysis of Consumer Expenditure Survey tabulations and technical documentation," Memorandum to the Members of the Panel on Poverty and Family Assistance, National Academy of Sciences, Washington, D. C. September 3, 1993.
[4] Another approach may incorporate the amortization of the cost of a vehicle over its expected life.

first set, but using rental equivalence to assign a flow of services to homeowners to approximate their shelter costs. The Panel suggested that the flow of services for owner occupied housing be reflected in the shelter costs.[5] They stated that "Such a definition would treat homeowners with low or no mortgage payments in a comparable manner with other homeowners and renters." [6] In addition, we use different multipliers to test the sensitivity of the thresholds. As recommended by the Panel, the thresholds are based on data from the Consumer Expenditure (CE) Survey.[7]

The resource definition used in this study is similar to the one employed by the Panel. However, in this study, we also include part B Medicare costs in the medical out-of-pocket expenditures; these expenditures were not included in the Panel's original measure of resources. Another difference is that the income data are from a file that does not employ income topcoding; the file used by the Panel was income topcoded. For illustrative purposes, the Panel used data from the Current Population Survey (CPS) [8] as the basic source to define resources; however, they recommended that the better source of resource data would be the Survey of Income and Program Participation (SIPP). [9] Using the CPS meant having to supplement the data with imputations based on information from the SIPP and the National Medical Expenditure Survey (NMES).[10]

Poverty thresholds and rates for the total population and selected demographic groups are presented for 1990 through 1995 using the two sets of thresholds. Our findings reveal that the thresholds are stable over time. Poverty rates based on a midpoint of the Panel's recommended threshold range follow the trend exhibited by the official measure, although the rates based on the experimental measures are always higher. For example, person poverty rates for 1992 of between 20 and 24 percent result when using various experimental thresholds and our

[5] Other approaches to define the flow of services from housing could be used, such as imputing rent for owner occupants using hedonic regression.
[6] Citro and Michael, 1995, page 148.
[7] See Appendix C for a description of the CE Survey.
[8] See Appendix C for a description of the CPS Survey
[9] See Appendix C for a description of the SIPP.
[10] See Appendix C for a description of the NMES.

resource measure; these compare to an official poverty rate of 14.8 percent for the same year. We also find that, using the new poverty measure yields a poverty population that looks more like the total population in terms of demographic and socioeconomic characteristics, that is, the poor are more likely to be white, married, and working

We find that the initial recommendations of the NAS Panel can be implemented, but with some difficulty. Current data do not allow for full implementation of even some of the most basic recommendations, for example, subtracting necessary expenses related to work and child care. The Panel modeled these expenses as do we, thus placing tremendous faith in our modeling abilities.

This paper is a summary of a research project, not a report on a production program; thus, the results presented are to be *considered experimental and for research purposes only*. Our aim is to test the feasibility of implementing the procedure proposed by the Panel in the current BLS and Census environments. The remainder of this paper is divided into five sections. In section two we provide brief background information concerning poverty measurement and cite recent activities to evaluate the U.S. measure. In section three, we review the procedure followed by the Panel in producing its experimental thresholds and defining resources. In section four, we present and discuss the procedure that we used. In the fifth section, we present our results, then summarize and conclude in section six.

II. Background

In order to produce poverty statistics, a poverty concept must be selected and resources defined. Over the decades, the most often used concepts for poverty measurement are identified as absolute, relative, and

subjective.[11] 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 (more on this below).[12] A relative poverty concept is based on the relative position of households or individuals within a distribution (e.g., of income or expenditures) as a crucial determination of poverty status. Such a measure explicitly sets the poverty threshold based on judgment. In Europe, relative concepts of poverty are most often used.[13] Subjective measures are based upon the notion that the opinions of people about their own situation (e.g., with respect to the income level minimally necessary to make ends meet) should ultimately be the decisive factor in defining poverty. In Belgium, subjectively based poverty thresholds are generally accepted as instruments to measure differences and changes in adequacy, although they are not used to measure poverty officially.[14]

A. History of U.S. Poverty Measurement

As noted above, the current U.S. poverty threshold is considered an absolute threshold, based on the cost of a minimum food diet along with a multiplier for other expenses. The original thresholds were developed in the early 1960s using the work of Mollie Orshansky. She used the food buying patterns of lower income households were used as the basis for the thresholds, thus the preferences of consumers in the U.S. at that time were

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[11] For more information concerning these measures see: Citro and Michael 1995; 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, D. C.: 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, pp. 117-134, 1995; R. Morissett 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 Van den Bosch, Karel, 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, pp. 235-259.

[12] *Poverty in the United States: 1991*. Current Population Reports, Consumer Income Series, P-60, no. 181. Washington DC: U.S. Department of Commerce.

[13] See the 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; Peter Townsend, ***Poverty in the United Kingdom***, Harmondsworth: Penguin Books, 1979.

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

considered. Also, the multiplier used to account for spending on other commodities, in addition to the minimum food bundle, was based on the share of total after-tax money income spent on food by the average family of three or more persons in the U.S. The costs of the food budgets were multiplied by three to estimate the minimum total living costs for families of three or more persons. (The Panel notes that the thresholds for other size families were derived in a slightly different way.[15]) The thresholds are based on data collected using the 1955 U. S. Department of Agriculture Household Food Consumption Survey. The Panel suggests that one of the reasons the Orshansky based thresholds were adopted is because of their relationship to other measures at the time: the original 1963 threshold for a two-adult/two-child family is very close to one-half the median after-tax four-person family income and to a subjective four-person family threshold derived from Gallup Poll data; thus the U.S. poverty measure had components of absolute, relative, and subjective poverty measures.[16]

Each year since 1963, when the U.S. 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 nine persons or more rather than seven or more.[17]

The definition of poverty currently used in the U.S. is based on the price-updated thresholds in comparison to gross (pre-tax) annual money income. A family is identified as poor if its family's income is below its annual poverty threshold. The official definition of resources has not changed over time, however researchers

[15] Citro and Michael 1995, p. 109.
[16] Citro, Connie, comments on paper presented during the 1996 Society of Government Economists Conference session on Inequality and Poverty, November 22, 1996.
[17] Fisher, Gordon, "The Development and History of the Poverty Thresholds," ***Social Security Bulletin***, vol. 55, no. 4, Winter 1992, p.10.

at the Census Bureau have been experimenting with alternative measures of resources for several years.[18] Such alternative resource definitions have accounted for noncash benefits and the deduction of income taxes for example.

B. Examinations of Poverty Measurement

Each of the concepts and various definitions of thresholds and resources have been examined. Among those who have focused extensively on U.S. poverty measurement most recently are Patricia Ruggles,[19] the Joint Economic Committee of Congress,[20] and the National Academy of Sciences Panel chaired by Robert T. Michael,[21] referred to earlier. In ***Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy*** (published in 1990), Ruggles focused mainly on alternative concepts of poverty and methods for measuring poverty; she also proposed methods to update and revise the poverty threshold and resource definitions. The Joint Economic Committee held Congressional hearings in the early 1990's in response to Ruggles' book and her activities on the Committee staff. As a result of those hearings, the National Research Council (NRC) of the National Academy of Sciences (NAS) Panel on Poverty and Family Assistance was given the responsibility to conduct the review. In 1995, the Panel issued ***Measuring Poverty: A New Approach***.

The Panel recommended, as did Ruggles, revising the current poverty measure to more accurately reflect trends in poverty over time and differences in 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

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[18] Also see: U.S. Bureau of the Census, ***Estimates of Poverty Including the Value of Noncash Benefits: 1984.*** Technical Paper 55. Washington, D. C.: U.S. Government Printing Office, 1985; U.S. Bureau of the Census, ***Measuring the Effect of Benefits and Taxes on Income and Poverty: 1986***. Current Population Reports, Series P-60, No. 164-RD-1. Washington, D. C.: U. S. Government Printing Office, 1988; U.S. Bureau of the Census, ***Poverty in the United States 1995***. Washington, D. C.: U. S. Government Printing Office; 1996; Citro and Michael 1995; Ruggles 1990.

[19] Ruggles, 1990.

[20] See ***The War on Poverty, Hearings Before the Joint Economic Committee, Congress of the United States, 102nd Congress, First Session, July 25, September 25, and November 19, 1991, S. HRG. 102-631***. Washington, D. C.: U.S. Government Printing Office, 1992.

[21] See Citro and Michael 1995.

definitions would reflect social and economic changes. This is in contrast to the method currently followed for updating the official poverty thresholds which only allow for changes in prices, as noted earlier, not for changes in consumption patterns over time. With this report, 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 which includes aspects of both the absolute (budget based) and relative concepts.[22] Details concerning the hybrid approach and the new resource measure are presented in section three.

In general, the Panel proposed eight broad sets of recommendations (see Appendix A for details) which focus on the following:[23] (1) adopting a new poverty measure; (2) setting and updating the poverty threshold; (3) adjusting the threshold; (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 include that it should be:

- understandable and broadly acceptable to the public,
- statistically defensible (e.g., internally consistent), and
- operationally feasible.[24]

The Panel used recent data and applied results from scientific studies to help guide them in their recommendations. However, they freely admit that ultimately they made subjective decisions at various times in the process.

III. NAS Panel Procedures and Findings

A. Defining the Thresholds

[22] One measure that Statistics Canada uses to determine the low income status of families, similar to family poverty, is the set of "low-income cut-offs" (LICOs). The LICOs 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 1995, pp. 127-128).

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

With reference to the poverty thresholds, the Panel stated generally that: [25]

- The poverty thresholds should represent a budget for food, clothing, shelter (including utilities), and a small additional amount to allow for other needs (e.g., household supplies, personal care, non-work-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 in 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.

Weighted expenditure data from the 1989-91 Consumer Expenditure (CE) Interview Survey are 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[26] are obtained from the CE data for a reference family type. The reference family was defined as including two adults and two children. Their criteria is 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…"[27] The two-adult/two-child family meet these criteria. Multipliers are applied to the basic bundle to add a small additional amount to allow for other needs, such as housekeeping supplies, personal care, and nonwork-related transportation. Two sets of thresholds are produced, with one allowing for greater needs than the other (see below). Thresholds for additional family types are derived by applying an equivalence scale to reflect differences in family composition and needs. These thresholds are then adjusted to account for differences in the cost of housing by size of metropolitan area within nine regions of the country.

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[24] Citro and Michael, 1995, p. xvii.
[25] Citro and Michael, 1995, pp. 4-5.
[26] 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 non-food 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.

Expenditures are defined as the transaction costs, including excise and sales taxes, for these commodities acquired during the interview period. Expenditures include those for gifts, but exclude the value of purchases or portions of purchases directly attributable to business purposes. Also excluded are periodic credit or installment payments on commodities already acquired. Expenditures for vehicle purchases include 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 are included in expenditures; however, mortgage interest and related charges are included. The Panel notes that this definition of the shelter costs for homeowners is used for processing convenience.[28]

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."[29] This requirement reflects the *relative* component of the hybrid poverty measure. The procedure for creating a time series of thresholds under the Panel's concept is to pick a percentage of median expenditures for food, clothing, and shelter (the basic bundle) and a multiplier (to account for the "a little bit more") using data for a base period. With this information, a base year threshold would be established first, then the same percentage and multiplier would 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, shelter, and clothing.[30] The intent underlying this procedure is to drive the change in the thresholds by changes in median spending on food, clothing, and shelter and not by changes lower down in the distribution.[31] Changes in the expenditures for these commodities have historically increased by more than the rate of inflation but by less than the rate of growth in

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[27] Citro and Michael, 1995, p. 101.
[28] Citro and Michael, 1995, p. 148.
[29] Citro and Michael, 1995, p. 148.
[30] The Panel chose to 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, and shelter to a starting-year threshold. Both approaches are the same algebraically and produce the same results (Citro 1996).

total expenditures, providing for a quasi-relative updating of the poverty thresholds.[32] The Panel recommended that the thresholds be updated annually using an average of the most recent three years of CE data to produce the medians. The three year average approach was recommended to increase the sample size and also to smooth out year-to-year changes in the thresholds; however this approach produces thresholds that lag behind changes in real consumption.[33] To conduct their analysis, the Panel used data from all consumer units participating in the CE in 1989-91. Each quarter approximately 5,000 consumer units[34] are interviewed using the CE Interview Survey. Based on the 1989-91 CE data, about 9 percent of all consumer units interviewed have the characteristics of the reference family, that is, the two-adult/two-child family. To implement the recommendations, the Panel assumed that the quarterly interviews are independent and produced annual expenditures by multiplying each consumer unit's record of expenditures by four. All expenditures are converted to 1992 constant U.S. dollars. For example, if the collection quarter of the data occurred some time during 1989, the 1989 expenditures are updated using the change in overall prices between 1989 and 1992.

To implement this recommendation, consumer units are ranked based on their expenditures for the basic bundle and placed into 20 equal groups or vingtiles. For each vingtile, means for the basic bundle and percentages of the median are 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

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[31] 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 percentiles, for example. It would not be desirable for the poverty threshold or standard of need to reflect this greater reduction (Citro 1996).

[32] Citro, Connie, comments on paper presented during the 1996 Society of Government Economists Conference session on Inequality and Poverty, November 22, 1996.

[32] Fisher, Gordon, "The Development and History of the Poverty Thresholds," ***Social Security Bulletin***, vol. 55, no. 4, Winter 1992, p.10.

[32] Also see: U.S. Bureau of the Census, ***Estimates of Poverty Including the Value of Noncash Benefits:***

[33] Citro and Michael, 1995, Table 2-7, p. 156.

[34] 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 expenses categories: housing, food, and other living expenses. To be considered financially independent, at least two of the three major expense categories have to be provided entirely or in part by the respondent.

utilities) are used to represent the 5th percentile. Each of the vingtile mean expenditures was divided by the mean expenditures at the 50th percentile. The multipliers proposed depend upon some value for the basic bundle. The Panel used the means of the vingtiles rather than the value for the consumer unit at each vingtile thereby increasing the sample size for each vingtile and ensuring that the data are consistent over time. This is also the procedure used to construct the experimental poverty measures.

As noted earlier, multipliers are applied to the value of the designated basic bundle (reflected 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 the: (1) basic bundle plus those for personal care and one-half of transportation;[35] and (2) basic bundle plus personal care, one-half transportation, education, and reading materials costs.[36] In the report, the Panel states 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."[37] This allocation is consistent with other studies.[38]

The panel's determination of what to include in "a little bit more" was constrained by what was available in the Interview Survey (e.g., some personal care items and household supplies, which would seem natural candidates to include in the multiplier bundle, are only available from the Diary). However, a bigger point is that

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[35] ***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 air fares), and vehicle rentals, licenses and other charges. In addition, transportation included the total purchase price (minus the trade-in value) on 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.

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

[37] Citro and Michael, 1995, p. 151.

[38] 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 *Expenditures on Children by Families, 1995 Annual Report*, Center for Nutrition Policy and Promotion, USDA, page 5, and U.S. Department of Transportation, Federal Highway Administration, 1994, *1990 Nationwide Personal Transportation Study*.

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.[39] Other commodity bundles could have been assumed.

The Panel concluded from a review of their tabulations that a reasonable range for the multiplier is 1.15 to 1.25, which allows for a poverty threshold that ranges from $13,700 to $15,900 (in 1992 dollars rounded). The 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 their multipliers as corresponding to those at or below the median level of expenditures for the basic bundle. This range of multipliers compared favorably to ones estimated in other studies[40] which range from 1.14 to 1.30. (The calculation method is described in Appendix D using our definitions of expenditures as an example.) The general formula for deriving the proposed reference family threshold is:

$$T = \left[\frac{(M1 * \%m) + (M2 * \%m)}{2} \right] * \textit{housing index} \qquad (1)$$

where T = the reference family poverty threshold,
$M1$ = the multiplier for a smaller additional amount, (1.15 for the Panel's estimate)
$M2$ = the multiplier for a larger additional amount, (1.25 for the Panel's estimate)
% = some percentage, (0.78 & 0.83 for the Panel's estimate), and
m = median expenditures for the basic bundle of food, clothing, shelter, & utilities.

[39] Citro 1996.

[40] 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. 573-582; Bureau of Labor Statistics, ***Urban Family Budgets and Comparative Indexes for Selected Urban Areas***. USDL 82-139. Washington, D. C.: U.S. Department of Labor, Autumn 1982; John E. Schwarz and Thomas J. Volgy, ***Forgotten Americans.*** New York: W. W. Norton and Company.

Next the thresholds were adjusted to reflect geographic differences in the cost of housing.[41] Housing cost indexes, calculated from the 1990 Census data on gross rent for apartments with specified characteristics, adjusted to reflect the share of housing in the proposed poverty budget, were used.[42]

Equivalence scale adjustments are next 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:

$$scale\ value = (A + PK)^F \qquad (2)$$

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, and
F = the scale economy factor.

Specifically, the Panel recommended that P be set at 0.70 such that the needs of children are treated as 70 percent of those of an adult, and the scale economy factor, F, be set in the range of 0.65 to 0.75. The values of the resulting scale is most consistent with the Rothbarth scales reported by Betson and Betson and Michael.[43] The equivalence scale implicit in the current poverty thresholds are criticized for the way it varies across family size and for the distinction it makes between elderly and non-elderly families.[44] The variation across family size

[41] As did the Panel, we adjusted the thresholds in Table 4 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 E. (The thresholds shown in Table 4 are not adjusted for geographic differences.)

[42] For a description of the housing adjustment, see Citro and Michael, 1995, pp. 194-199, 249, 252-253.

[43] See citations in Citro and Michael, page 177.

[44] 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 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.

is due the irregularities in the economies of scale implied by the current scale.. Using the scales proposed by the Panel smoothes out these irregularities while producing thresholds that are 'reasonably close' to the official thresholds. The Panel describes their proposed method as the "most defensible of existing methods."[45] The data in Table 1 compare the equivalence scale that is implied by the official poverty threshold and the two scales proposed by the Panel.[46] The scales recommended by the Panel improve the current official scale but do not "represent a great departure from the current implicit scale for particular population groups."[47] The proposed scale with a scale economy factor of 0.65 produces thresholds that are "reasonably close" to the official thresholds—somewhat higher for families with two and three members and somewhat lower for singles and families with five to seven members.

The Panel produced three sets of thresholds: (1) using a $13,175 reference family threshold to keep the overall poverty rate at 14.5 percent; (2) using a $14,800 reference family threshold and a scale economy factor of 0.75; and (3) using 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.

B. Defining Resources

As noted earlier, under the definition of poverty currently used in the U.S., a family is defined as poor if its resources, defined as its gross (pre-tax) annual money income, is below that family's annual poverty threshold. In making their recommendations for a redefined U.S. poverty measure, the Panel recommended sweeping changes to the definition of resources used to define poverty status. Resources should be defined as the sum of

[45] Citro and Michael, 1995, p. 176. Also see: 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, Indiana;

[46] 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 (Citro and Michael, 1995, page 165).

[47] Citro and Michael, 1995, p. 180.

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 should account for the: [48]

- addition of the value of in-kind government subsidies (food stamps, public housing, rent subsidies, school lunches)
- subtraction of taxes paid (federal, state, and local income taxes, and Social Security payroll (FICA) taxes)
- subtraction of child support paid
- subtraction of expenses related to work (subtract a flat amount per week worked)
- subtraction of child care necessary to work (e.g., subtract amount limited to $2,400 for one child and $4,800 for two or more children in 1992)
- subtraction of medical out-of-pocket expenditures (including health insurance premiums).

In making their 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, and a small additional amount for other needed consumption). Thus, for example, since medical needs are not included in their recommended needs measure, the value of medical assistance is not included in their recommended resource measure. The recommendation not to include the value of medical assistance is perhaps the most controversial of the Panel's recommendations with regard to resources; the effect of this recommendation on the composition of the poverty will have to be examined, since medical needs and benefits are by far the most important component excluded from the proposed redefined measure. A point of inconsistency with respect to the economic resources of home owners versus renters remains. Since the flow of services from owner occupied housing is accounted for in the thresholds it also should be accounted for in the resources of the family. However, the Panel stated it did not believe that data available at the time of their research were adequate to produce values for the flow of services on the resource side.[49]

Since 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 the CPS 1993 March Supplement public

[48] Based on briefing materials prepared for ***Measuring Poverty: A New Approach***, 1995 and the primary report.

use tapes; data refer to 1992. The value 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) are from an enhanced file prepared by the Census Bureau. An experimental market value approach is currently used by the Census Bureau to impute these values.[50] Out-of-pocket medical expenditures are imputed using tabulations from the 1987 National Medical Expenditure Survey (NMES), aged to represent the 1992 population. Matches are made using age and health insurance information from both the CPS and NMES. Child care expenses were imputed using regression equations on 1990 SIPP panel data. Other work-related expenses are imputed using 1987 SIPP.[51] 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.[52]

IV. Methodology Followed in This Study

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.

A. Replication of Multipliers

Using the same definition of expenditures as did the Panel, we attempt to replicate the multipliers that the Panel presented in Table 2.6 of the report using CE data from 1989-91. The Panel recommended the use of a

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[49] Citro and Michael, 1995, p. 71.

[50] For the most recent estimates of the government subsidies and taxes paid and their potential impact of poverty rates, see Current Population Report, Series P-60-194, ***Poverty in the United States: 1995***. U. S. Government Print Office: Washington, D. C., 1996.

[51] See Citro and Michael, 1995, p. 256. 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 are not subtracted in the Panel's report, nor in this paper, because the necessary information is not on the CPS file (pages 244-45). The panel did look at the likely effect on the poverty rate by looking at SIPP data, which showed that the overall poverty rate would increase 0.3 to 0.5 percentage point (page 267), if child support was subtracted from the payers' income.

[52] Citro and Michael, 1995, p. 257.

multiplier to be applied to the basic bundle of the poverty threshold so as to allow a small fraction for other needed expenditures. Stability of the thresholds is assessed 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 (for homeowners, shelter expenditures include those for mortgage interest, taxes, maintenance, and repairs; shelter does not include principal payments), and utilities, are presented in Table 2 by vingtile. The means presented by the Panel using the 1989-91 data and means using the same period data are quite close, but ours are more often slightly higher.[53] 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 are slightly higher using the 1992-94 data (means are presented in constant 1992 dollars); however, the differences are quite small in general when the more recent data are used.

Table 3 includes 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 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.

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 when the largest bundle is assumed. As with the means of

[53] 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 97.5 and 100th percentile range; we expect that the Panel's value is actually the top value in the data file for the reference family, not the mean for any range.

the basic bundles, the Panel and our replication multipliers appear to be quite similar. For the 30th and 35th percentiles, the multipliers are within 0.02 points 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.

Reasons for differences between the published report and our replicated results for 1989-91 are due to corrections and improvements in the CE database. For example, summary expenditure variables have recently been added to the CE database back to 1980, where consistent definitions across time are used. Minor discrepancies may also exist because of the speed and volume of the data analysis which 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. These results also suggest that thresholds obtained using this methodology would be stable over the 1989-94 time period.

B. Defining the Thresholds

In this section we review the procedure and results which we obtained following two of the Panel's suggestions (from the Panel's report or the 1993 Maritato memorandum) that were not implemented in the report. These two suggestions refer to how shelter costs for homeowners are incorporated in the thresholds and how transportation expenditures are defined. We also examine the sensitivity of the Panel's assumptions with respect to the multipliers and economies of scale factor assumed. 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 apply a different equivalence scale factor. This same averaging is used to construct the other experimental thresholds described below. We use a scale factor of

0.70 to obtain the thresholds for other family types to simplify the analysis;[54] the Panel produced thresholds using scale factors of both 0.65 and 0.75.[55] Making this adjustment results in thresholds which we refer to as "Bundle 1 Thresholds."

Second we follow the Panel's recommendation to replace the shelter costs for homeowners by a rental equivalence value which 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 which 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 is the range suggested by the Panel but the estimated multipliers are still within the suggested range. To estimate the multipliers used here, an outlays approach to transportation expenditures replaces the Panel's original approach of including the total purchase price of the vehicle.[56] 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.

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. The estimated multipliers based on this bundle of commodities are assumed, 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.

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

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

Each set of thresholds are constructed for 1990 through 1995 using expenditure data from the 1987 through 1994 CE Interview Survey. The three year moving average approach, with the CPI-U adjustment, is followed. For each set of thresholds, the basic bundle of expenditures for the reference two-adult/two child family is calculated. The basic bundle definition only changes with respect to shelter. The alternative transportation expenditure definition affects the thresholds through the multipliers. As before, the basic bundle is used to rank the families and then to divide the families into vingtiles. The resulting means, estimated multipliers, and scale factor are used to produce the thresholds.

We primarily assess the impact of the Panel's recommendations by examining poverty rates resulting from the use of the different sets of thresholds. However, for illustrative purposes, in Table 4 we present Bundle 1 and Bundle 2 Thresholds for singles and couples with and without children to examine the impact on the thresholds of introducing one of the Panel's recommendations. Over the 1990-1995 period, the two-adult/two-child thresholds increase 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. The thresholds are stable over the limited period of time examined. The thresholds presented in Table 4 are not adjusted for geographic differences in housing costs; however, housing cost adjustments are made for each set of experimental thresholds which are used to produce the poverty rates presented in Tables 5A, 5B, and 5C.

B. Defining resources

The resource measure used for this paper is very similar to the one presented in the Panel report. For each year of data, 1990-1995, we use the corresponding March CPS file as the base to define resources. For each year, the values of in-kind government subsidies and taxes paid, imputed by the Census Bureau and added to the March CPS micro data, are employed in the calculation of resources. Work-related expenses (including

[56] As noted earlier, this approach was followed for ease in processing and because of the quick turnaround required to produce the

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 should be pointed out with respect to the resource definition and data used before we present our results. 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 the Panel employed for 1992, and adjust the dollar amounts for different years based on (1) the CPI for child and work expense and (2) the medical CPI for medical expenditures. Medical expenditures over time also reflect changes in the cost of part B Medicare coverage.[57] 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 why the 1992 resource estimates are different from those used by the Panel. First, they reflect improvements made to the medical out-of-pocket expenditures by including part B Medicare costs,[58] which were excluded from the Panel's imputation, as noted earlier. Second, the Panel estimates are based on a public use file that employs income topcoding, and 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. Fifth, the March

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estimates.

[57] Dave Betson, a member of the NAS Panel, is conducting research to incorporate into the resource measure, revised the medical out-of-pocket expenditures. His study will be released by the NAS in the near future (Citro 1996)

[58] David M. Betson, "Poor Old Folks: Have Our Methods of Poverty Measurement Blinded Us to Who Is Poor?" unpublished paper, October 1995. Available from the author at the Department of Economics, University of Notre Dame, South Bend, Indiana.

1993 file used here was revised using 1990 Census controls; the estimates in the Panel report used the 1980 Census controls. In this paper we do not present average resources for the population, only the impact of using different thresholds and testing our resource measure.

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 the taxes and work-related expenses that reduce the spendable income of workers relative to non-workers) and overstates the poverty rate of non-workers (in that it fails to account for the noncash benefits that non-workers 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. We begin such a systematic process to evaluate the Panel's recommendations with this study.

V. Results Based on Experimental Thresholds and Resource Measures

In this section we try to answer two questions: (1) How would the proposed measure change our view of how poverty rates for different demographic groups have changed over time?, and (2) How would the proposed measure change our view of who is poor? In Tables 5A through 5C and Table 6, the official poverty rates for different demographic groups for 1990 through 1995 are compared to the poverty rates that we produced following the Panel's proposed methods (Threshold Bundles 1 and 2). In the text table below, three sets of poverty rates for 1992 for selected demographic groups are presented: the official rates, the rates produced by the Panel (NAS1 and NAS2) and the rates we produced by using Threshold Bundles 1 and 2 (B1 and B2); also

shown are standardized changes in the rates compared to the official rates. In Table 6, we present the distribution of the poverty population for 1992 as defined by these groups. Table 7A and 7B include the distribution of the poverty population when Multipliers A1, A2, A4, and A5 Thresholds are assumed.

A. Poverty Rates

At these very early stages of analyzing the effect of the Panel's recommendations, it is probably not wise to focus too much on the level of poverty rates, but rates are important as a starting point from which one can examine trends and the composition of 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, 5.1 percentage points above the official poverty rate of 14.8 percent (see text table below). The B1 poverty rates are similar, although slightly higher,[59] than 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 (Table 5A). The official rate rose from 13.5 to 15.1 percent from 1990 to 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. Thus, the poverty rates are stable over time, and change as expected based on the point in the business cycle that the economy is at.[60]

Obviously, there are many factors that account for differences between the official and modified poverty rates, for example, 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

[59] 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 not included in the NAS resource definition.

examine these differences, we follow the Panel's method to examine the differences in poverty rates in terms of standardized percentage point changes. The changes are standardized for each group to be comparable to the total population.[61] The standardized changes are summarized in the text table below.

[60] The stability may be due to how 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.

[61] 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 since "it is awkward to speak of percentage changes in a percentage." See Citro and Michael, page 262.

Poverty Rates and Percentage Point Changes: Official Rates Compared to Rates Based on Experimental Measure Produced by the Panel and in this Paper, 1992

	Poverty Rate (%)					Percentage Point Change-(standardized) [1]			
	Official	**NAS1[2]**	**NAS2[2]**	**B1[3]**	**B2[3]**	**NAS1**	**NAS2**	**B1**	**B2**
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	3.1	3.0	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	1.1	1.6	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	7.3	8.0	8.1	12.7
White	11.9	15.3	16.1	17.1	20.1	4.6	5.7	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	5.7	10.9	15.5

[1] Standardized percentage point change = (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 used scale economy factor 0.75; NAS2 used scale economy factor 0.65. See Citro and Michael, Table 5-8, page 265.
[3] B1 and B2 are the poverty rates based on Basic Bundles 1 and 2 thresholds respectively. (See IIIA for estimation methodology.)
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.

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's examine this 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 relatively lower official poverty, the percentage increase in the rates based on the experimental thresholds are relatively large. The standardized change in poverty rates for persons 18 to 64 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 higher than the official poverty rate. The percentage point changes in the poverty rate for families with at least one worker is 8.1, and 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 since Threshold Bundle 2 is higher than Threshold Bundle 1.

B. 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 are 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 comprise 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 female householder families (49.1 versus 37.6 percent). In contrast, all other groups noted in Table 6 comprise a greater percentage of the poor when the experimental measures are used. The greatest percentage increases are for the elderly (an increase in poverty of 30 percent based on rates of 10.3 and 13.4 percent) and for persons living in married couple families (an increase in poverty of 24 percent based on rates of 45.9 and 57.1 percent). Also noteworthy is the increase in the percentage of the poor living in families where there is at least one worker present; this proportion increases by 15 percent (55.1 versus 63.5 percent of the poor).

In answer to the question, "How does the new poverty measure change our view of who is poor?" the answer is that the poverty population will look more like the total population. Due to the subtraction of work-related expenses we see more persons in families with a worker, more persons aged 18-64 years, and more persons in married couple families among the poor. We also see fewer persons in families that receive cash or near-cash government transfers in the poverty population. Persons in families with children, in families with no

workers, and those in female-householder families, who are more likely to receive benefits, are 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.

C. Other Thresholds

The results from changing the multipliers from 1.15 and 1.25 to the *computed* multipliers, in order to account for "a little bit more," are presented in Tables 7A and 7B for 1992 in terms of population characteristics; 78 and 83 percent of median expenditures are still used as basis to derive 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 Table 7A.

The thresholds which we use in the immediately 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 Tables 7A for the number of persons under the thresholds and Table 7B for the percentage distributions).

Adding in expenditures for education and reading (reflected in Multiplier Thresholds A2 and A5), shifts the overall poverty rates up only slightly (Table 7B), 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.

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 (Table 7B). However, differences do result. For example, if we compare the percentages based on Bundle 1 and 2 Thresholds, we find a decrease of 4 percent for Blacks (23.5

versus 22.6) , 5 percent for persons living in families with no workers (from 36.5 to 34.5 percent) and 5 percent for persons living in female headed households (37.6 versus 35.6). The same definitional change results in increases in the percentage distributions of 3 percent for persons living in families with at least one worker (63.5 versus 65.5) and 4 percent 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 being that poverty rates for the elderly are higher under the experimental measures than those reported; this is due to the inclusion of Medicare part B premiums in the medical out-of-pocket amounts deducted from income.

VI. Summary and Conclusions

In this paper, we have replicated, documented, and examined the methodology for poverty measurement based on recommendations by the National Academy of Science's Panel on Poverty and Family Assistance. Our findings reveal that the thresholds seem to be stable over time and across various definitions of what to include in a 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 the official definition. Generally, the poverty rates follow trends over time similar to the current 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 the expected direction as anticipated from the Panel's report. That is, the poor are more likely to be white, married, and to have a member of the family in the workforce.

Our approach to this research is incremental in that we are implementing Panel recommendations and suggestions one at a time to analyze their impact on poverty rates. Two suggestions implemented here for the

thresholds are the use of transportation outlays, rather than including the total purchase price of the vehicle, and an estimate for the flow of services from owner occupied housing to replace the homeowners' shelter costs used by the Panel. The first change affects the multipliers but only minimally. The second change affects the definition of the basic bundle and justifies a higher threshold. A large difference in thresholds, and hence poverty rates, occurs when homeowners' shelter costs are replaced with a rental equivalence value for the flow of services. Also when expenditures for reading and education are added to those for personal care and transportation (based on Multipliers A2 and A5), the thresholds and poverty rates increase.

While it is true that the poverty measures as presented here are very stable over time, this is partially due to the way the resource measure is constructed. Several elements of the resource measure only changed over time based on price indexes, thereby inducing some stability. If these elements were instead updated independently on an annual basis, we might observe a somewhat more erratic trend in poverty using the new measure.

There is no national survey that currently collects all of the information necessary to portray a family's poverty status under the proposed measure. This can be a tremendous challenge for the federal statistical community particularly given the recent welfare reform and greater need for state level data. The SIPP collects most of the information one would need to estimate resources, with the notable exception of out-of-pocket medical costs, while the CE collects most of the information needed to estimate thresholds, with the exception of participation in school lunch programs. However, there are still questions concerning sample size and representativeness.

If we adopt a more complex definition of resources, as specified by the Panel to define official poverty in the U.S., the poverty definition would no longer be "portable" across surveys. This is particularly important when one considers the decennial Census, which is currently the only source of small area poverty data; decennial poverty data are used to allocate billions of dollars in Federal funds annually. The 1990 Census long form

included questions on money income only. A challenge for us in the future, if the Panel's resource recommendations are largely adopted, would include the use of decennial funding poverty formulas to make extensive use of modeling to impute the components of the resource definition.

Future poverty measurement research includes refinements in the thresholds and further examinations of the resource measure. Concerning the thresholds, our next step will be to test the impact on our experimental thresholds of using consumer units for whom a complete year of expenditures can be derived.[62] (The Panel recommended that full year consumer units reporting expenditures for 12 months be used in the future for the development of the thresholds if the sample size is adequate.) However this introduces a new problem in that the sample no longer represents the population.[63] The use of longitudinal weights, which account for 12 month participation in the survey, will be explored and tested. Another issue to be addressed is which Consumer Price Index (or indices) should be used to update the basic bundle of expenditures. We will examine the impact of using the CPIs for the commodity bundle of interest rather than the all-items CPI-U. Other refinements include using different methods to account for the service flows obtained from vehicles—for example, straight line depreciation, hot deck imputation, and hedonic methods. Other methods to estimate the service flows from owned housing also will be considered. An examination of rental equivalence reporting errors, and a comparison of rental equivalence values with imputed rent using hedonic regression will be undertaken.

The issue of how to adjust the poverty thresholds for geographic differences in the cost of housing and in the cost of living is also an area for further research.[64] The procedure used by the Panel and in this research is a "modest step in the right direction," in that it is understandable, operationally feasible, and produces results that

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[62] This may not change the median threshold, but should decrease the dispersion in the means at each vingtile. It is expected that the means at the 30th and 35th vingtile for the basic bundle will increase.

[63] Recent research reveal that expenditure data are less volatile when consumer units who fully participate are used in the sample. For an example, see: David Johnson and Stephanie Shipp "Trends in Inequality Using Consumption Expenditures: The U.S. from 1960-1993," ***Review of Income and Wealth***, forthcoming, June 1997.

[64] U.S. General Accounting Office, ***Poverty Measurement: Adjusting for Geographic Cost-of-Living Difference***, GAO/GGD-95-64, March 1995; Kokoski, Mary F., Patrick Cardiff, and Brent Moulton***, Interarea Price Indices for Consumer Goods and Services: An Hedonic Approach Using CPI Data***, BLS Working Paper No. 256, Bureau of Labor Statistics, Washington, D. C., 1994.

conform to other research.[65] However, the procedure does not account for housing costs differences *within areas*, for example, differences in costs between central cities or suburbs of large metropolitan areas, or for differences resulting from special circumstances such as living in areas like Alaska and Hawaii versus in other areas of the Pacific region. The method also does not account for quality differences. These are topics that will require further research and development.

Another avenue of research being considered within the BLS is to estimate the set of resources recommended by the Panel, in addition to the thresholds, using CE survey data. Such an option is possible since the CE contains most of the necessary components needed for computing resources as well. The CE survey collects data on income, income taxes and Social Security payroll taxes, various government subsidies (e.g., food stamps, public housing, and rent subsidies), child support payments, child care costs, and out-of-pocket health expenditures, including health insurance premiums. Detailed transportation data are also available, and although work-related expenditures cannot be calculated directly, the survey contains information which can be used to estimate work-related travel. Child care costs associated with work also can be estimated from child care expenditures already being collected. The flow of services from owner occupied housing that we used in defining Bundle 2 Thresholds can be added to the resource side; rental equivalence or hedonic regression analysis can be used to estimate these costs. The imputation methods for specific expenses currently employed for use with CPS and SIPP data could be tested using the CE data. At the present time, income is not imputed for missing values in the CE; however, a project is underway to test imputation methods to account for such missing data[66] (imputations already are applied in the CPS and SIPP); income data from these test files would be used as the basis of the CE resource measure. Possible concerns with the current CE as a source of data to

[65] See Citro and Michael, 1995, page 199.
[66] See Geoffrey Paulin, "Income Imputation: Does It Work In Practice? Applications of Experimental Data in the Consumer Expenditure Survey," paper presented at the Allied Social Science Meetings, New Orleans, LA, January 4, 1997.

produce poverty statistics is that the sample size is relatively small and income data are not as detailed as in the SIPP.

Another option is to define resources in terms of consumption expenditures or consumption, also using data from the CE. Using consumption expenditures and consumption to determine thresholds and poverty status both relatively and absolutely is not new and has been used and often favored by researchers in the U.S.[67] as well as in Europe.[68] In the future the CE Interview questionnaire could be modified to better capture the data needed to improve the estimation of the thresholds and resources. For example, we hope to conduct cognitive work to identify what is included in a set of needed commodities for families based on the judgments of poor families, for example, rather than strictly to use the set identified by some 'expert team.' Preliminary cognitive work[69] has been completed and could provide input into this future work. On the resource side, modifications could be made in the CE questionnaire to ask about work-related expenditures, specifically those for transportation and child care. Improvements in the collection of information on transfer program participation (e.g., school lunches) could also be introduced. Combining the estimation of thresholds and resources from one survey would provide consistent measurements efficiently. Using the CE as the sole data source for developing the thresholds and estimating resources would lead to comparisons with results based on CPS and SIPP data. Expanding the analysis to a longer time frame is also important, since the "key to evaluating the threshold

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[67] See, for example: Cutler, David M. and Lawrence F. Katz, "Macroeconomic Performance and the Disadvantaged," ***Brookings Papers on Economic Activity***, 1991, pp. 1-74; Cutler and Katz, "Rising Inequality? Changes in the Distribution of Income and Consumption in the 1980s, ***American Economic Review***, vol. 82, no. 2, 1992, pp. 546-551; Federman, Maya, Thesia I. Garner, Kathleen Short, W Boman Cutter IV, John Keily, David Levine, Dauane McGough, and Marilyn McMillen, "What Does It Mean to be Poor in American, ***Monthly Labor Review***, May 1996, pp. 3-17; Slesnick, David, "Gaining Ground: Poverty in the Postwar United States," ***Journal of Political Economy***, February 1993, pp. 1-38; Mayer, Susan and Christopher Jencks, "Has Poverty Really Increased Among Children Since 1970?" Working Paper 94-14, Northwestern University, Center for Urban Affairs and Policy Research, 1995; Passero, William "Spending Patterns of Families Receiving Public Assistance," ***Monthly Labor Review***, April 1996, pp. 21-28.

[68] See Hagenaars, A.J.M., Klaas de Vos, and M. A. Zaidi, ***Poverty Statistics in the Late 1980s: Research Based on Micro-Data.*** Study carried out for Eurostat, Office for Official publications of the European Community, Luxembourg, 1994; Tsakloglou, Panos, ***Comparison of Poverty Rate Estimates Using Expenditure and Income Data***, Luxembourg Income Study, Working Paper No. 71, Luxembourg: Statistical Office of the European Communities.

concept is how it behaves over time."[70] This would involve producing a consistent set of thresholds over the 1980 to 1995 period and then comparing them to other absolute thresholds and to relative and subjective thresholds. These thresholds could be based on income, consumption expenditures, or consumption.[71] If some variations of the threshold concept show sharp ups and downs over time, for example, then they would appear to be less desirable for updating the base-year threshold. This over time comparison between the proposed thresholds with relative thresholds also could be used to study the effects of the business cycle on the thresholds. What one would hope is that the Panel's thresholds would show some of the effects of the business cycle, but not as pronounced an effect as would a purely relative threshold.[72]

On the resource side additional opportunities for research present themselves. Researchers within the Census Bureau are currently examining nearly every dimension of the resource measure that we employed in this experimental study. For example, the imputations used in our measure for work-related expenses, including child care costs, are based on methods used by the Panel. Work at the Census Bureau, examining various measures in the SIPP and the CPS, suggests alternative methods for imputing such costs.[73] We are also reviewing the current method used to value housing subsidies. We hope to be improving these values for the CPS as well as implementing a valuation procedure in the SIPP. Various valuation methods are being considered, including using recent data from the American Housing Survey or using Fair Market Rents directly in our calculations of

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[69] See Thesia I. Garner, Linda Stinson, and Stephanie Shipp, "Affordability, Income Adequacy, and Subjective Assessments of Economic Well-Being: Preliminary Findings," Association for Consumer Research Conference, October 10-13, 1996, Tucson, Arizona.

[70] Citro, 1996.

[71] A recent study on the relationship between income, consumption expenditures, and consumption which could be used as a basis for producing relative poverty thresholds and testing alternative definitions of resources for poverty measurement has been conducted by David Johnson and Timothy Smeeding ("Measuring the Trends in Inequality of Individuals and Families: Income and Consumption," presented at the Allied Social Sciences Annual Conference, New Orleans, January 1997).

[72] Citro, 1996.

[73] Kathleen Short, Martina Shea, and Teresa Eller, "Work-Related Expenditures in a New Measure of Poverty," paper presented at the 1996 Meetings of the American Statistical Association, Chicago, IL., August 1996.

subsidies.[74]

Work is also proceeding on the imputation of medical out-of-pocket expenses. We are aware that the method used here, and in the Panel report, needs much work. Corrections need to be made to the current method of valuing medical expenses, even if there was agreement that this is the best method to use. Statistical matches across surveys may provide the most promising method of imputing these expenses. Questions are being added to the 1996 SIPP to improve this measure and facilitate statistical matches between SIPP and the 1997 Medical Expenditure Panel Survey (MEPS).

One element of the Panel's resource measure recommendations not considered in this study was that we did not subtract child support payments paid from the resource measure. The Panel also did not subtract child support payments from the income of the payer because the information was not available in the CPS.[75] However they were able to examine the likely impact of doing this from SIPP data, which indicated that subtracting child support payments from the income of the person paying them would increase the poverty rate by 0.3 to 0.5.[76] Questions were added to the April 1996 CPS in order to examine the feasibility of capturing this information on a regular basis to improve the income measure in that survey. Since this information has been regularly collected in the SIPP, it would be used in a SIPP-based measure of resources. The resource measure presented here is based on the CPS. We are currently working to implement the measure in the SIPP. Much of this work has been accomplished. The largest challenge remaining has to do with simulating taxes in order to arrive at an after tax income measure. Finally, at the Census Bureau, some questions in the National Content Survey, part of the testing for the 2000 Census have been added which focus on various items relevant to poverty measurement such as food stamps and health insurance coverage.

[74] Eller, T. J. and Mary Naifeh, "Housing Subsidies: Effects on Estimates of Poverty," paper to be presented at the Meetings of the American Statistical Association. Anaheim, California, August 1997.
[75] See Citro and Michael, 1995, page 210.
[76] See Citro and Michael, 1995, page 267.

Since the flow of services for housing is included in the thresholds, consistency requires that the same value be added to resources for homeowners because it is implicit income for these households. This is especially important for the elderly, many of whom own their home without a mortgage. The flow of services for housing will be included in resources in the next phase of research.

The research presented in this paper is not intended to provide an exact specification for poverty measurement, but to examine the impact of implementing recommendations and suggestions for such measurement as provided by the Panel. The aim of the Panel was to propose a procedure to follow which would result in major changes in how we identify the poor in the United States. Specifically, the Panel recommended:

> 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 measures 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.[77]

This research has made us, as members of the federal statistical community, much more aware of the issues involved in introducing such major changes. Through our increased understanding, we hope to be in a better position to make such changes if requested.

[77] Recommendation 1.1, Citro and Michael, 1995, p. 4.

Appendix A: Summary of NAS Panel Recommendations[78]

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 (e.g., household supplies, personal care, non-work-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 in 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 (e.g., 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 premium.

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.

[78] Citro and Michael, 1995, pp. 4-15.

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 (i.e., the number of adults plus 0.70 times the number of children), and then by 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 hosing 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 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 under coverage, 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, etc.) 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 estimated 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 CEX for the purpose of developing poverty thresholds, for making it possible at a

future date to measure poverty on the basis of a consumption or expenditure concept of family resources, 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 a 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 a 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) 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 may be 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.

Appendix Table B: 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, and shelter, plus a little bit more
1992 level (two-adult/two-child family)	$14,228	Suggest within 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 regions 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 (e.g. food stamps), minus income and payroll taxes and other nondiscretionary expenses (e.g., 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
Time 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 Table copied from Table 1-1, page 41: Connie F. Citro and Robert T. Michael (eds.), ***Measuring Poverty: A New Approach***, Washington, D. C.: National Academy Press, 1995

Appendix C: Describing the CE, CPS, and SIPP

I. Consumer Expenditure Survey

The CE survey 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 surveys each quarter. Consumer units are interviewed five times, at 3-month intervals for one 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 twenty percent of the sample are interviewed for the first time each quarter while twenty 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 Account, 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.[79]

II. 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

[79] U.S. Department of Labor (USDL), Bureau of Labor Statistics, ***Consumer Expenditure Survey, 1992-93***, Bulletin 2462, September 1995.

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.

III. 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 current design introduces a new sample panel each February. Each sample of households is interviewed every 4 months for 32 months. Most panels have eight panels. There are monthly rotation groups. 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.

IV. 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 four-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 D: Computing the Multipliers in Our Study

The expenditures for two basic bundles of commodities are computed, then the multipliers are applied to produce thresholds.

Basic Bundle 1 mimics the definition used in the Panel's report, with expenditures defined as in standard CE 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 paper 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.

I. 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 - B3 are computed for each vingtile using the micro data. These mean shares are then 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

<u>To compute the multiplier A1</u>
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));

To compute the multiplier A2
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: The multipliers will differ if they are estimated at the micro level versus the macro or aggregate level. We and 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.

II. 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 - B6 are computed for each vingtile. The mean shares are then used to estimate the multiplier by vingtile (see I. above).

Basic Bundle2 = 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

To compute the multiplier A4
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));

To compute the multiplier A5
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)).

Appendix E: 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	1.128
Metropolitan areas under 250,()00	1.128
Metropolitan areas 250,000-500,000	1.148
Metropolitan areas 500,000-1,000,000	1.141
Metropolitan areas 1,000,000 2.500,000	1.209
Metropolitan areas 2,500,000 or more	
Middle Atlantic (New Jersey, New York, Pennsylvania)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.908
Metropolitan areas 250,000-500,000	0.997
Metropolitan areas 500,000 1,000,000	1.020
Metropolitan areas 1,000,000-2,500,000	0.975
Metropolitan areas 2,500,000 or more	1.187
East North Central (Illinois, Indiana, Michigan Ohio, Wisconsin)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.896
Metropolitan areas 250,000-500,000	0.959
Metropolitan areas 500,000-1,000,000	0.987
Metropolitan areas 1,000,000-2,500,000	0.995
Metropolitan areas 2,500,000 or more	1.059
West North Central (Iowa Kansas, Minnesota Missouri Nebraska, North Dakota, South Dakota)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.861
Metropolitan areas 250,000-500,000	0.962
Metropolitan areas 500,()00-1,000,000	0.981
Metropolitan areas 1,000,000-2,500,000	1.028
Metropolitan areas 2,500,00() or more	NA
South Atlantic (Delaware, District of Columbia Florida Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.899
Metropolitan areas 250,000-500,000	0.961
Metropolitan areas 500,000-1,000,000	1.007
Metropolitan areas 1,000,0()0-2,500,000	1.043
Metropolitan areas 2,50(1,000 or more	1.119

Appendix E: 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] --continued:

East South Central (Alabama, Kentucky, Mississippi, Tennessee)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.827
Metropolitan areas 250,000-500,000	0.935
Metropolitan areas 500,000--1,000,000	0.947
Metropolitan areas 1,000,000-2,500,000	NA
Metropolitan areas 2,500,000 or more	NA
West South Central (Arkansas, Louisiana, Oklahoma, Texas)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.858
Metropolitan Areas 250,000-500,000	0.911
Metropolitan areas 500,000-1,000,000	0.942
Metropolitan areas 1,000,000-2,500,000	0.962
Metropolitan areas 2,500,0()0 or more	1.005
Mountain (Arizona, Colorado, Idaho, Montana, Nevada, ~ New Mexico, Utah, Wyoming)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.888
Metropolitan areas 250,000-500,000	0.976
Metropolitan areas 500,000-1,000,000	1.039
Metropolitan areas 1,000,000-2,500,000	1.003
Metropolitan areas 2,500,000 or more	NA
Pacific (Alaska, California, Hawaii, Oregon, Washington)	
Nonmetropolitan areas and Metropolitan areas under 250,000	0.969
Metropolitan areas 250,000 500,000	1.018
Metropolitan areas 500,000-1,000,000	1.028
Metropolitan areas 1,000,000-2,500,000	1.104
Metropolitan areas 2,500,000 or more	1.217

NOTE: Housing cost indexes calculated from 1990 census data on gross rent for two-bedroom apartments with specified characteristics; index values drawn from the 45th percentile of the gross rent distributions (see text).
N.A., Not applicable: no such areas in the region.
[1] Table copied from Table 5-3, pages 252-253: Connie F. Citro and Robert T. Michael (eds.), ***Measuring Poverty: A New Approach***, Washington, D. C.: National Academy Press, 1995

Table 1. Current and Alternative Equivalence Scales Expressed Relative to a Value of 1.00 for a Family of Two Adults and Two Children

Family Type	Implicit in Official Thresholds	0.65 Scale Economy Factor	0.70 Scale Economy Factor	0.75 Scale Economy Factor
Singles	0.513	0.451	0.425	0.399
Married couple	0.660	0.708	0.690	0.672
Plus one child	0.794	0.861	0.851	0.841
Plus two children	1.000	1.000	1.000	1.000
Plus three children	1.177	1.130	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

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 paper.

Table 2. A Comparison of the Published Expenditures, Replicated Expenditures and Expenditures Using Current Data *(Percentile Values of Expenditures on the Panel's Basic Bundle by Two-adult/two-child Families: Values from Table 2-6 of Panel Report and our replicated values, both using 1989-91 Consumer Expenditure Survey, in constant 1992 dollars, and 1992-94 data , in constant 1992 dollars)*

	Basic Bundle 1 Expenditures			Percent of Median		
Percentile	**1989-91 Table 2-6**	**1989-91 Replicated**	**1992-94**	**1989-91 Table 2-6**	**1989-91 Replicated**	**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

Basic Bundle 1=Food+Clothing+Shelter+Utilities
(See Appendix D for method used to calculate multipliers.)

Table 3. Multiplier of a Larger Bundle to a Smaller Bundle
(V*alues from Table 2-6 of NAS Report and our Replicated Values, Both using 1989-91 Consumer Expenditure Survey in constant 1992 dollars, and 1992-94 data converted to 1992 dollars*

	R1			R2		
	1989-91 Table 2-6	**1989-91 Replicated**	**1992-94**	**1989-91 Table 2-6**	**1989-91 Replicated**	**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	1.50	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

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
(See Appendix D for method used to calculate multipliers.)

Table 4. Official Poverty Thresholds* for Selected Family Type and Thresholds Based on Basic Bundles 1 and 2 (in current dollars for each year)**

Official Poverty Threshold	1990	1991	1992	1993	1994	1995
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***	1990	1991	1992	1993	1994	1995
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***	1990	1991	1992	1993	1994	1995
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

*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 $=(A+.7K)^{0.7}$

**Three years of CE data were updated using the CPI-U, e.g. 1989-91 CE data updated to 1992 dollars, to produce the thresholds for each year presented in the table.

***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 5A. Poverty Rates by Age: 1990 To 1995

	Thresholds*		
	Official	**Bundle 1**	**Bundle 2**
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
Age 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

*Official thresholds for each year used. Budget 1 and Budget 2 thresholds derived from calculation:
((1.15*mean of amount that is 78th 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 could the house be rented.

Table 5B. Poverty Rates by Race and Ethnicity: 1990 to 1995

	Thresholds*		
	Official	**Bundle 1**	**Bundle 2**
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**			
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

*Official thresholds for each year used. Budget 1 and Budget 2 thresholds derived from 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 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.
**May be of any race.

Table 5C. Poverty Rates by Work Experience and Family Type: 1990 to 1995

	Thresholds*		
	Official	**Bundle 1**	**Bundle 2**
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
Married Couple			
1990	6.9	12.2	15.3
1991	7.3	12.9	15.7
1992	*7.7*	*13.7*	*16.5*
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

*Official thresholds for each year used. Budget 1 and Budget 2 thresholds derived from 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 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 Various Characteristics: 1992

	Number (thousands)			Percent of the Poor		
	Thresholds*			Thresholds*		
	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	100.00	100.00	100.00
Children (under 18 years)	15,294	18,518	21,198	40.23	36.23	35.76
Age 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
NonHispanic	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	17,067	18,666	20,432	44.90	36.52	34.47
Worker	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

*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 could the house be rented.

Table 7A. Distribution of the Poverty Population by Selected Characteristics: 1992

	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
	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
Age 18 - 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
NonHispanic	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	17,067	18,666	18,623	19,316	20,432	20,089	20,467
Worker	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

*Official thresholds for 1992 used.

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.

Bundle 1 and Bundle 2 thresholds derived from 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 $=(A+.7K)^{0.7}$.

Multiplier A1 Thresholds derived from using multipliers of 1.21 and 1.19; Multiplier A2 Thresholds derived from using multipliers of 1.24 and 1.23. Multiplier A4 Thresholds derived from using multipliers of 1.19 and 1.17; Multiplier A5 Thresholds derived from using multipliers of 1.21 and 1.20.

Table 7B. Percentage Distribution of the Poverty Population by Selected Characteristics: 1992

	Thresholds						
	Official	**Bundle 1**	**Multiplier A1**	**Multiplier A2**	**Bundle 2**	**Multiplier A4**	**Multiplier A5**
Poverty Rate	14.8	19.9	19.9	21.0	23.1	22.4	23.2
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
Age 18 - 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
NonHispanic	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	44.9	36.5	36.6	35.9	34.5	34.9	34.4
Worker	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

*Official thresholds for 1992 used.

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.

Bundle 1 and Bundle 2 thresholds derived from 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 $=(A+.7K)^{0.7}$.

Multiplier A1 Thresholds derived from using multipliers of 1.21 and 1.19; Multiplier A2 Thresholds derived from using multipliers of 1.24 and 1.23. Multiplier A4 Thresholds derived from using multipliers of 1.19 and 1.17; Multiplier A5 Thresholds derived from using multipliers of 1.21 and 1.20.