

Experimental Poverty Measures

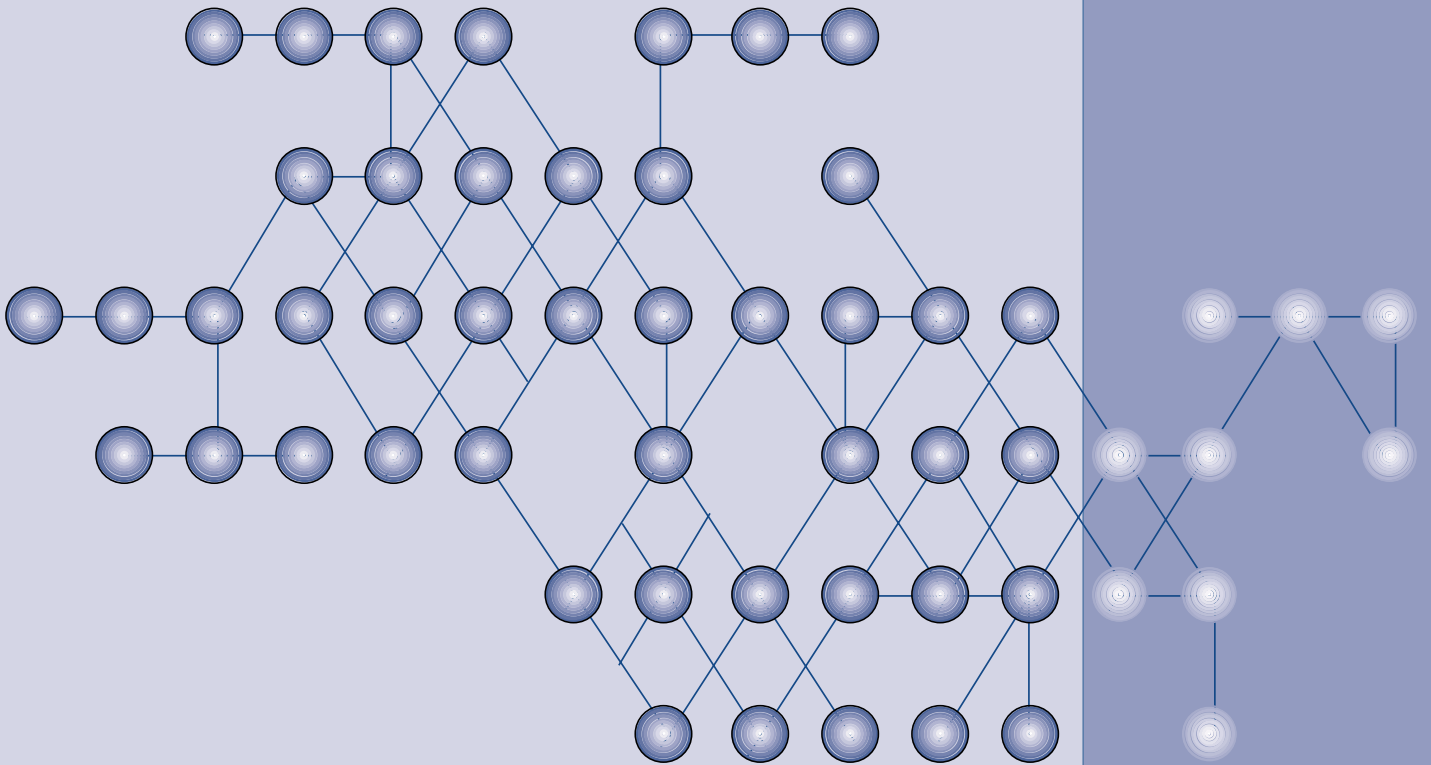
1990 to 1997

Issued June 1999

Current Population Reports
Consumer Income

P60-205

By Kathleen Short, Thesia Garner,
David Johnson, and Patricia Doyle



Demographic Programs

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ACKNOWLEDGMENTS

This report was prepared under the general direction of **Charles T. Nelson**, Assistant Division Chief for Income and Poverty Characteristics, Housing and Household Economic Statistics Division. Other important contributors were **Jessica Banthin** of the Agency for Health Care Policy Research, **Richard Bavier** of the Office of Management and Budget, and **Donald J. Hernandez, John Iceland,** and **Mary Naifeh** of the Census Bureau. **Bernadette Proctor** provided statistical assistance. **Cheryl Curtis** provided clerical assistance.

Special thanks are extended to **David Betson**, University of Notre Dame, **Constance F. Citro**, Committee on National Statistics of the National Academy of Sciences, **Robert T. Michael**, University of Chicago, **Denton Vaughan**, Social Security Administration, and **Katherine K. Wallman**, Office of Management and Budget, who chairs the Technical Working Group on Improving the Measurement of Income and Poverty, for reviewing and providing comments on this report. Additional thanks go to **Stephen Malpezzi** and **Barbara Wolfe** of the University of Wisconsin, and **Anthony Yezer** at George Washington University for their expertise and assistance.

Sampling review was conducted by **Alfred G. Meier** of the Demographic Statistical Methods Division. Data collection was conducted by Census Bureau field representatives under the overall direction of **Richard L. Bitzer**, Assistant Division Chief, Field Division.

The staff of the Administrative and Customer Services Division, **Walter C. Odom**, Chief, performed planning, design, composition, editorial review, and printing planning and procurement for publications, Internet products, and report forms. **Cynthia G. Brooks** provided publication coordination and editing.

Thesia Garner and **David Johnson** are in the Division of Price and Index Number Research, Bureau of Labor Statistics. **Patricia Rozaklis, Ralph Bradley, Raj Jain, Robert McClelland, Robert Bradford,** and **Steve Holden**, also of the Bureau of Labor Statistics, provided technical and computer programming assistance. **The findings presented here do not necessarily reflect the views of the Bureau of Labor Statistics.**

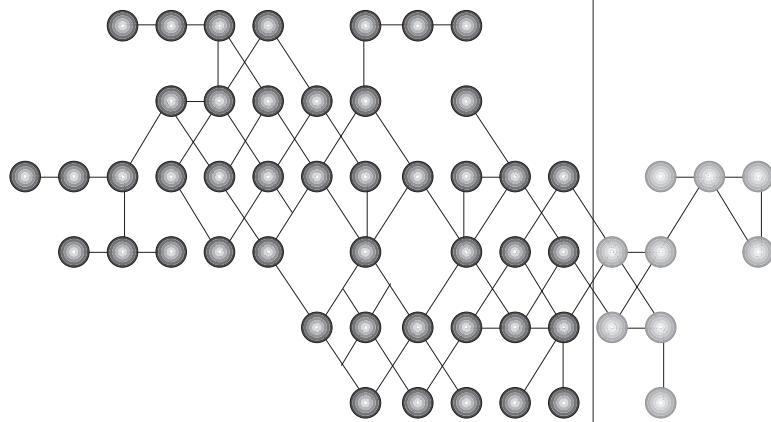
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SUGGESTED CITATION

Short, Kathleen, Thesia Garner, David Johnson, and Patricia Doyle, *Experimental Poverty Measures: 1990 to 1997*, U.S. Census Bureau, Current Population Reports, Consumer Income, P60-205, U.S. Government Printing Office, Washington, DC, 1999.



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Experimental Poverty Measures

I. EXECUTIVE SUMMARY

This report presents experimental measures of poverty in the United States. These measures are illustrative variations of the recommendations of the *Panel on Poverty and Family Assistance: Concepts, Information Needs, and Measurement Methods* of the National Research Council.¹ The experimental measures presented here:

- Incorporate, in a way that the official measure does not, the effects of key government policies aimed at the most needy families in the United States.
- Use an after-tax income measure.
- Add the value of in-kind benefits, such as food stamps, to income.
- Take account of variations in expenses that are necessary to hold a job or to obtain medical care.

Key Findings

- Considering all in-kind transfers together reduces the incidence of poverty substantially, even though the reductions from any single program are generally quite small.
- The increase in poverty rates when one accounts for necessary expenses can be substantial but depends on the method used to value those expenses.
- Because of the earned income credit, deducting taxes from income on balance reduces the percentage of people who are viewed as being poor.

Effect of Experimental Poverty Measures on Various Subgroups

To examine the effect of changing the poverty measure on the poverty rates of different population subgroups, we compute “standardized” poverty rates, which constrain the experimental poverty rate for all persons to match the official rate. Holding overall poverty rates constant in this way allows us to illustrate the differential incidence of poverty on different groups. When we do this, we find:

- The experimental measures result in lower standardized poverty rates for children and higher rates for the elderly compared to the official measure.

- Standardized poverty rates are lower for Blacks under the experimental measures than under the official measure.
- The experimental measures show lower standardized poverty rates for people in families with a female householder (no spouse present) than are shown under the official measure. On the other hand, married couples are slightly more likely to be poor under the experimental measures.
- The experimental measures that account for geographic differences in the cost of housing show higher standardized poverty rates for people in the Northeast and the West and also for people residing in suburban areas than poverty rates based on the official measure.
- People with disabilities are considerably less likely to be counted as poor under the experimental measures than they are under the official measure.

Time Series Estimates

We also compare standardized poverty rates from 1990 to 1997 to the official poverty measure over the same time period. We find:

- The experimental measures follow trends that are similar to the official measure over this period. This is true for all experimental measures shown here.
- Patterns over time are similar for all measures whether the thresholds are updated using expenditure data or using changes in prices from year to year. However, a slightly more pronounced decline in poverty rates from 1993 to 1997 is observed when thresholds based on expenditure data are used.

Data Issues and Future Research

- The NAS panel recommended that the Survey of Income and Program Participation should become the source of official income and poverty statistics. All the measures presented in this report are based on the Current Population Survey. Steps needed to make this change are described in Section V.
- Various elements of the alternative poverty measures presented in this report would benefit from additional methodological research and improved data sources. These issues are discussed in the final section of the report.

¹Citro, Constance F. and Robert T. Michael (eds.), *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

This report represents our first step toward improving the official measure of poverty. We invite comments from readers on any of the issues presented in this report. Please send your suggestions to Kathleen Short, Housing and Household Economic Statistics Division, U.S. Census Bureau, Washington, DC 20233-8500, or via electronic mail to kshort@census.gov.

II. OVERVIEW AND INTRODUCTION

At the request of Congress, the National Research Council of the National Academy of Sciences established the Panel on Poverty and Family Assistance to address increasing concerns about weaknesses in the current official poverty measure for the United States. The major conclusion of the panel was that the current measure needs to be revised because it no longer accurately portrays trends in economic poverty or differences among population groups and geographic areas of the country. Based on its evaluation of the limitations of the current measure, the panel recommended a new measure which, in its opinion, would better reflect far-reaching changes that have occurred during the past 30 years in the society, the economy, and in government policies.

This report presents estimates indicating the extent to which the official poverty rate would have been different in 1997 if each of a series of specific recommendations made by the panel were implemented, and for calendar years 1990-1997 if many of the recommendations were implemented simultaneously. The purpose of this report is to provide information for evaluating the implications of many of the panel's recommendations for a new poverty measure. We do this by showing the change in the poverty estimates relative to the current measure for each recommendation. In some cases, we show alternative methods for implementing specific recommendations. *This report contains no recommendations on which new approaches should be adopted.* However, in Section IV, we present alternative measures that follow closely the panel's recommendations. The experimental measures presented differ methodologically but not conceptually from the measure described in the panel's report.

A. The National Research Council Report and Recommendations

The current official poverty measure was developed in the early 1960s, and only a few minor changes have been implemented since it was first adopted in 1965. This measure consists of a set of thresholds for families of different sizes and compositions. These are compared to a resource measure to determine a family's poverty status. The thresholds were chosen to represent the cost of a minimum diet multiplied by three (to allow for expenditures on other goods and services). Family resources were defined as before-tax money income. Concerns about the adequacy of the measure have increased during the past

two decades, culminating in a Congressional appropriation for an independent scientific study of the concepts, measurement methods, and information needs for a poverty measure. In response, the Committee on National Statistics of the National Research Council of the National Academy of Sciences (NAS) established the Panel on Poverty and Family Assistance, which released its report titled *Measuring Poverty: A New Approach* in the spring of 1995. Based on its assessment of the weaknesses of the current poverty measure, the NAS panel members recommended a new measure that they suggest better reflects contemporary social and economic realities and government policy.

Weaknesses of the current measure. The NAS panel identified several major weaknesses of the current poverty measure, including the definitions of both thresholds and incomes (or resources), that have become more apparent and problematic during the past three decades.

- *The current income measure does not reflect the effects of key government policies that alter the disposable income available to families and, hence, their poverty status.* Examples include payroll taxes, which reduce disposable income, and in-kind public-benefit programs, such as the food stamps program, which free up resources to spend on nonfood items.
- *The current poverty thresholds do not adjust for rising income levels and standards of living that have occurred since 1965,* despite evidence suggesting that the trend in the income level commonly thought necessary to lift a family out of poverty follows the trend in overall consumer expenditures.
- *The current measure does not take into account variation in expenses that are necessary to hold a job and to earn income—expenses that reduce disposable income.* These expenses include transportation costs pertaining to work, and, perhaps more importantly, the increasing costs of child care for working families resulting from the increased labor force participation of mothers.
- *The current measure does not take into account variation in medical costs across population groups which are a function of differences in health status and insurance coverage.*
- *The current poverty thresholds use family size adjustments that are anomalous and do not take into account important changes in family situations,* including payments made for child support and increasing cohabitation among unmarried couples.
- *The current poverty thresholds do not adjust for geographic differences in the cost of living across the nation,* although there are significant variations in prices across geographic areas.

General recommendations. The NAS panel reviewed several alternative approaches to measuring poverty, each with merits and limitations, noting that any decision to

accept or reject a particular approach must involve judgment as well as scientific evidence.² The NAS panel did, however, recommend specific changes to the official poverty measure based on the best scientific evidence available, its best judgment, and the criteria that the resulting poverty measure should be acceptable and understandable to the public, statistically defensible, and feasible to implement. At the broadest level, the NAS panel recommended that the new poverty measure should consist of a set of poverty thresholds and a definition of family resources for comparison to the thresholds to determine who is in or out of poverty. The panel stressed that the definition of family income or resources should be consistent with the concept underlying the poverty threshold. They elaborated these recommendations by providing specific, detailed procedures for implementation, though often within a range, or by identifying research needed to provide the basis for decisions to fully implement the more general recommendations.

Threshold recommendations. The panel recommended that the thresholds should represent a dollar amount for food, clothing, shelter (including utilities), and a small additional amount to allow for other common, everyday needs (e.g., household supplies, personal care, and nonwork-related transportation). One threshold should be developed for a reference family type using Consumer Expenditure Survey data, and the reference family threshold should be adjusted to reflect the needs of different family types and geographic differences in the cost of living. The reference family should consist of two adults and two children. Adjustments to thresholds should be made over time to reflect changes in real growth in basic consumer expenditures.

Family resource recommendations. The panel recommended that family resources should be defined as the value of money income from all sources, plus the value of near-money benefits that are available to buy goods and services covered by the new thresholds, minus expenses that divert money that can no longer be used to buy these critical goods and services. Near-money benefits include nonmedical in-kind benefits, such as food stamps, subsidized housing, school lunches, and home energy assistance. Expenses to be subtracted include income taxes, social security payroll taxes, child care and other work-related expenses, child support payments to another household, and household contributions toward the costs of medical care and health insurance premiums (i.e., medical out-of-pocket costs or MOOP).

Data recommendations. Several of the panel's recommendations dealt with survey methodology. Most significantly, the panel recommended that the Survey of Income and

Program Participation (SIPP) should become the basis of official income and poverty statistics, replacing the March income supplement to the Current Population Survey (CPS). In this recommendation, the panel recognized that the SIPP asks more relevant questions than the March CPS and obtains income data of higher quality. The panel also encouraged a review of the Consumer Expenditure Survey (CEX) to improve the quality and usefulness of the data for poverty measurement. Finally, they recommended that consideration should be given to the practical problems of implementing fully an improved measure of poverty when using other surveys that do not collect the detailed information that is needed.

Research recommendations. There are several elements in the proposed poverty measure for which the panel recommended additional research. Among them are improved estimation of the geographic cost-of-living differences, an assessment of the extent of resource sharing among non-family household members for the purpose of broadening the unit of analysis, development of methods to value the benefits of owning a home and development of one or more medical care risk indexes (separate from the measure of economic poverty) that would measure the risk of having inadequate or no health insurance coverage.

B. Purpose and Plan of This Report

The purpose of this report is to provide information regarding the implications of many of the NAS panel recommendations. The report shows how estimated levels of poverty would differ from official levels as specific recommendations of the NAS panel are implemented individually and how estimated trends would differ when many recommendations are implemented simultaneously. Estimates are developed for calendar years 1990-1997 using data from the CPS, the CEX, and other sources. We address issues related to the development of poverty estimates using the SIPP in a later section on data issues and opportunities.

The following two sections of the report describe and implement particular approaches recommended by the NAS panel and provide a few illustrative variations of these recommendations. First, we present results showing how the official poverty estimates for 1997 would be affected by implementing various recommendations one or two at a time. This first section focuses, in turn, on recommendations pertaining to poverty thresholds, on family resources, on both thresholds and resources, and on various methods for updating the thresholds over time. Second, we present results showing the implications of simultaneously implementing several recommendations for the distribution of poverty among subgroups of the population in 1997 and for trends between 1990 and 1997. These estimates are "standardized"; that is, they are adjusted so that the overall experimental poverty rate is the same as the current official measure in 1997 (the latest year of available data).

²Citro and Michael, pp. xvi, xvii, and 3.

The NAS panel proposed changes to the poverty thresholds, the resource definition, family equivalence scales, and methods for updating the thresholds from year to year, but recognized that setting a poverty level is a separate matter. The panel members suggested a level that they regarded as reasonable; it was higher than the current level. This report does not advocate any particular poverty level, but takes a “standardized” approach to facilitate comparisons of alternatives.

Some recommendations could not be implemented here because necessary data (or model estimates) are not available from the March CPS. They include deducting child support payments from the disposable income of the payer³ and adding the value of benefits received under the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the School Breakfast Program to income. These suggestions will be investigated in the future using the SIPP, where data on these items are readily available.

The report closes with two sections, one that discusses data limitations and opportunities in major surveys for more completely implementing the NAS panel recommendations, and another that identifies directions for future research. The appendixes provide a more extensive set of empirical estimates reflecting the specific recommendations, as well as estimates showing results from implementing several recommendations simultaneously where the levels of poverty have not been adjusted to match the actual official rate in 1997. More detailed descriptions of the methods used to derive experimental poverty estimates are presented in Appendix C.⁴

III. EFFECTS OF THE NAS PANEL RECOMMENDATIONS ON POVERTY ESTIMATES

This section describes results from estimating the effect of modifications recommended by the NAS panel, one or two at a time, on the overall level of poverty and on the number of people classified as poor in 1997.⁵ Corresponding results for particular subgroups in the population are presented in Appendix A. The reader should note that results presented in this section regarding the effects of one or two specific recommendations cannot simply be summed to estimate the overall effect of implementing multiple recommendations. It is also important to note that the measures presented in this section do not achieve consistency between resources and thresholds. While this

analysis is informative and relevant to our understanding of the elements in a poverty measure, no measure in this section can be considered a technically sound measure of who is poor. These measures are presented to provide an incremental view of the effect of each recommended change.

A. Recommendations Pertaining to Thresholds

Thresholds based on Consumer Expenditure Survey data. The NAS panel recommended that poverty thresholds represent a budget for food, clothing, shelter (including utilities), and a small additional amount to allow for other common needs (such as household supplies, personal care, and nonwork-related transportation). A threshold for a reference family type should be developed using actual consumer expenditure data and updated annually to reflect changes in expenditures on food, clothing, and shelter over the previous 3 years or the most recent 3 years for which data are available. The reference family threshold should be adjusted to obtain additional thresholds that reflect the needs of different family types.

The NAS panel recommended, more specifically, that the reference family threshold be calculated by multiplying a “designated percentage” of median expenditures—money spent on food, clothing, and shelter and utilities (FCSU) for two-adult, two-child families—by another “designated multiplier” to account for other common needs. These other needs refer to such goods and services as household supplies, personal care items, and other items not explicitly measured in the amount for FCSU.

Based on its review of data from the Consumer Expenditure Survey, the NAS panel concluded that a reasonable range is between 78 percent and 83 percent for the “designated percentage” of the median FCSU expenditures and between 1.15 and 1.25 for the “designated multiplier.” These conclusions were based on an analysis of consumer expenditure data, consideration of the values of other thresholds (such as expert budgets, half-of-median relative thresholds, and a threshold derived from subjective survey questions about the poverty line), and the panel’s judgment.⁶

Figure 1 presents estimates of the poverty rates when this range of assumptions is used to produce the thresholds. The resource measure used here to determine poverty status is money income. The results are poverty estimates that range from 11.7 percent to 14.2 percent in 1997, compared with the official poverty rate of 13.3 percent. The first measure uses the high end of both recommended ranges, i.e., 83 percent of median FCSU and 1.25 as the multiplier for other needs. These calculations result in a poverty threshold for the reference family of \$17,160 for 1997. The last measure uses 78 percent of the median

³Citro and Michael, p. 244.

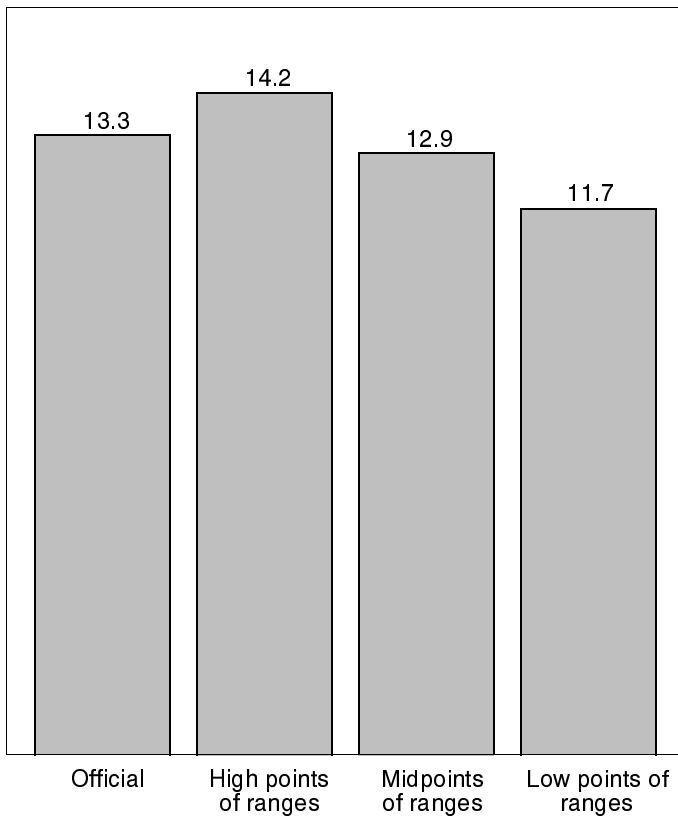
⁴The March CPS microdata files are available for independent research at <http://www.ferret.bls.census.gov/cgi-bin/ferret>. A poverty measurement research data file is available at <http://www.census.gov/ftp/pub/housing/povmeas/>.

⁵Unless noted otherwise, poverty status in this report is estimated only for those persons in the poverty universe, as traditionally defined. The poverty universe excludes inmates of institutions, Armed Forces members in barracks, and unrelated individuals under 15 years of age.

⁶Citro and Michael, pp. 6 and 146. Also, see pp. 54-57, 106, and 147-154.

Figure 1.
**Poverty Rates Using Experimental
 Thresholds: 1997**

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A1a.

and 1.15 as the multiplier, yielding a threshold of \$14,836. Using midpoints of the ranges yields a poverty threshold of \$15,998 for 1997. This compares with the official threshold for a two-adult, two-child family of \$16,276. The poverty rate based on using the midpoints of the ranges for the two multipliers is 12.9 percent, slightly under the 13.3 percent official poverty rate.

Because these thresholds, calculated for the two-adult, two-child family only, do not by themselves take account of different family sizes and composition, the results presented above are implemented using the equivalence scale implicit in the official thresholds to make these adjustments. The next section discusses various alternative approaches to equivalence scales.

Adjusting thresholds for family size and composition. Given an appropriate poverty threshold for a reference family of two adults and two children, the NAS panel recommended that adjustments should be made to reflect the needs of different family types, that is, families with different numbers of adults and/or children. The panel recommended that the reference threshold be adjusted by means of an “equivalence scale” to determine thresholds for other family types.

More specifically, the panel recommended a two-parameter equivalence scale. One parameter reflects that children under age 18 consume less on average than adults consume - 70 percent as much in the panel’s proposal. The other parameter reflects economies of scale available to larger families by adding a decreasing amount to the scale value for a single person for each additional family member. Although a four-person family may need approximately twice as much for food and clothing as a two-person family, other needs, such as housing and transportation, are not additive in the same way. Acknowledging that the choice of an equivalence scale cannot avoid arbitrariness, the panel suggested a range of 0.65 to 0.75 for the economies of scale parameter.

Reflecting the lack of scientific consensus on the most appropriate form for the equivalence scale, this report presents estimates showing the range recommended by the panel. They are supplemented with estimates based on a scale that treats children as though they consume as much as adults, and an alternative three-parameter scale. (See Appendix C for details.)

The NAS panel’s choice of a two-parameter scale was an attempt to be consistent with the cost-of-raising-children literature and to smooth out increases in the scale for larger family sizes. Recent research suggests an alternative three-parameter scale that might be more appropriate for childless families.⁷ This scale attempts to reconcile differences between singles and childless couples, single-parent and two-parent families, and the cost-of-raising-children literature.

The three-parameter scale shown here allows for the first child in a single-adult family to increase the scale more than the first child in a two-adult family. It also restricts the relationship between two-adult and one-adult families so that the scale for the two-adult family is 41 percent more than the scale for the single-adult family. This implies a ratio of economies of scale for these two groups that is in between those implied by the current official measure, 29 percent, and that of the panel’s lower bound, 57 percent, respectively.

Figure 2 shows that using the equivalence scales recommended by the panel and comparing those thresholds with money income yields poverty rates ranging from 12.3 percent to 13.4 percent. The figure illustrates the effect of varying the scale parameter and the adult equivalent parameter used in each calculation of the two-parameter scale. Using the midpoint of their recommended range for both parameter values, 0.70, produces a poverty rate of 12.7 percent, which is smaller than the 13.3 percent based on the current measure. The alternative three-parameter scale results in a poverty rate of 13.1 percent.

⁷Betson, 1996.

Adjusting thresholds for geographic differences in housing costs. Variations in housing costs can be significant across areas of the country and housing expenditures are a large component of the poverty budget. As a first and partial step to account for cost-of-living differences among geographic areas, the NAS panel recommended that the housing component of poverty thresholds be adjusted for geographic differences in the cost of housing. Available data from the 1990 decennial census, analyzed with a methodology developed by the Department of Housing and Urban Development (HUD) to estimate rents for comparable units in different localities, permit the development of adjustments for metropolitan areas that fall within several population size groups in each of the nine Census Bureau divisions of the country.

The NAS panel implemented a modified version of the HUD approach with 1990 census data to determine whether interarea housing cost index values could be developed that were reasonably similar to findings in the scientific literature. The panel concluded that this approach represents a modest step in a necessary direction but that limitations remain. The procedure takes account of geographic differences in housing costs, but not differences in other costs, and even for housing costs

it assigns index values to people in some areas that are in error.⁸ Because of limitations of the available data, the panel recommended additional research to determine a method for updating measures of housing costs more frequently than every 10 years.

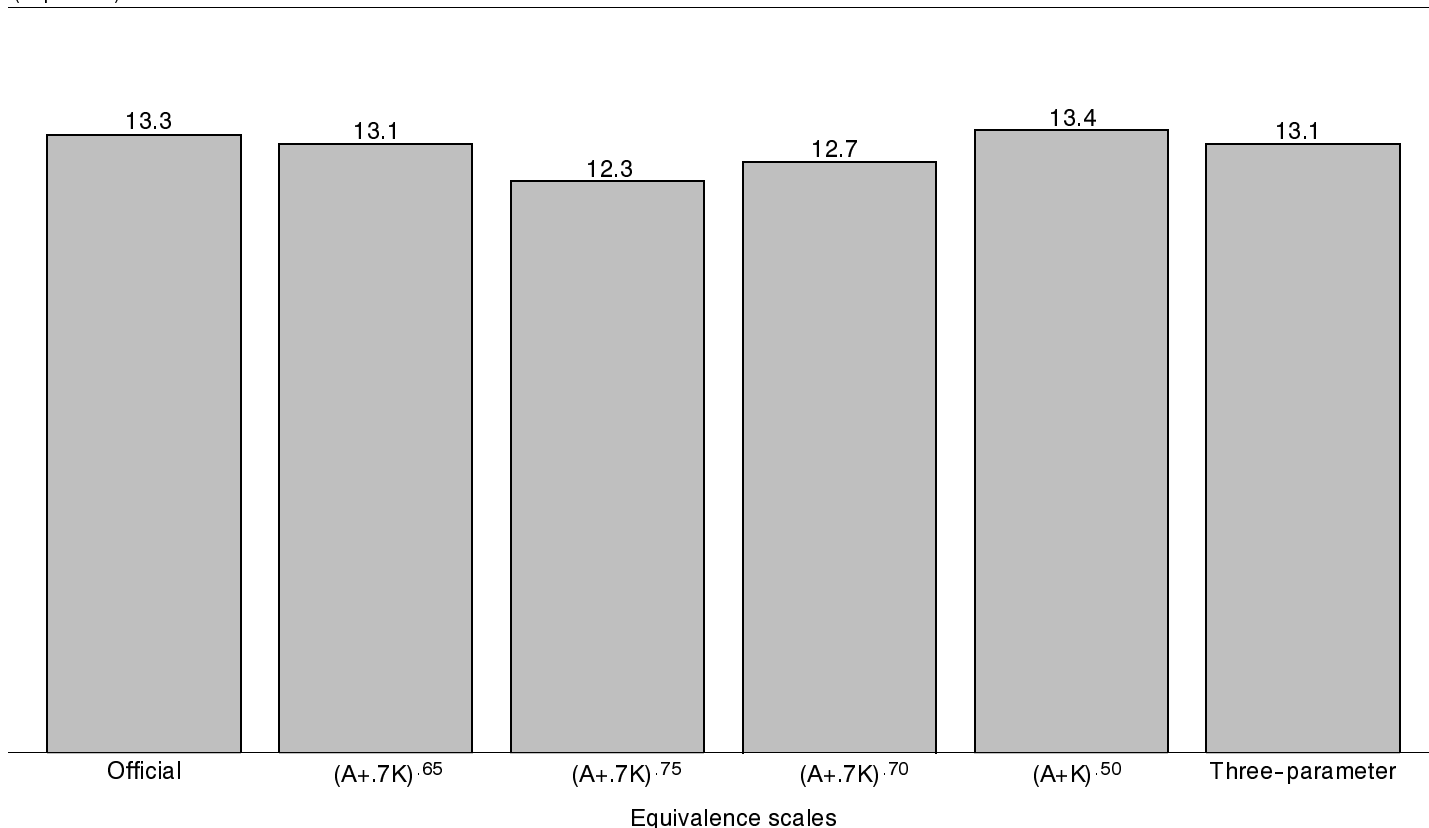
Figure 3 presents the results from implementing the panel's procedure for adjusting thresholds for geographic differences in the costs of housing using the current official thresholds (see Appendix C for details). Again, money income is used to compare to these thresholds to determine poverty status. As shown, this approach leads to a poverty rate of 13.0 percent in 1997, slightly lower than the official rate of 13.3 percent.

While overall rates are quite close, the important effect of the geographic adjustments is that there are fewer poor in areas with relatively low living costs and more in areas with relatively high living costs. Thus, standardized poverty rates estimated with these geographic adjustments are lower in the South and Midwest, where housing costs are lower, and higher in the Northeast and the West (see Appendix Table A3a for more details).

⁸Citro and Michael, p. 199.

Figure 2.
Poverty Rates Using Alternative Equivalence Scales: 1997

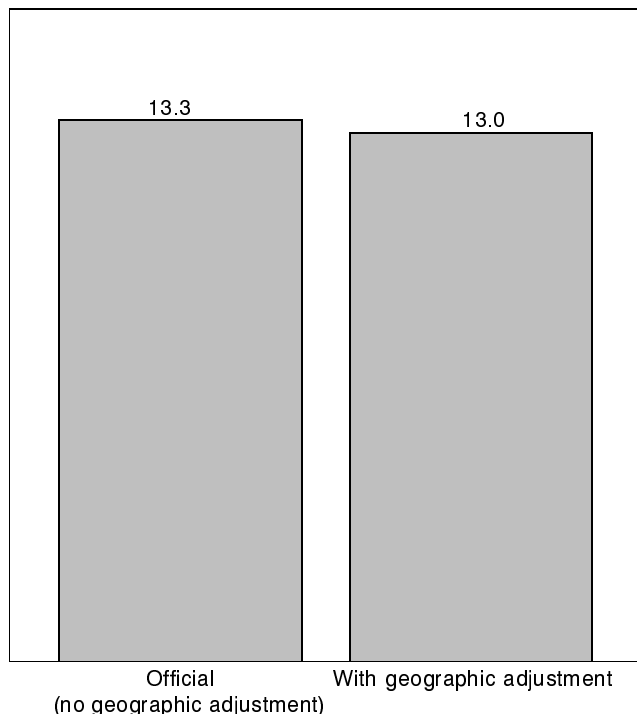
(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A2a.

Figure 3.
Poverty Rates With and Without a Geographic Adjustment: 1997

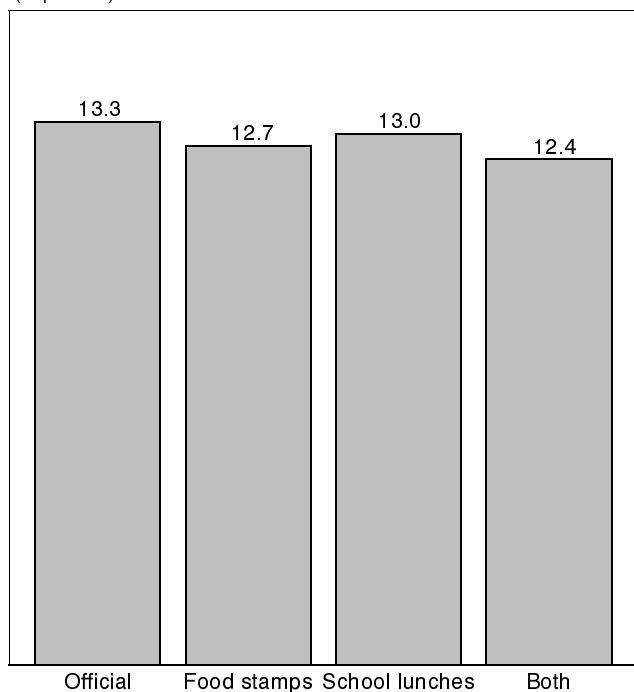
(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A3a.

Figure 4.
Poverty Rates Adding Food Stamp and School Lunch Subsidies to Resources: 1997

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A4a.

B. Recommendations Pertaining to Resources

Adjusting resources for food stamps and school lunch programs. To take account of the increase in family resources associated with receiving food stamps and subsidized school lunches, the NAS panel recommended that the value of these near-money benefits be added to money income in calculating resources available to the individual or family. Following the panel's recommendations for calculating available resources, estimates are derived by adding to reported cash income the face value of food stamps as reported in the CPS, and the subsidized value of school lunches for recipients as calculated by the U.S. Department of Agriculture⁹ (see Appendix C for details).

To show the effect on poverty estimates of these programs we add the value of these benefits to money income and compare the total to the official poverty thresholds. Figure 4 shows that adding the face value of food stamps to resources reduces the overall poverty rate in 1997 from 13.3 percent to 12.7 percent. Including only the subsidy for school lunches as a resource results in a poverty rate of 13.0 percent, while including both reduces the poverty rate to 12.4 percent.

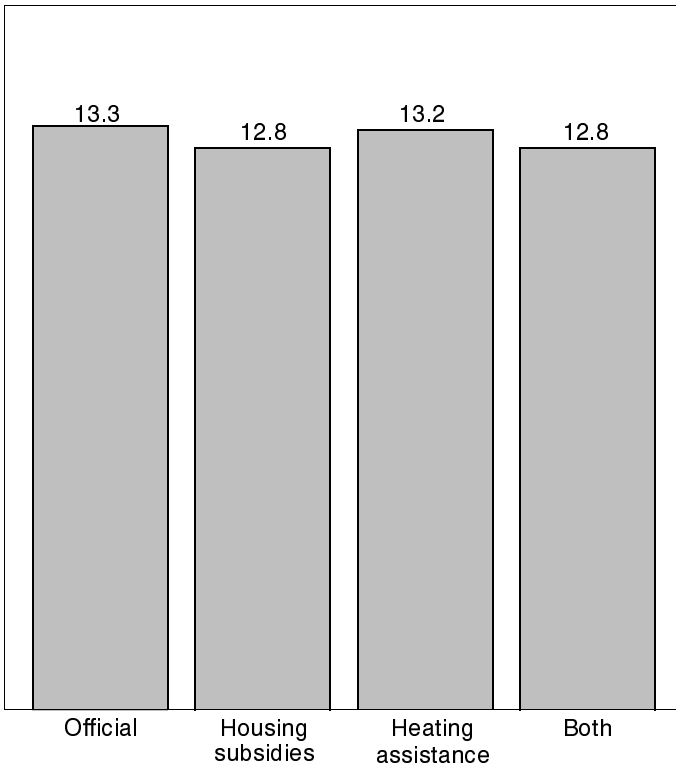
Adjusting resources for the value of housing subsidies and home energy assistance. Housing subsidies are significant additions to resources, and the NAS panel recommended that their value be included in the resource measure. Because the March CPS ascertains residence in such housing but not the values of rent paid or of rent subsidies, more complex procedures are necessary to estimate the value of these subsidies. While noting both the need for additional research to improve the accuracy of subsidy estimates and the virtues of using the SIPP for this purpose, the panel recommended as an interim approach the procedure developed by the U.S. Census Bureau using the 1985 American Housing Survey (AHS) updated to the current year using the Consumer Price Index (CPI) for residential rent (see Appendix C for details). As shown in Figure 5, using official thresholds and including this valuation of subsidies for housing in resources would reduce the overall poverty rate from 13.3 percent to 12.8 percent in 1997.

Home energy assistance is another means-tested government subsidy which the NAS panel recommended be included as a resource. These benefits are valued based on reports of home energy assistance received for heating during the six coldest months of the year (see Appendix C for details). The effect of including these benefits on the overall poverty rate in 1997 was quite small, resulting in a

⁹This amount includes not only a subsidy for free and reduced price meals but also a subsidy for regular priced school lunches.

Figure 5.
**Poverty Rates Adding Housing Subsidies
 and Heating Assistance to Resources: 1997**

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A5a.

poverty rate of 13.2 percent, as shown in Figure 5. Computing the combined effect of both programs results in a poverty rate that is not different from that of including housing subsidies only.

Adjusting resources for child care and other work-related expenses. For many families with children, child care costs must be paid if both parents are to earn labor market income. Regardless of whether they have children, workers usually must also pay the costs of commuting between home and work, and many have other work-related expenses (such as uniforms, union dues, licenses, permits, and tools). Because income that is used to pay such work-related expenses is not available for consumption, the NAS panel recommended that these costs be subtracted from income to calculate individual or family resources.

We implement three approaches to estimate child care expenses. The first approach closely follows the method used in the panel's report to subtract these costs from the income of families in which all resident parents work. The amount subtracted cannot exceed the earnings of the parent with lower earnings or a cap that is adjusted annually for inflation (whichever value is lower). Because the March

CPS does not ask about actual child care expenses, the panel offered an approach to impute whether a family incurred child care expenses and, if so, the amount spent using SIPP data (see Appendix C for details).

The second method for valuing child care costs imputes the incidence of child care expenses, as in the method above, but then subtracts a flat amount from resources based on earlier deduction guidelines from the Food Stamp program and the former Aid to Families With Dependent Children (AFDC) program for child care. In particular, these programs have permitted parents to deduct from countable income some out-of-pocket spending for child care deemed necessary for the parent to work or participate in training. We base child care valuations on these figures because these program deductions for child care are a clear normative statement of what the Federal government regarded as a ceiling on the cost that is necessary for employment. To take account of changing costs over time, we update them for inflation using the Consumer Price Index for all items (CPI-U).

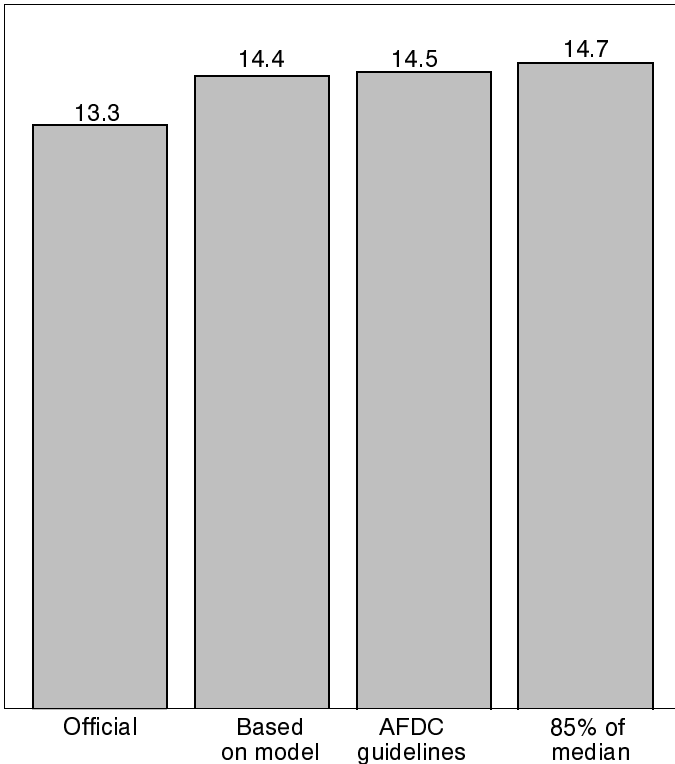
Imputing child care expenses only for some of the working families with dependent children, as is done in both methods described above, is somewhat problematic. Since no information about child care expenditures is available in the CPS, which families are assigned expenses is determined on the basis of a probability model in the first two methods described above (see Appendix C). The third approach for estimating child care expenses avoids this difficulty by subtracting a fixed amount from the income of all families with children and working parents. We implement this approach for parents with children who worked by subtracting from income a value representing 85 percent of the median cost of child care paid by families as reported in the SIPP (see Appendix C for details). This method follows the panel's method for valuing other work-related expenses described below.

Regarding other work-related expenses, the NAS panel recommended that for each working adult, following a similar argument as above, a flat amount (adjusted annually for inflation and not to exceed earnings) be subtracted from earnings to account for work-related transportation and miscellaneous expenses. In developing empirical estimates, the panel chose to subtract from earnings a value representing 85 percent of the median work-related expenses for all workers. We apply these procedures to estimate the effect on poverty of these other work-related expenditures individually, and in combination with child care expenses.

For families with child care expenses, the panel recommended that the total of child care costs plus other work-related expenses for the parent with the lower earnings should not exceed that parent's earnings. We implement this cap when estimating combined expenses using the model and the median child care methods, but not with the method using welfare deduction guidelines (see Appendix C for details).

Figure 6.
Poverty Rates Subtracting Alternative Valuations of Work-Related Expenses from Resources: 1997

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A6a.

As shown in Figure 6, subtracting child care and other work-related expenses from money income results in poverty rates ranging from 14.4 to 14.7 percent depending on which estimation method is used. Each measure shown here represents a different method of valuing child care costs. The first measure shown uses a model similar to that used by the panel, the second measure uses the child care deduction based on the AFDC program, and the third measure uses 85 percent of median expenses as measured in the SIPP. Other work-related expenses are valued the same in all three measures.

Including such expenses in a poverty measure affects the kinds of families who are classified as poor. As can be seen in Appendix Table A6, these calculations result in higher poverty rates for children and for people in families with one or more workers than we normally see under the official measure.

Adjusting resources for taxes. The payment of Federal and state income taxes and social security payroll taxes is mandatory. Such tax payments represent a cost of obtaining income, and hence are not available for consumption spending. The refundable Federal Earned Income Credit (EIC), however, increases income available for consumption spending. The NAS panel recommended that the

value of taxes be subtracted from income and the value of the EIC be added to income to obtain a more appropriate measure of available resources. Sales and property taxes do not, according to the panel, need to be subtracted from income, because they are counted as expenditures on the threshold side, as recommended by the panel.

Taxes paid and income received from the EIC are not directly measured in the CPS, and must be estimated using microsimulation models. The panel noted that the simulation of social security payroll taxes is quite straightforward, but the Census Bureau's current simulation model using the CPS to estimate other tax effects has important limitations. One important limitation is that simulated tax estimates assign values based on liability or eligibility rather than on actual taxes paid or credits received. Therefore, the effect of taxes on poverty estimates, as illustrated, may be overstated if actual taxes paid or earned income credits received are markedly lower than values assigned by the model. However, while urging the Census Bureau to continue its work to develop improved estimates using the SIPP, the panel highlighted the CPS tax model as providing the best currently available estimates.

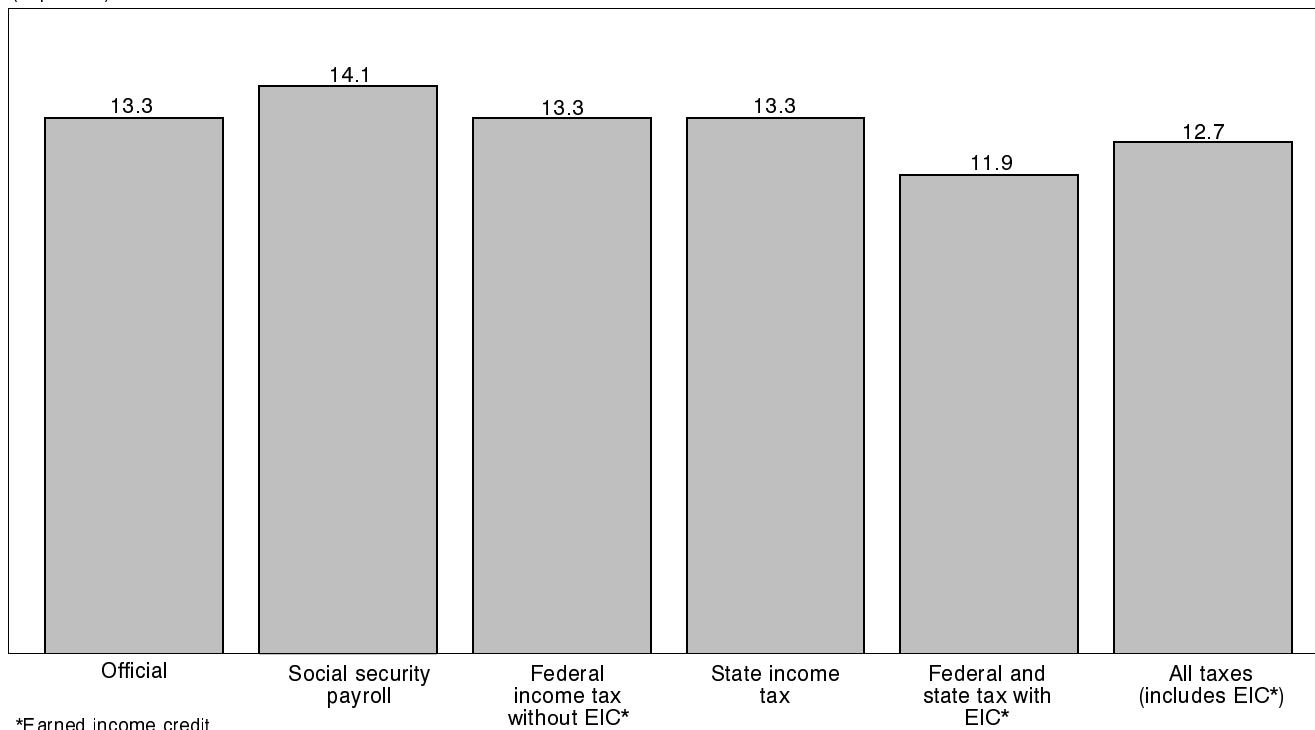
Figure 7 presents estimates of the effects of taxes and the EIC on the overall poverty rate in 1997 using the CPS tax models (see Appendix C for details). Taking account of Federal taxes, but excluding the role of the EIC, has virtually no effect on overall poverty; the rate is unchanged at 13.3 percent. This result follows because families with pre-tax income near the official poverty thresholds do not have significant Federal income tax liabilities. State income taxes by themselves have no overall effect on poverty, but the social security payroll tax (FICA) by itself leads to a higher poverty rate of 14.1 percent. Taking account of these taxes and the EIC, the poverty rate falls to 12.7 percent, because the increase in poverty rates resulting from the social security payroll tax is more than counterbalanced by the reduction that results from the EIC.

Using after-tax income rather than before-tax, as the current official measure does, alters estimates of poverty rates for different population subgroups. As shown in Appendix Table A7, accounting for taxes with the EIC has the effect of lowering poverty rates for such groups as children and for people in families with one or more workers.

Taking account of in-kind transfers combined, before and after taxes. We have shown the effect of different in-kind transfer programs individually on poverty estimates, and have seen that, generally, these effects are quite small. Often, however, people who are economically disadvantaged receive benefits from more than one program. The joint effect of all in-kind transfer programs on poverty estimates can be shown by combining together the value of benefits received from food stamps, school lunches, housing subsidies, and heating assistance together and recalculating poverty rates.

Figure 7.
Poverty Rates Taking Account of Taxes in Resources: 1997

(In percent)

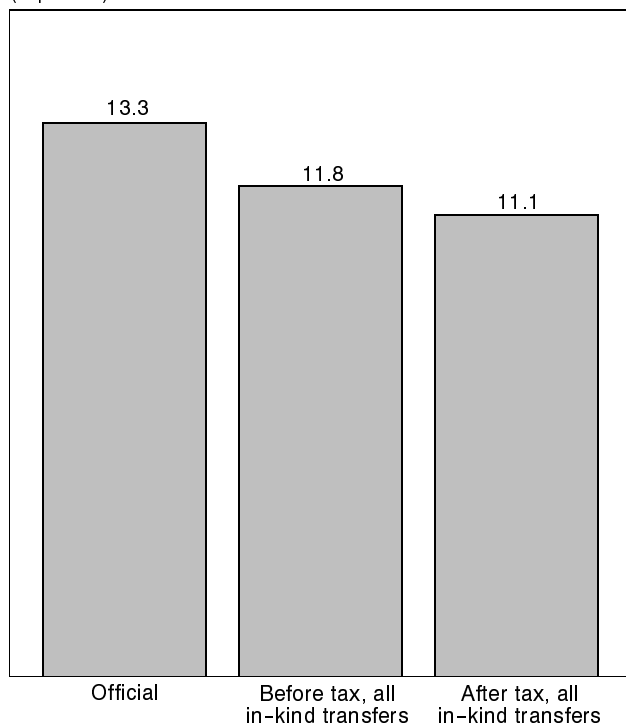


*Earned income credit.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A7a.

Figure 8.
Poverty Rates Including All In-Kind Transfers in Resources, Before and After Tax: 1997

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A8a.

As shown in Figure 8, including a value for all the in-kind transfers listed above and adding these to money income reduces poverty rates from 13.3 percent under the official measures to 11.8 percent. If we alternatively add these values to after-tax income in order to also capture the effect of the EIC, the overall poverty rate is additionally reduced to 11.1 percent for the year 1997, a decline of 2.2 percentage points.

C. Recommendations Pertaining to Thresholds and Resources

Taking account of medical care costs. Highlighting the enormous value of public and private health insurance coverage, the NAS panel concludes from a detailed evaluation of existing and proposed approaches that there is a fundamental problem with trying to combine nonmedical and medical care needs and resources in a poverty measure because the two components measure fundamentally different things.¹⁰ The nonmedical measure assesses, for the previous year, the actual ability of families and individuals to meet their needs for goods, such as food and housing; needs that are universal and cannot be deferred. The medical component, in contrast, measures a risk that may or may not actually materialize. Hence, someone in a

¹⁰Moon, 1993.

high-risk health category may have a good year and need only minimal medical care, but no one can have a year in which he or she does not need to eat. In recognition of this difference in nonmedical and medical needs, the NAS panel recommended the development of one or more distinct “medical care risk” indexes, but that such indexes should be kept separate from the measure of economic poverty. Work is proceeding at the Department of Health and Human Services to examine the possibility of developing such an index.¹¹

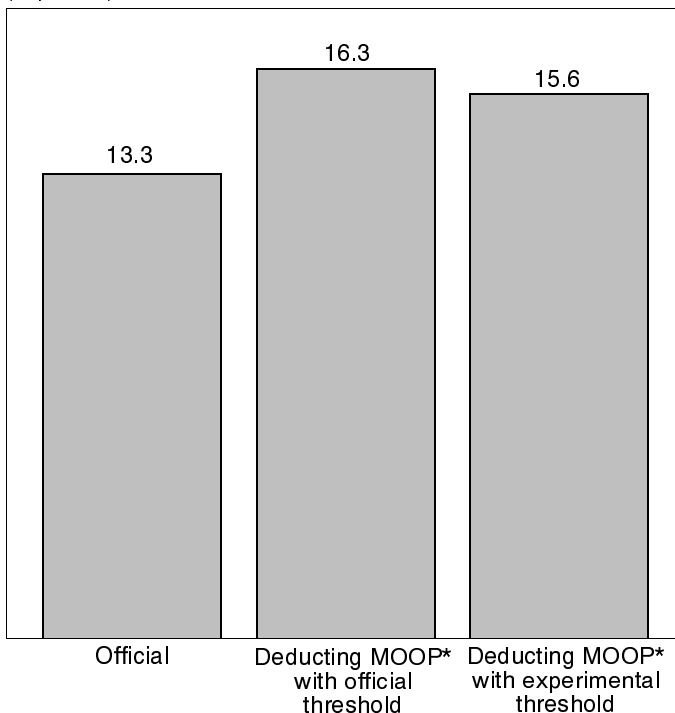
Noting that medical out-of-pocket (MOOP) expenses reduce disposable income, the NAS panel recommended that these expenses be subtracted from the family resource measure. This yields an economic poverty measure that is sensitive to changes in the health care financing system that increase (or reduce) disposable income and thereby reduce (or increase) economic poverty. The panel’s recommended measure excludes amounts spent on medical care from both sides of the comparison, i.e., the thresholds do not account for medical care needs, and resources are calculated net of expenditures on health care. For this reason, we show a measure which compares cash income minus MOOP with two different thresholds. The first measure uses the official threshold to show the incremental effect of subtracting MOOP from cash income. Figure 9 shows that this calculation yields a poverty rate of 16.3 percent, three percentage points above the official rate. The second measure shown compares income minus MOOP with the experimental thresholds that, by construction, do not include medical needs. Doing this, the procedure recommended by the NAS panel, leads to an overall poverty rate of 15.6 percent in 1997, compared to the official rate of 13.3 percent (see Figure 9.)

The panel’s recommendations on handling the need for medical care have inspired more debate than any other element in its report. Their recommendations also raised issues of implementation. Their treatment of medical needs would require surveys and administrative data sets either to ask families directly and extensively about out-of-pocket medical expenditures or, as was done for this report, to use statistical methods to assign amounts to each family. Their estimate of the impact of MOOP on poverty rates was relatively large, as is ours.¹²

The method that the panel used to value these expenses in a poverty measure using survey data such as the CPS is somewhat complex. Data from the 1987 National Medical Expenditure Survey (NMES) were used to develop a model that assigned the occurrence of such expenditures and the amount spent. Once these amounts were assigned to families then the aggregate amount

Figure 9.
**Poverty Rates Taking Account of
Medical Care: 1997**

(In percent)



*Medical out-of-pocket spending.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A9a.

assigned across all families is adjusted to match benchmarks developed from the Health Care Financing Administration’s National Health Accounts.¹³ This step introduces some inconsistency in a complete poverty measure in that no other element described so far in the construction of a poverty measure is adjusted to match independent aggregate estimates. Other elements in the panel’s proposed poverty measures suffer from nonsampling error, such as underreporting of benefits, but nevertheless are used unadjusted in the measures reported here, as they are in the official measure. The result of this inconsistent treatment may be an overstatement of the effect of MOOP on poverty rates (see Appendixes C and F for further discussion of these issues).

In light of both the conceptual and practical issues raised by the panel’s proposal for handling medical needs, an alternative treatment might be to include medical out-of-pocket expenses on both the threshold and resource sides, adding out-of-pocket needs to the thresholds and

¹¹See Doyle, 1997a and Short and Banthin, 1995.

¹²See Betson et al., 1997c. Other research (Doyle, 1997) has shown the marginal impact of MOOP to be less, though methods underlying these estimates differ.

¹³See Betson, 1995b.

leaving income to cover such expenses in resources.¹⁴ This treatment would parallel the panel's recommendations for poverty thresholds based on expenditures for food, clothing, shelter, and a little more, but adds amounts to those thresholds for out-of-pocket medical spending. The threshold for the reference family would include medical out-of-pocket spending as reported in the CEX along with spending on the basic bundle of food, clothing, shelter, and utilities. This threshold could be applied to different family types based on health care spending patterns as observed in the CEX or the NMES. This second method of accounting for medical needs would result in different threshold amounts based on size of family, age of family members, and health insurance coverage status.

The panel did not pursue this alternative because it would require a much larger number of thresholds to reflect different levels of medical care need.¹⁵ They argued that medical care needs differ from the need for food or housing in that not every family requires medical care in a given year, but when they do, the associated costs may be extraordinarily large. Assigning an average or median expenditure to incorporate medical care needs in the thresholds may overestimate the costs for many families and underestimate the cost for a few families. The panel concluded that it would be impossible to capture the actual variation of medical needs by variations in the thresholds and that this could lead to what the panel termed "erroneous poverty classification." For these reasons we use only the panel's recommended method in the experimental measures shown, but encourage additional research in this area.¹⁶

Adjusting for homeownership. For homeowners with high or no mortgage payments or other expenses, out-of-pocket shelter expenditures can differ substantially from those paid by renters. The NAS panel noted that this difference could be taken into account if a measure were developed indicating the amount that homeowners would pay if they were renting their homes.¹⁷ This measure, the estimated shelter costs for owner occupants, could replace

the owner's out-of-pocket expenditures on the threshold side (see Appendix C). To balance this, a measure of the implicit income of homeownership should be included in the incomes of homeowners to adjust for their advantaged situation regarding housing costs. The NAS panel used an out-of-pocket measure for "processing convenience," but their preferred approach would account for the cost of the flow of services for homeowners.¹⁸

The Census Bureau publishes annually a poverty measure that includes a measure of net return to home equity for homeowners. This value represents the hypothetical income that a household would receive if it chose to shift the amount held as home equity into an interest bearing account (see Appendix C for details). Although this measure provides a basis for illustrating the potential importance of developing and implementing a well-founded measure of imputed rent, it is not complete. It is not consistent with a threshold measure that only counts out-of-pocket expenses as reported in the CEX.

In order to prepare a more consistently defined measure, we substitute out-of-pocket shelter expenditures with estimated rental shelter costs for homeowners in the calculation of thresholds, and we add net return to home equity to resources (see Appendix C for details). This calculation brings consistency to our poverty measure because both sides account for the implicit costs and the implicit income of homeowners.

In addition to accounting for imputed shelter costs for homeowners, this method would also allow us to value the total cost of subsidized housing in our thresholds, rather than the out-of-pocket costs that would be counted without this imputation. This method of constructing the thresholds would also be consistent with the addition of housing subsidies received as income on the resource side, as shown earlier, because it would then reflect the total cost of housing that subsidized renters face. Without this imputation on the threshold side, it is inconsistent to add the value of housing subsidies to income. However, lacking additional research, we have not included this adjustment here.

Figure 10 shows that including an imputed rental shelter cost for homeowners in the thresholds and comparing to money income results in a poverty rate of 12.2 percent. Given that the estimated shelter costs for owner occupants with mortgages are lower than their out-of-pocket expenditures and that a sizable majority of reference families have mortgages, this is as expected (see Appendix C). Including the value of homeownership as income, by adding net return on home equity, reduces the overall poverty rate in 1997 from 13.3 percent to 12.1 percent.¹⁹ When these two pieces are combined so that the resource and

¹⁴See Bavier, 1998 and a summary of Marilyn Moon's proposal in Citro and Michael, p. 236.

¹⁵Citro and Michael, pp. 223-237.

¹⁶Another method to address medical care is to add health insurance benefits to income, as the Census Bureau does in its annual publication of alternative poverty statistics. This approach was not recommended by the panel and is the subject of some debate. To achieve consistency when we add a value for total insurance benefits to resources, we must add the value of total medical needs, not just out-of-pocket needs, into the thresholds. While there is not agreement on the degree of inclusion of medical needs in the original official thresholds, it is reasonable to state that the current thresholds do not reflect medical needs sufficiently, especially for the aged. Thus, adding insurance benefits to resources without adjusting thresholds is not appropriate. However, we show that adding the value of these insurance benefits to income reduces the poverty rate in 1997 from 13.3 percent to 12.0 percent (see Appendix C for details).

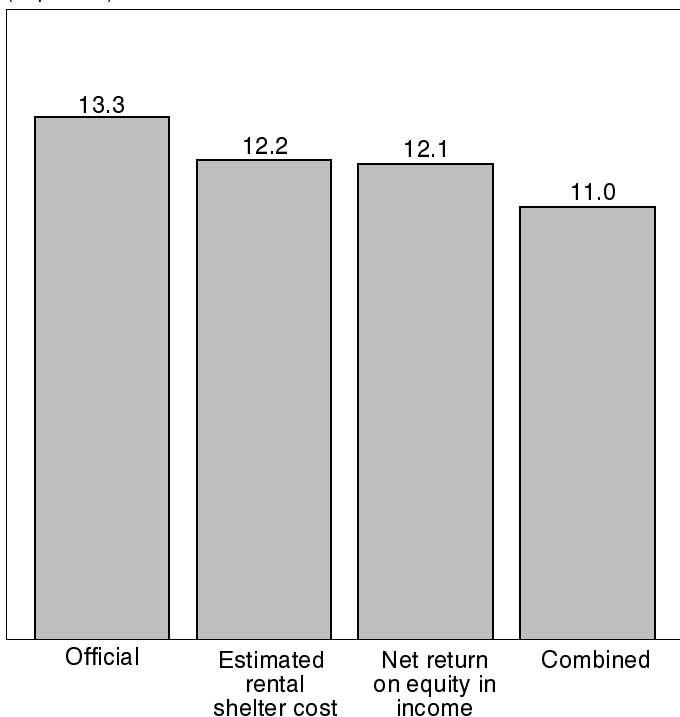
¹⁷The panel referred to this value as "imputed rent." This value would include expenditures for maintenance as well as rent.

¹⁸Citro and Michael, p. 148.

¹⁹This figure is not significantly different from the poverty rate of 12.2 percent that results from including an imputed rental shelter cost in the thresholds.

Figure 10.
**Poverty Rates Taking Account of
 Owner-Occupied Housing: 1997**

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A10a.

threshold measures are consistent, the resulting poverty rate is 11.0 percent. This method of accounting for homeownership, then, results in fewer people being classified as poor.

Changing the unit of analysis. The NAS panel recommended that the definition of “family” should be broadened for the purposes of poverty measurement to include cohabiting couples and that research should be conducted on the extent of resource sharing among roommates and other household and family members to determine if the definition of the unit of analysis should be modified further. This research, as recommended by the panel, should include an assessment of the effects on poverty rates of changing the unit of analysis by treating cohabiting couples as “families.”

The panel noted that insofar as cohabiting couples, roommates, and other household members benefit from economies of scale, the current measure overstates the poverty rate for such people. The panel also noted that cohabiting couples typically pool resources, and many exhibit considerable stability in their living arrangements, so that it makes sense to treat them like married-couple families for purposes of poverty measurement.

This report pursues the panel’s recommendations regarding the family definition used to measure poverty by implementing four new units of analysis. First, the

“cohabiting-couple unit of analysis” begins with the official unit of analysis — the primary family (the householder and any relatives of the householder) — but also includes in the unit of analysis the unmarried (cohabiting) partner and any children of the unmarried partner who are present in the home. Second, the “housemate-roommate unit of analysis” begins with the primary family but also includes any housemates, roommates, and foster children of the householder, and any children of these persons. Third, the “roomer-boarder unit of analysis” begins with the primary family but also includes any roomers and boarders in the home. Fourth, the “household unit of analysis” includes all persons in the household as a single unit (see Appendix C for details).

Poverty estimates computed based on these different units of analysis are shown in Figure 11. Broadening the unit of analysis by assuming that more and more people in a housing unit share resources results, not surprisingly, in lower poverty rates. The official poverty rate of 13.3 percent in 1997 would be 12.7 percent using the cohabiting-couple unit, 11.7 percent combining the cohabiting-couple and housemate-roommate units, and 11.5 percent using the household as the unit of analysis.

D. Updating Thresholds Over Time

The NAS panel recommended a procedure for annually updating the reference family threshold that would automatically, over time, reflect real changes in the consumption of basic goods and services. They argued that this procedure would avoid the need for periodic readjustments in the threshold level to account for real changes in basic consumption that would inevitably produce disruptions in the time series. The panel believed that this procedure represented a middle ground between the current approach of updating the thresholds only for price changes (inflation), and an approach to updating thresholds which tracks changes in total consumption. The panel’s intent was to update the thresholds in a “quasi-relative” manner that would change with changes in the real consumption of basic necessities.

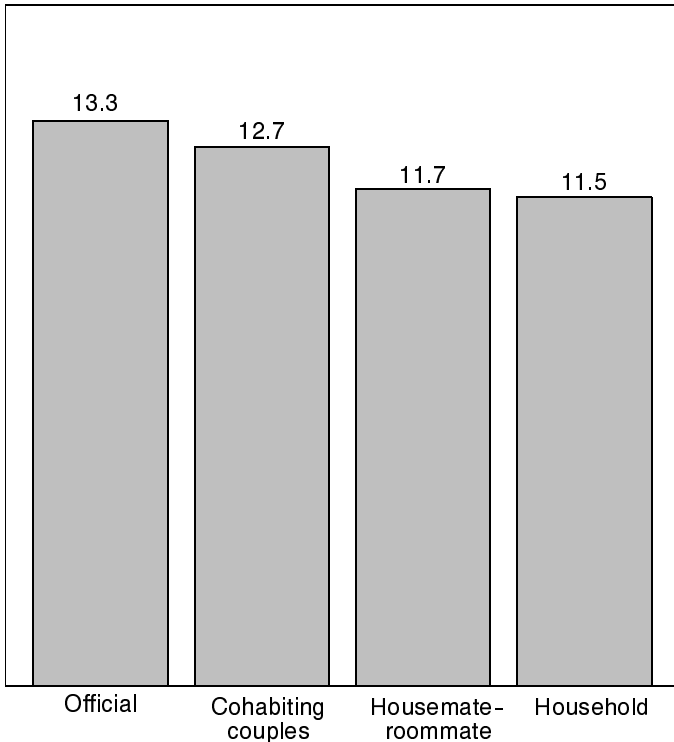
The panel recommended using the same procedure to calculate the initial thresholds for each subsequent year. Basically, this amounts to using the change in the median expenditures on the basic bundle composed of food, clothing, shelter, and utilities (FCSU) for the reference family in the CEX. The panel also recommended producing a second set of poverty rates using thresholds that are updated only for price changes.

The panel expected that the median expenditures on the basic bundle by the reference household would increase by more than the inflation rate but by less than the change in total consumption (as measured by per capita Personal Consumption Expenditures (PCE)²⁰). It was

²⁰U.S. Department of Commerce, Statistical Abstract of the United States, 1997, Table No. 685.

Figure 11.
**Poverty Rates Using Alternative
 Units of Analysis: 1997**

(In percent)



Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table A11a.

Table 1. **Percent Changes in Alternative Indexes for
 Updating the Thresholds for Three Time
 Periods**

Time period	Change in median FCSU	Change in CPI-U	Per capita PCE less medical care	Median after-tax income for family of four	Change using elasticity of 0.80
1961-1973	58.4	48.5	108.7	105.6	94.2
1973-1986	135.2	146.8	188.1	138.6	140.2
1986-1996	44.9	43.2	56.4	53.6	51.5

the median nominal after-tax income for a family of four, and the final column shows the changes based on using 80 percent of the changes in real median after-tax income for the family of four.

The table confirms the intuition of the panel for the first time period. Between 1961 and 1973, the median expenditures on the basic bundle increased more than the CPI-U but less than the per capita PCE. The table also shows that this relationship between the change in the median expenditures and change in the CPI-U does not hold for all time periods (see footnote about CPI-U-X1). It is also true that the year-to-year changes in the median expenditures are subject to substantial measurement error (due to the small CEX sample size) that causes these changes to be more volatile.

Table 1 also reflects that the increase in CPI-U adjusted thresholds (the official poverty thresholds) during the 1960s did not keep up with the increase in living levels and standards as given by the median after-tax income for a reference family of four. Although these procedures yield very different time trends between 1961-1973 because enormous increases occurred both in real consumption of basic goods and in real disposable income, they produce similar results for the period from 1973-1986, and yield nearly identical results for 1986-1996.

The table also presents another alternative updating method – an 80 percent share of the change in the real median after-tax income for the reference family of four. This alternative index is a more relative updating method and may more closely provide “an automatic mechanism for updating the thresholds on an annual basis for real changes in living standards.” How much the index responds to changes in the typical level of consumption (loosely reflected in median after-tax income) depends upon what one chooses for an elasticity parameter. This parameter would determine the responsiveness of the thresholds over time to changes in after-tax median family income. For example, those who believe that, over long periods of time, the evolution of minimum resource needs

thought that this method of updating would produce an elasticity with respect to total consumption of 0.65.²¹ That is, using the National Income and Product Accounts (NIPA) for PCE, the panel estimated that the cost of the basic bundle will rise at a rate of 65 percent of the increase in the cost of total consumption minus health care. The panel’s motivation came from the observation that the poverty threshold did not keep up with increases in median income since the 1960s.

Table 1 shows the percent changes in five alternative indexes for three time periods — 1961-73, 1973-86 and 1986-96.²² The first column shows the panel’s recommended method for updating the thresholds — the percent change in the median expenditures on the basic bundle for the reference family. The next column shows the current method for updating the official thresholds — the CPI-U.²³ The third column shows the percent change in a measure of total consumption — the per-capita PCE (less medical care). The fourth column shows the changes in

²¹Citro and Michael, pp. 154-157.

²²These time periods are chosen to reflect the collection of the CEX.

²³The new CPI-U definition, based on rental equivalency, was introduced in 1983. Prior to 1983, a comparable index is the CPI-U-X1. The CPI-U-X1 increased 45.2% in the 1961-1973 period and 132.2% in the 1973-1986 period.

is fully relative would argue for an elasticity parameter of 1.0, which would yield a 1 percent change in the thresholds for each percent change in the after-tax median income. Research based on the change in the views of the U.S. adult population regarding poverty level income over more than 40 years of the post World War II period, suggests that an elasticity of 0.80 would be appropriate.²⁴ By construction, this alternative index always lies in between the changes in the CPI and the changes in the nominal median income. As Table 1 shows, this alternate index results in relatively similar changes during the other periods and a much larger change in the thresholds during the 1961-73 period.

Following the panel's recommendation, in this report we produce a time-series of poverty rates using two sets of thresholds. One set is adjusted from year to year by the change in the median expenditures on FCSU and another set by changes in the CPI-U (see Table 2).

IV. COMBINING THE NAS PANEL RECOMMENDATIONS

In this section of the report we compute poverty measures that combine many of the elements shown in the previous section. Any alternative measure of poverty will combine most of these elements, but which combination of elements is a matter for additional consideration and broad policy discussion. In this section, we present several illustrations of the many possible combined measures. The measures that we present are only slightly different variations on the overall poverty measure described in the panel's report. While we have presented and discussed many alternatives in the previous section, several of these alternatives are the subject of ongoing research and are, therefore, not included here. The measures presented here are, for the most part, complete and consistent measures of poverty.

Table 2. **Experimental Thresholds Using Alternative Updating Methods: 1990-1997**

[Dollars. 1997 as base year]

Year	Current official threshold	FCSU backdated with change in median FCSU	FCSU 1997 backdated with CPI-U
1990	13,254	13,342	13,028
1991	13,812	13,843	13,576
1992	14,228	14,253	13,985
1993	14,654	14,791	14,403
1994	15,029	15,166	14,772
1995	15,455	15,545	15,191
1996	15,911	15,744	15,639
1997	16,276	15,998	15,998

²⁴See Vaughan, 1993 and Fisher, 1995.

The first experimental measure we show is referred to as the NAS measure. This is a measure that is calculated in a manner most similar to the measure described in the panel's report. While there are a few minor differences from the measure that the panel recommended, they are computational rather than conceptual in nature. More precisely, this measure is constructed in the following way:

Thresholds:

- Thresholds are set at the midpoints of the ranges recommended by the NAS panel - averaged over the three most recent years - i.e., data for 1995, 1996, and 1997 are averaged for the 1997 threshold.
- The equivalence scale is a two-parameter version.
- Geographic indexes are those listed in the panel report.

Resources:

- Include the value of food assistance programs.
- Include the value of housing subsidies.
- Include the value of energy assistance (only heating assistance).
- Subtract work-related and child care expenses using the panel's child care model.
- Take account of taxes as modeled in the CPS.
- Subtract medical out-of-pocket expenses (MOOP), modeled and calibrated to spending totals.

The second and third experimental measures that we report use a different method of valuing child care expenses, as described in Section III. These complete measures are referred to as DCM1 (Different Child Care Method 1) and DCM2 (Different Child Care Method 2). The second measure, DCM1, uses a percentage of median child care expenditures estimated from the SIPP and the third measure, DCM2, uses the amounts based on deductions for necessary child care in the AFDC and Food Stamp programs. The third measure, DCM2, which uses the welfare method of valuing child care, is similar to the panel's method in its effect on poverty estimates but is easier to implement (see Appendix C for details).

The fourth experimental measure we refer to as the DES-DCM2 measure. This measure is constructed like the DCM2, but, in addition to changing the child care computation, we also use a Different Equivalence Scale. For this measure we use the three-parameter equivalence scale described in Section III and AFDC allowances to value child care expenses. We include it here to show the effect of using a different equivalence scale in a complete poverty measure.

Finally we show the NAS and the DES-DCM2 measures without a geographic adjustment. These measures are referred to as the NGA and the DES-DCM2-NGA measures. These two measures are calculated exactly as the NAS and

the DES-DCM2 measures but the thresholds are not adjusted for differences in the cost of housing in different parts of the country. The geographic adjustment is excluded because, as the panel noted, this element requires more research and better data sources. This measure, then, reflects the assumption that the cost of meeting basic needs does not vary by geographic area.

Table 3 shows the poverty rates for all groups under the official measure and the experimental measures described above for the year 1997. As shown earlier, the effects of varying different elements in these combined measures are similar to the effects shown in Section III. For example, the child care method based on median estimates from SIPP yields a larger proportion of families facing these expenses and, thus, results in higher poverty rates. The geographic adjustment has the effect of lowering the poverty rate because relatively more officially poor people become reclassified as nonpoor in low-cost areas than nonpoor classified as poor in high-cost areas when it is implemented. All measures shown here use the family as the unit of analysis.

Table 3. Number of Poor and Poverty Rates of All Persons Using Alternative Measures: 1997

Measure	Number (1,000)	Rate (percent)
Official	35,574	13.3
NAS	41,224	15.4
DCM1 ^a	42,688	15.9
DCM2 ^b	41,460	15.4
DES-DCM2 ^c	43,232	16.1
NGA ^d	42,288	15.8
DES-DCM2-NGA ^e	44,270	16.5

^a Child care method based on SIPP medians.

^b Child care method based on AFDC program allowances.

^c Child care method based on AFDC program allowances and three-parameter equivalence scale.

^d NAS measure with no geographic adjustment.

^e Child care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

A. Poverty Rates by Selected Characteristics

The next series of figures show poverty rates calculated for various subgroups of the population for 1997 using the official measure and some of the experimental measures described above. In the charts we show only three of the alternative measures and the official measure for comparison. The three alternative measures shown are the NAS measure, the DES-DCM2 measure (with a different equivalence scale and child care expense valuation method), and the NGA measure (no geographic adjustments). Estimates for the other measures are in the tables in Appendix B. All of the general results discussed below apply similarly to those measures.

In this section, all alternative poverty measures are “standardized” to the official poverty rate for all persons (see Appendix B for unstandardized rates). To do this, all thresholds are adjusted by a factor, one for each measure,

in order to match the poverty rate of 13.3 percent for 1997.²⁵ These measures are shown this way in order to compare the differential incidence of poverty for these subgroups implied by the alternative combined measures. This method essentially holds constant the total poverty rate, so that these comparisons can be made.²⁶

As shown, the computation of different experimental poverty measures changes our perception of the incidence of poverty across the various subgroups listed there. For example, as shown in Figure 12, all of the experimental measures produce standardized poverty rates that are lower for children under 18 years of age and higher for the elderly (those over 65). In other words, under the alternative measures, children make up a smaller share of the poverty population while the elderly comprise a larger share. Standardized poverty rates for nonelderly adults are virtually unchanged by the experimental measures.

The experimental poverty measures also show differences in the incidence of poverty by other demographic characteristics such as race and ethnicity. As seen in Figure 13, standardized poverty rates are somewhat lower for Blacks using any of the experimental measures relative to the official measure. This result is due to the inclusion of in-kind benefits in the poverty measure and the relatively lower medical out-of-pocket expenses assigned to Blacks in the alternative measure.

For people of Hispanic origin, who may be of any race, poverty rates are similar across all the measures except that they are lower using the experimental measures with no geographic adjustment. This suggests that the additional elements in the experimental measure lower the poverty rates of Hispanics but that they tend to reside where housing costs are relatively high.

Figure 14 shows that people in families in which there are no workers have lower standardized poverty rates under the experimental measures. This result is due to the greater likelihood of receiving in-kind benefits and incurring no work-related expenses. This figure also shows that these experimental measures yield higher poverty rates for people in married-couple families and lower rates for those in female-householder families with no spouse present, than the rates under the official measure.

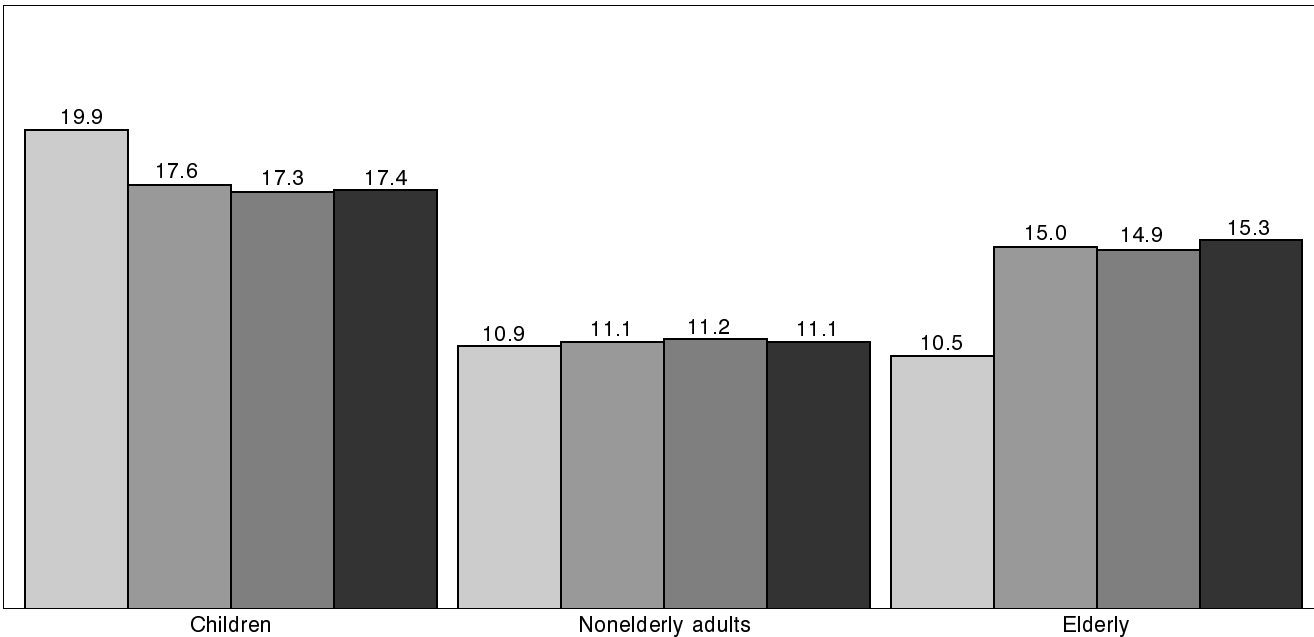
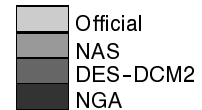
While the net effect of geographic adjustment on overall poverty rates is small across most demographic subgroups, these adjustments do affect regional measures of

²⁵The factors used are 0.91 for the NAS measure and the DCM2 measure, 0.90 for DCM1 and NGA measures, 0.89 for the DES-DCM2 measure and 0.88 for the DES-DCM2-NGA measures. The resulting thresholds have no intrinsic meaning as a reference family threshold. They should be interpreted as artifacts of the analysis employed here which include the effects of implementing all other proposed changes described in the text (Citro and Michael, p. 248).

²⁶While standardizing these rates helps us to compare between groups, it can slightly distort our interpretation of who is poor. If one group is more likely to have incomes near the poverty line, then adjusting the poverty thresholds in this way can differentially affect that group relative to others. See Johnson et al. (1998) for more details.

Figure 12.
**Standardized Poverty Rates by
 Age Group: 1997**

(In percent)

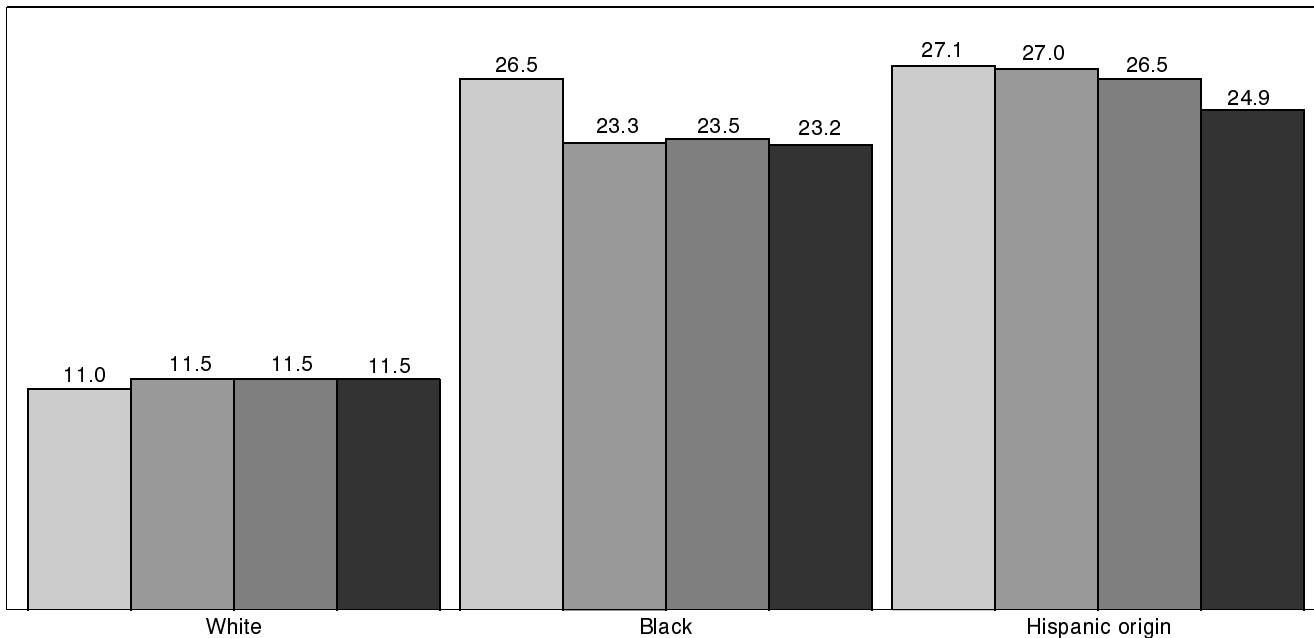
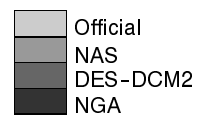


NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B1a.

Figure 13.
**Standardized Poverty Rates by Race and
 Ethnicity: 1997**

(In percent)



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B1a.

poverty. Figure 15 shows that the main effect of the geographic adjustments is to increase poverty rates in the Northeast and the West and to decrease standardized rates in the Midwest and the South. The next chart shows higher standardized rates in suburban areas, and lower rates in nonmetropolitan areas (shown in Figure 16). These results reflect the differential housing costs in these areas as constructed in the geographic indexes.

Figure 17 shows the same poverty measures for a more detailed list of age groups than we have shown earlier. Here we see that, overall, the experimental measures show lower standardized poverty rates than the official measure for children. This is primarily true for children over 6 years of age rather than for younger children. Nevertheless, these standardized rates still remain highest for small children than any other age group, even under the experimental measures. For the elderly, differences between the experimental measures and the official measure are generally more pronounced for those over 75 than for those aged 65 to 75 years of age.

With regard to detailed racial and ethnic categories, the experimental measures, with and without an adjustment for geography, show slightly higher poverty rates for White non-Hispanics than under the official measure (see Figure 18). As we have seen, standardized poverty rates for Hispanics are higher when the geographic adjustment

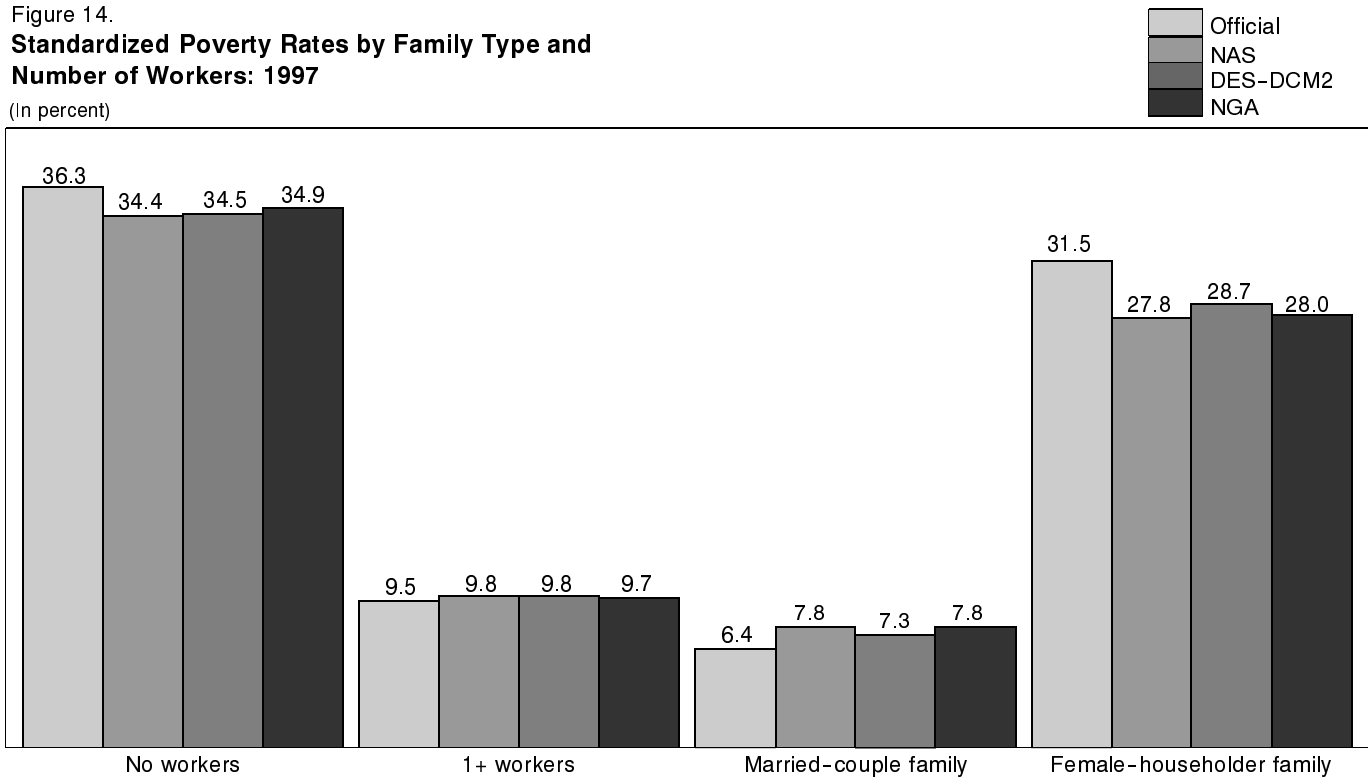
is included because many reside in the West where housing costs are higher. Poverty rates for Blacks, regardless of ethnicity, are lower under the experimental measures than under the official measure.

Poverty rates by family size reflect, among other things, the choice of equivalence scales. Most of the alternative measures shown here are adjusted using the two-parameter equivalence scale discussed earlier. Only the DES-DCM2 measure uses a different equivalence scale, in this case, the three-parameter scale discussed in Section III. These experimental measures all show higher poverty rates for families with two or three members than the official measure and lower poverty rates for all other family sizes. The effect of the different equivalence scales is most noticeable in the poverty rates for single people (see Figure 19). The measure using the three-parameter equivalence scale shows higher poverty rates for this group than the other measures yield. That scale also yields lower poverty rates for people in families of five or more members. Differences between the official and the experimental measures are greatest for the largest families.

Citizenship status is correlated with poverty status, with noncitizens having a higher probability of being poor than citizens under the official measures and the experimental measures. Under the experimental measures that adjust for geographic differences, poverty rates are higher

Figure 14.
Standardized Poverty Rates by Family Type and Number of Workers: 1997

(In percent)



NAS-National Academy of Sciences.

DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.

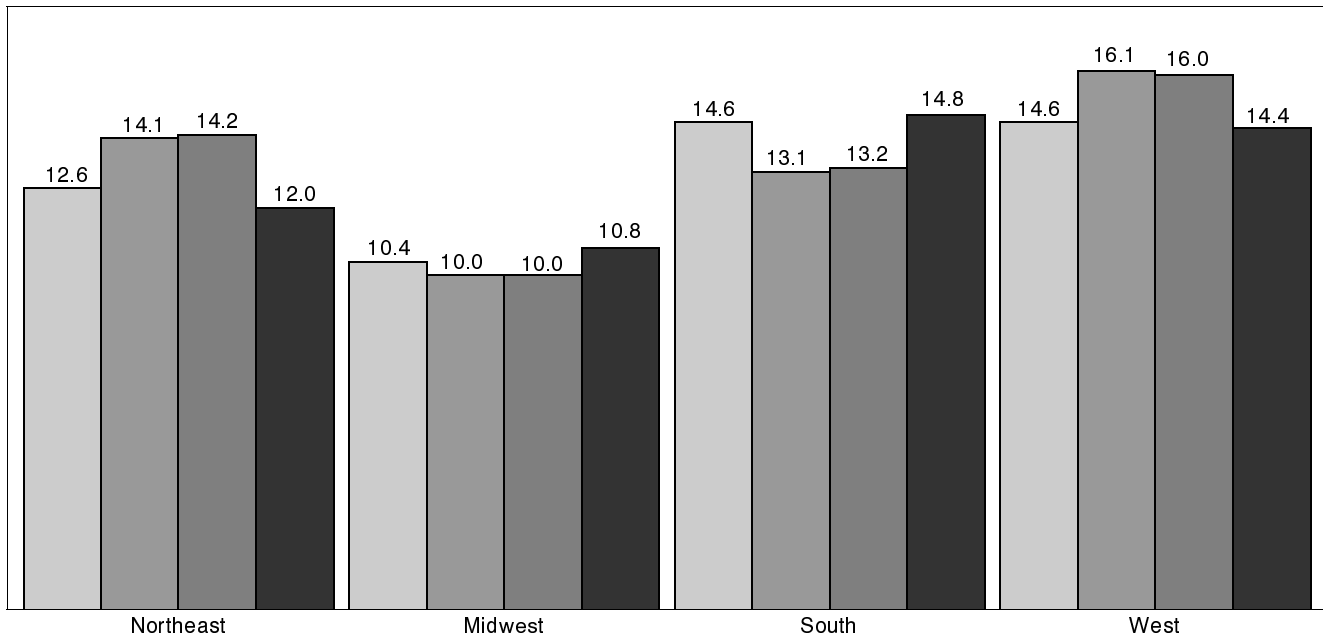
NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B1a.

Figure 15.
Standardized Poverty Rates by Region: 1997

Official
 NAS
 DES-DCM2
 NGA

(In percent)



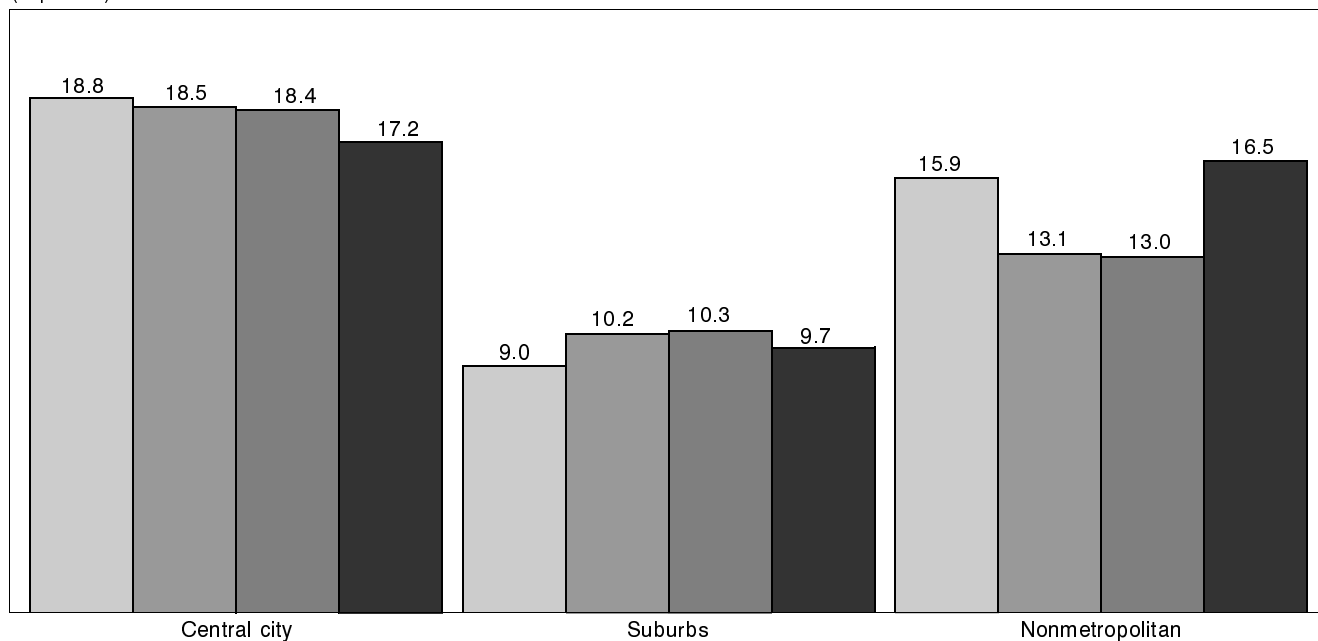
NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B1a.

Figure 16.
Standardized Poverty Rates by Residence: 1997

Official
 NAS
 DES-DCM2
 NGA

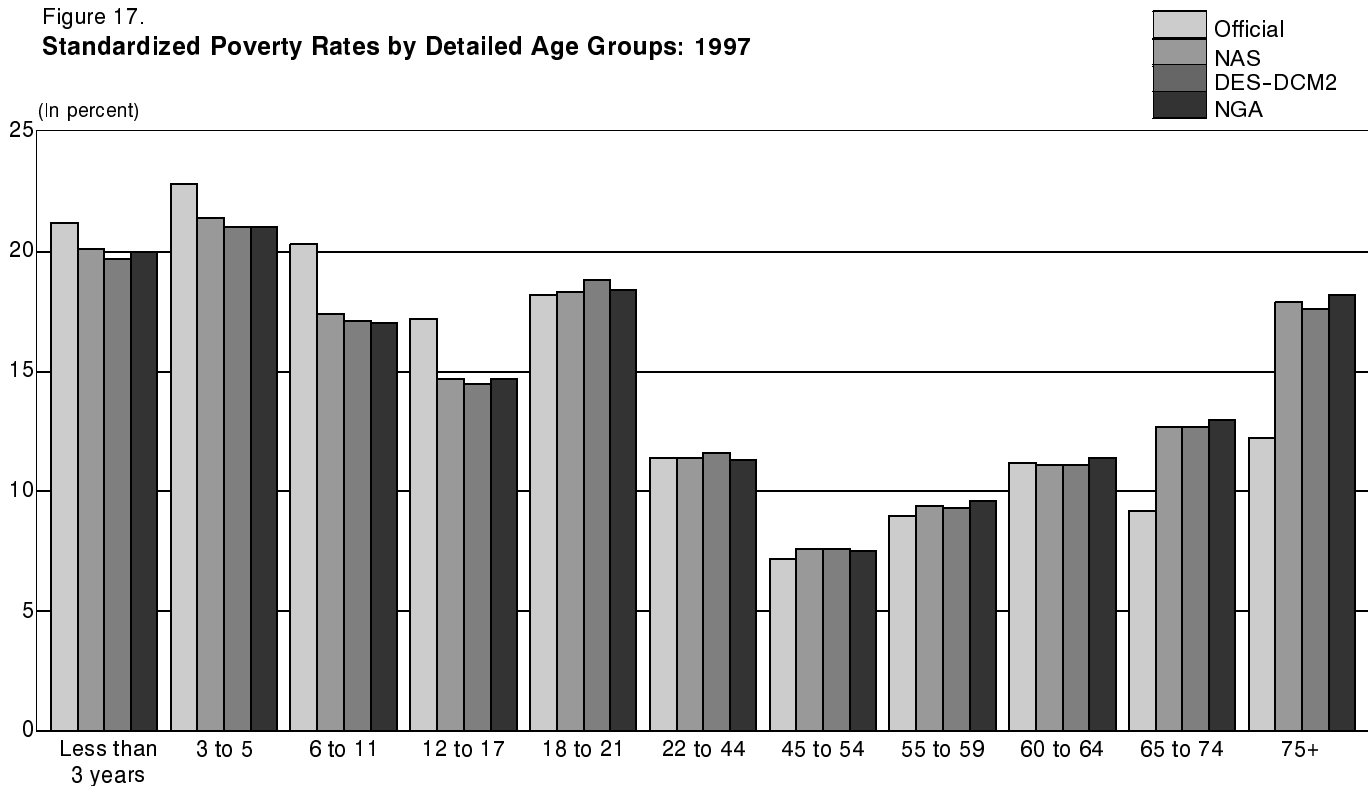
(In percent)



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B1a.

Figure 17.
Standardized Poverty Rates by Detailed Age Groups: 1997



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B3.

for both naturalized citizens and noncitizens than they are under the other measures that do not account for geographic differences (see Figure 20).

Finally, while poverty rates are higher for the disabled than the nondisabled under all measures, standardized poverty rates shown here are considerably lower for the work-disabled under the experimental measures than they are under the official measure.²⁷ In other words, the work-disabled, people with a health problem that prevents them from working, represent a smaller share of the poor under the alternative measures. This difference is primarily due to the lower nondiscretionary expenses, such as work-related expenses, attributed to the work-disabled poor under the experimental measures. It is important to note here that none of the methods discussed in Section III on valuing medical out-of-pocket expenses takes account of health or disability status. The average of MOOP expenses that are assigned to the poor disabled is slightly below that for all poor persons.

²⁷More specifically, a person is work-disabled if he or she meets any of the following criteria: 1) has health problems which prevent or limit work, 2) ever retired or left work for health reasons, 3) was not working because of long-term physical or mental illness, 4) did not work at all in previous year because of illness, 5) under age 65 and covered by medicare, 6) under age 65 and a recipient of SSI, or 7) received veteran's disability compensation.

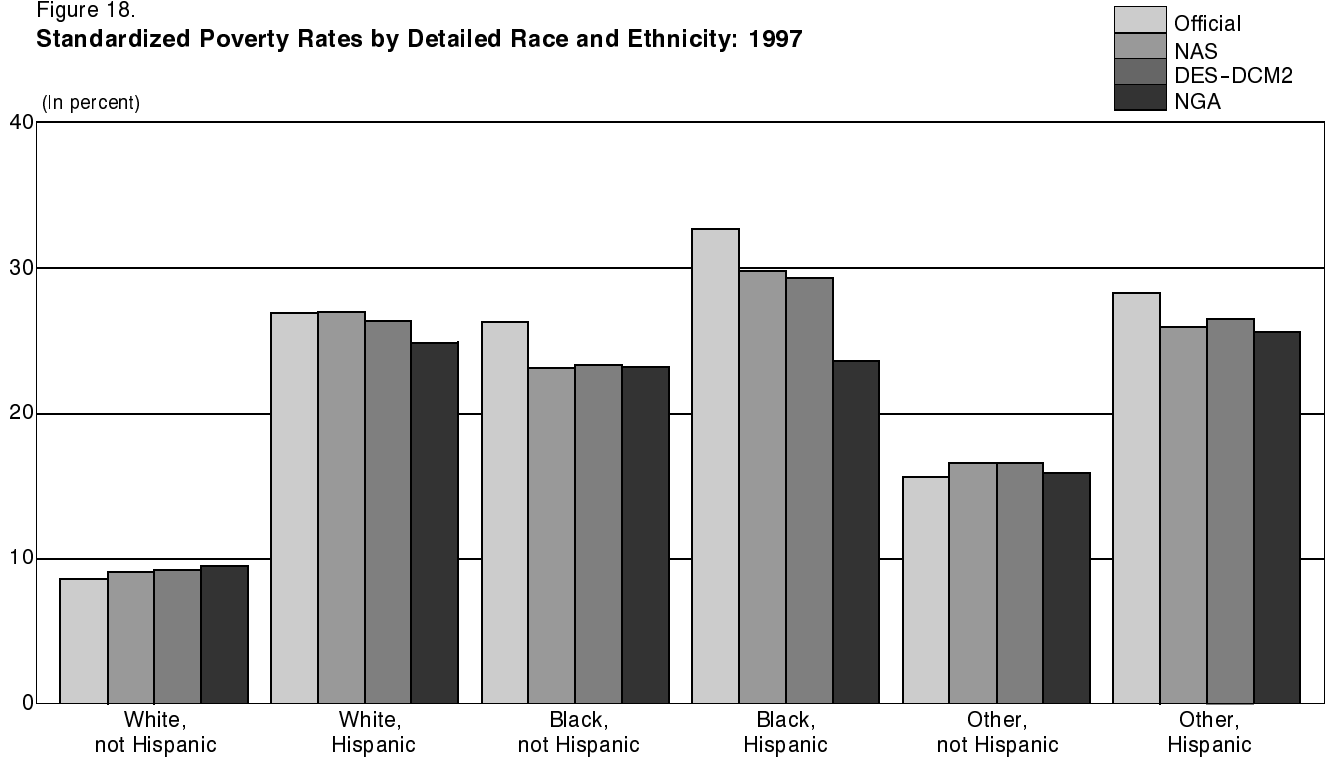
B. Experimental Poverty Estimates Over Time

Thus far, we have seen how the experimental measures differ from the current official measure for a given calendar year, 1997, and for different subgroups of the population. Now we examine how these measures behave over time relative to the official measure. To do this we construct two separate time series. The first one uses 3-year averages from the CEX to estimate thresholds for each year from 1990 to 1997. The second series uses the same threshold as the first for the year 1997, but then backcasts to generate a new set of thresholds based only on changes in the CPI-U between years. Both sets of thresholds are shown in Table 2 of section III for the reference two-adult, two-child family.

Again, we examine only "standardized" poverty rates.²⁸ For these standardized measures, the experimental poverty thresholds are adjusted to produce the same rate as the official rate for 1997. Thresholds for the other years in the series are adjusted by that same factor. They do not necessarily match the official rate in those earlier years.

²⁸Poverty rates that are not standardized are shown in the appendix tables.

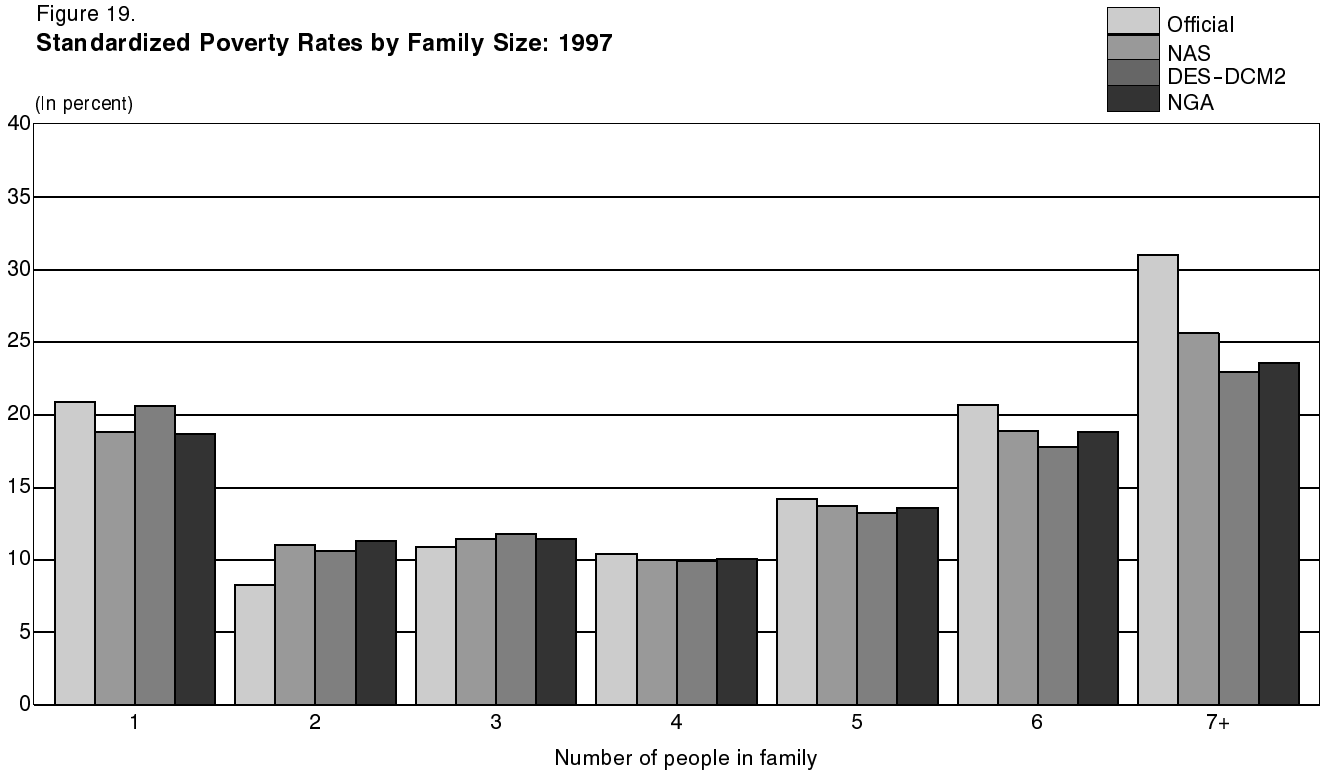
Figure 18.
Standardized Poverty Rates by Detailed Race and Ethnicity: 1997



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B3.

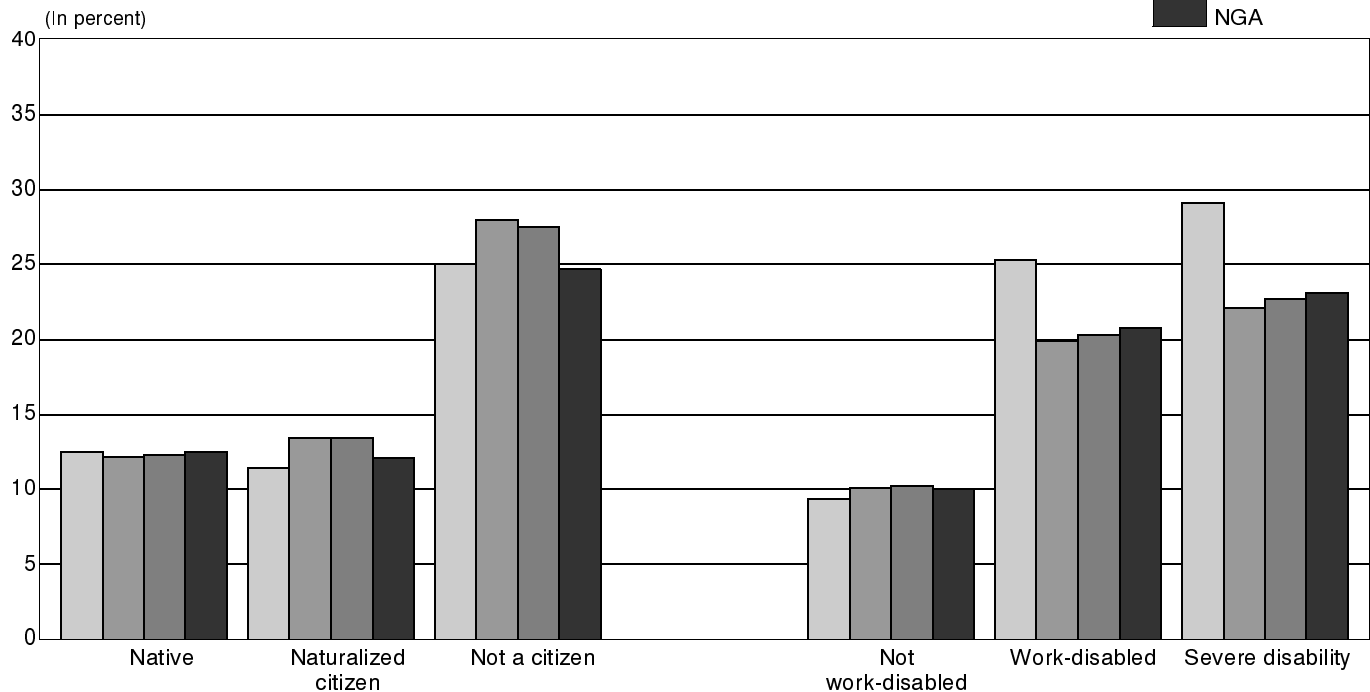
Figure 19.
Standardized Poverty Rates by Family Size: 1997



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B3.

Figure 20.
Standardized Poverty Rates by Citizenship and Work Disability: 1997



NAS—National Academy of Sciences.
 DES-DCM2—Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA—NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B3.

This approach allows us to examine trends in the rates while essentially holding the initial level constant.²⁹

Figure 21 shows three of these standardized poverty rates using thresholds updated with CEX data. The figure shows that, over the 1990-97 period, rates under the official and experimental measures behave similarly: increasing over the 1990-93 period and decreasing over the 1993-97 period. The official rate rose from 13.5 percent to 15.1 percent from 1990 to 1993 and fell to 13.3 percent by 1997 (not significantly different from 1990). All of the standardized experimental rates show similar patterns with only some slight differences.

In 1990, the experimental measures are higher than the official measure. The increase in poverty rates from 1990 to 1993, however, is similar across all the measures. All of the experimental rates, while constrained to be equal in 1997, are higher than the official rate in 1993, suggesting that these measures declined at a faster rate over this period than the official measure. One important reason for the accelerated decline in the experimental poverty rates

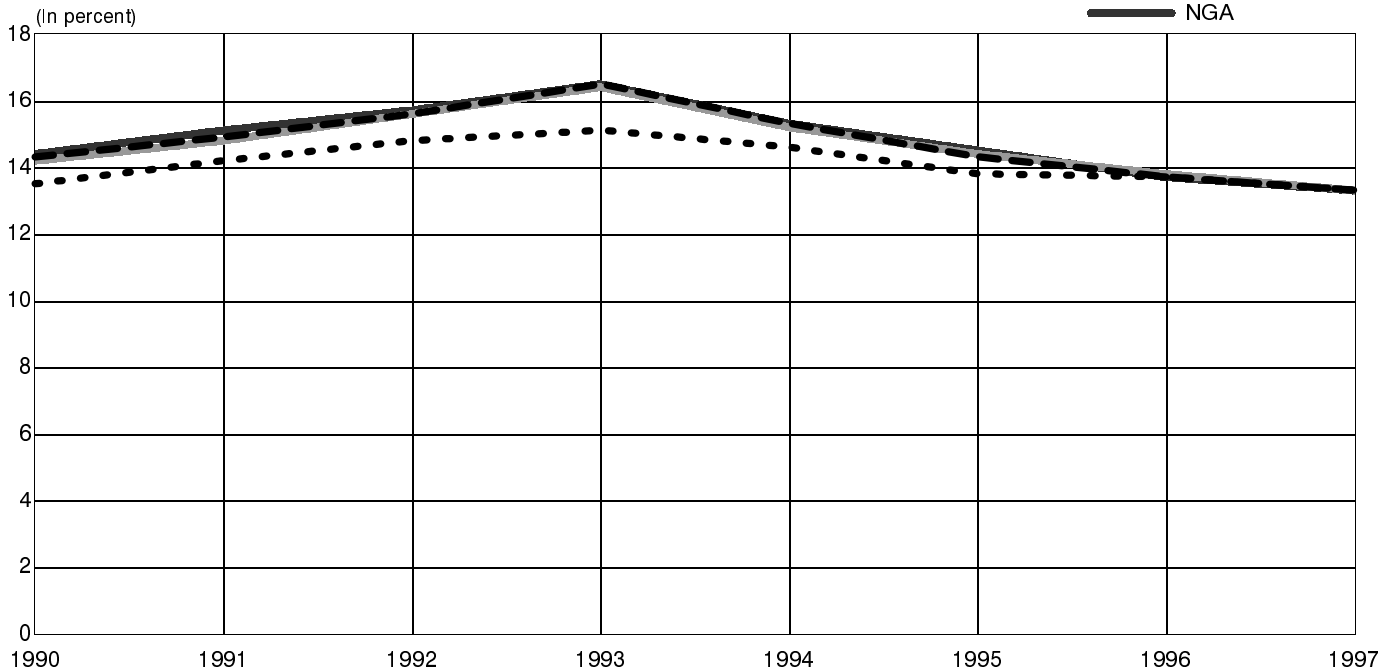
²⁹As noted earlier, see Johnson et al., 1998, for an explanation of the possible problems associated with this approach.

in this later period was the effect of an expanded EIC, a program that is not accounted for in the official poverty measure.

Differences in trends in poverty rates are also partly explained by the different trends in the thresholds (see Table 2 for the thresholds). Between 1990 and 1993, the official thresholds and the experimental FCSU thresholds increased by a similar percentage, about 11 percent. From 1993 to 1997, the experimental thresholds updated using the CEX increased at a lower rate than the official thresholds, 8 percent as opposed to 11 percent.

Figure 22 shows trends based on varying the thresholds from year to year with changes in the CPI-U only. Here we see that the trends of the measures are not statistically significantly different from that of the official measure. Figure 23 shows the difference between the two updating methods more clearly. Looking only at the NAS measure using the two updating methods shows that both measures follow a similar trend over the period. While the measure updated with the CEX is above the measure updated for price changes over this time period, increases from 1990 to 1993 and decreases in poverty rates from 1993 to 1996 are not statistically different using the two measures.

Figure 21.
**Standardized Poverty Rates With CEX-Based
 Thresholds: 1990 - 1997**



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B5.

V. DATA ISSUES AND OPPORTUNITIES

We have shown a variety of elements that could be included in an improved measure of poverty. We have also shown combinations of most of these elements to illustrate alternative poverty measures. This section discusses the strengths and limitations of key data sets for implementing an alternative poverty measure, and the opportunities for a more complete implementation of the NAS panel's recommendations in view of current and possible future data collection.

A. Survey of Income and Program Participation (SIPP)

A primary recommendation of the NAS panel was to make the SIPP rather than the CPS the official source for measuring income or resources in our poverty statistics. The panel made this recommendation because SIPP collects more information than the CPS that is relevant to the measurement of poverty. SIPP is an income survey rather than a supplement to a labor force survey and is, therefore, better able to satisfy the data requirements for an improved measure of poverty.

The SIPP is a continuing panel survey, begun in late 1983, in which all respondent household members are followed even if they move. SIPP is sponsored and conducted

by the Census Bureau. Until 1993, the design introduced a new sample panel each February. Beginning in 1996, an enlarged 4-year panel was introduced, with no further panels planned until 2000. 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 historically 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.

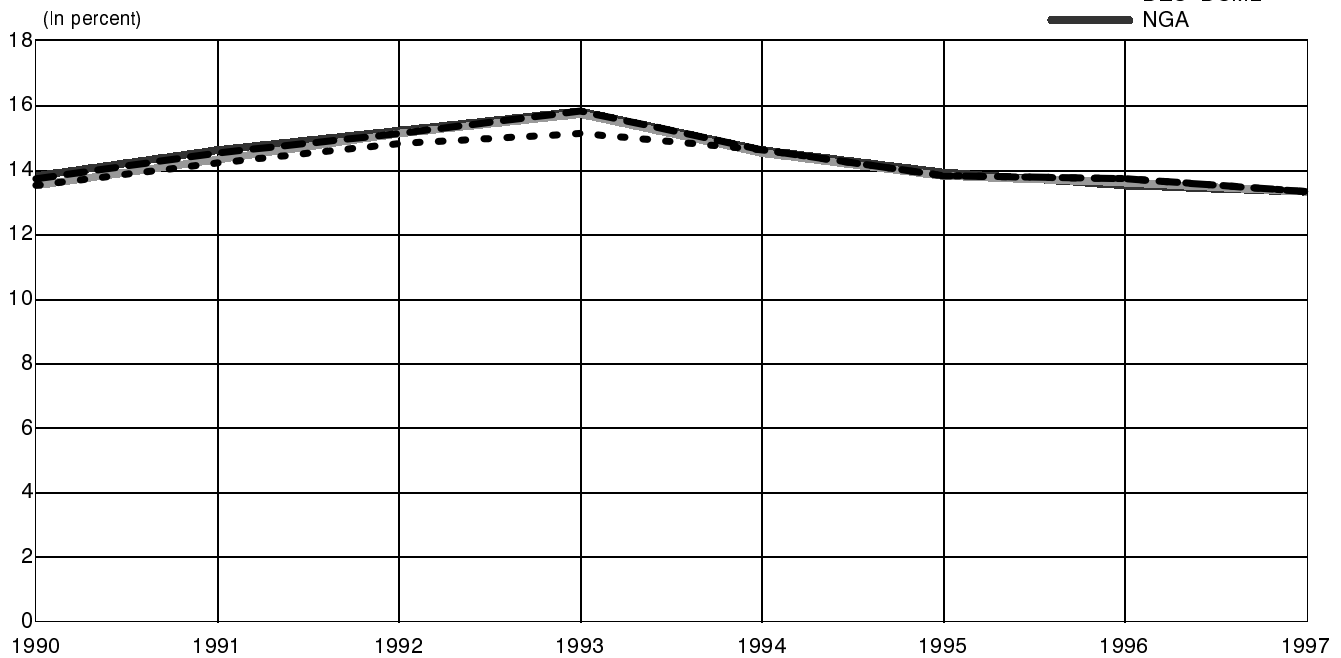
We have partially implemented the NAS measure using the 1991 panel of the SIPP in previous work.³⁰ That work presented poverty estimates using thresholds derived from the CEX for 1991, and family resources based on data from the 1991 panel of the SIPP and the March 1992 CPS. The resulting poverty rates were compared with those based on the official measure.

The poverty rates estimated in our previous work employ the current official definitions using CPS data, and a similarly defined measure using SIPP data.³¹ Annual before-tax cash income is compared against the official

³⁰Short et al., May 1998.

³¹Official U.S. poverty estimates are based only on the CPS.

Figure 22.
**Standardized Poverty Rates With Thresholds Backcasted
 With CPI-U: 1990 - 1997**



NAS-National Academy of Sciences.
 DES-DCM2-Child care method based on AFDC program allowances and three-parameter equivalence scale.
 NGA-NAS measure with no geographic adjustment.
 Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Table B7.

poverty thresholds to determine poverty status. No adjustment for taxes paid was made to the SIPP resource measure reported in that paper. While taxes paid are collected in a topical module in the SIPP, these data are not well reported. Ongoing efforts to model taxes in SIPP³² will be incorporated in a resource measure in future work.

Estimates show that, in 1991, the official poverty rate for all persons was 14.2 percent and a similarly defined estimate in the SIPP yielded a poverty rate of 12.1 percent. There are many reasons why the SIPP produces poverty rates below those in the CPS. One reason is that, as an income survey, SIPP is designed to do a more complete job of collecting income data.³³ Other possible factors are sub-annual changes in family composition, accounted for in the SIPP measure, and attrition bias in the SIPP. Consequently, the measure based on the official definition results in poverty rates that are consistently lower when the SIPP rather than the CPS is used.

As noted in earlier sections of this report, experimental poverty rates calculated using the CPS are higher for all groups than official rates. Using the SIPP, the overall rate

increases from 12.1 percent under the official definition to 13.6 percent under the NAS measure.³⁴

It is important to note that the SIPP estimates reported in Short et al. (1998) are based on data from the 1991 panel. These estimates combine information reported every 4 months across the calendar year. They are weighted using the calendar year weights for 1991. Research has been conducted to investigate the degree of attrition bias measurable in SIPP longitudinal files, particularly in the area of poverty statistics. This research suggests that there is a significant degree of this bias present in our estimates. Since research shows that people who are struggling to get along are less likely to remain in the survey, poverty estimates using the SIPP are biased downward.³⁵

As noted earlier, the 1996 panel of SIPP is a 4-year panel. Methodological investigation by the Census Bureau

³⁴See also Iceland et al., 1999, for alternative poverty rate estimates using 1992 SIPP data.

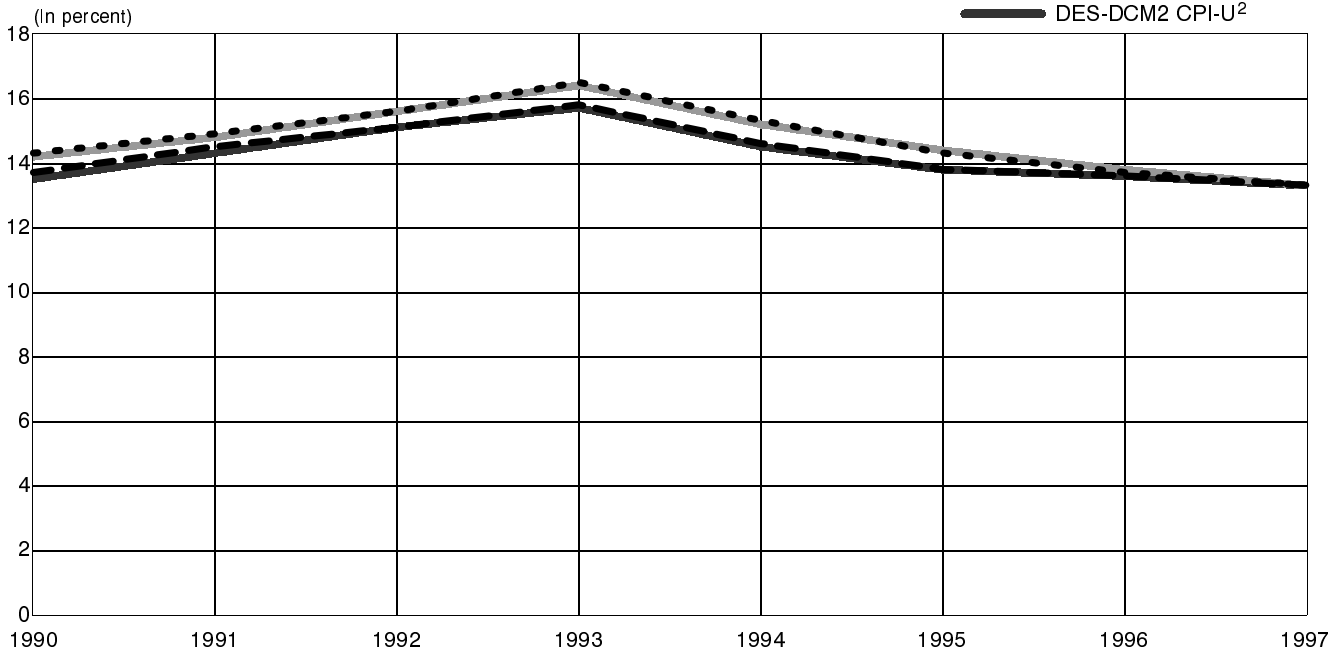
³⁵Huggins and Winters, 1995, reported that the poverty rate for the first quarter of 1991 for those respondents who left the panel at some point was 15.7 percent, while the first-quarter poverty rate for those with a complete set of interviews was only 11.5 percent.

³²Dickert et al., 1994.

³³Coder and Scoon-Rogers, 1996.

Figure 23.

**Standardized Poverty Rates With Year-to-Year Changes in Thresholds
Based on CEX and CPI-U: 1990 - 1997**



1. Thresholds in all years based on CEX data.
2. Thresholds in 1997 based on CEX, other years adjusted from 1997 by change in CPI-U.

Source: U.S. Census Bureau, Current Population Reports, Experimental Poverty Measures: 1990 to 1997, P60-205, Tables B5 and B7.

has concluded that a time series of official statistics, such as poverty, must be based on surveys with consistent design characteristics. For a longitudinal survey like the SIPP, this means that the characteristics of the sample (consisting of households which stay in sample for several years) must not change from year to year. But we know from past research that families in poverty leave the sample at higher rates than nonpoverty families. As a consequence, direct survey estimates cannot be used without accounting for and correcting the bias introduced by this differential attrition.

To address this problem, we have proposed a survey redesign for SIPP with constant attrition bias (similar to the design of the CPS) that allows us to measure year-to-year changes accurately (if both years' estimates are biased in the same way, their difference is not biased). Constant attrition bias for an annual statistic like poverty can be obtained by starting a new SIPP panel each year just as the CPS adds a new sample each month to permit accurate measurement of month-to-month changes in unemployment. Specifically, we propose fielding a new SIPP panel each year, with each panel collecting data for 3 years.³⁶ As

part of this design the sample size must be sufficient to produce a time series of poverty statistics with the same variance (or less) as the March CPS estimates. Each panel would provide a complete measure of calendar-year income. The current plan is to supplement the existing longitudinal panel with two additional smaller panels. These additional panels will enable us to produce stable cross-section estimates and to allow time-series comparisons.

Adopting the SIPP as the official data source for poverty measurement, as recommended by the NAS panel, would place special demands on the SIPP and the imputation methods used to estimate values for the additions and subtractions to obtain a SIPP-based resource measure. For example, we will continue working on the medical out-of-pocket valuations. We have demonstrated in an earlier section that medical out-of-pocket imputations have a great impact on poverty rates over time and on specific population subgroups at any point in time. Thus, it is imperative that we focus on the valuation methods used for this important element of poverty measurement. In the future, we plan to statistically match new data collected in the SIPP with data collected in the 1996 (and later) Medical Expenditure Panel Survey.

³⁶Weinberg et al., 1998.

B. Consumer Expenditure Survey

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

The panel recommended that the CEX be used for deriving and updating the poverty thresholds, as we have done in this report. In these calculations we have used 3-year averages to estimate median expenditures for a reference family of two adults with two children on the basic bundle of commodities. The 3 years of data are used to compensate for the relatively small sample sizes of the survey (currently approximately 5,000 consumer unit interviews each quarter, increasing to 7,800 per quarter in 1999) and also to smooth any fluctuations from year to year. The reference family represented about 9.5 percent of all consumer units participating in the interview survey in the 1988-1997 period.

Improvements to the CEX were also recommended by the panel. Among these were an increase in the sample size to improve the quality of the data for updating poverty thresholds. The panel also suggested development of methods to reduce reporting errors and to improve response rates. In addition, the panel recommended an evaluation of the CEX in terms of overall design, which might include following family members over time in order to collect expenditures on an annual basis, the reference period used here to assess poverty status.

We have identified several other areas for improvement, not mentioned by the panel, which we consider need to be made in the CEX if it is to be more useful in the production of poverty thresholds. Among these are the collection of information related to school breakfast and lunch programs, WIC programs, and energy assistance. If, as the panel suggested, the preferable consumption definition of shelter for owner occupants were adopted for the thresholds, additional data on housing and neighborhood quality would be desirable. Also, if at some time in the future the CEX were used as a source of medical care expenditure information, the total number of persons in the consumer unit with private coverage would be needed. Currently, while information about private policies is collected, determination of which members are covered is not possible. The total number of members covered by public insurance is already being collected in the CEX. Related to medical care expenditures, data on the health status of members of the family would also be needed in order to permit

more accurate matching of medical care expenditures to particular persons and families.

C. Decennial Census, the American Community Survey, and the Census Bureau’s Small Area Income and Poverty Estimates (SAIPE) Program

One effect of adopting a more complex definition of resources as specified by the panel would be to make the poverty definition less “portable” across surveys. At the present time, any survey that collects basic income information can be used to compute poverty estimates that are, for the most part, conceptually consistent with the U.S. official poverty measure (though the actual rates may vary significantly from the official poverty rates, particularly if the income questions are not as detailed as those asked on the CPS or if the accounting period or unit of analysis differs).

This is particularly important when one considers the decennial census, which is the premier source of small area poverty data. Decennial poverty data are used to allocate billions of dollars in Federal funds annually. The 2000 census long form includes questions on money income only. If the panel’s recommendations were to be largely adopted, future funding formulas that employ poverty as a criterion would either have to make extensive use of modeling (to impute the components of the resource definition not included in the decennial census), use a definition of poverty that differs from the official measure, or ensure that questions are added to obtain the required data. We see these issues as challenges that would have to be met rather than as reasons not to make the changes to the resource definition.

These same issues apply to other programs and surveys that are available to provide estimates of poverty for small geographic areas, such as the Census Bureau’s Continuous Measurement program. This program includes both the American Community Survey (ACS) and the Small Area Income and Poverty Estimates (SAIPE) program. The ACS includes questions similar to those on the decennial census long form. Thus, like the census, the ACS does not collect the necessary information to produce a measure as complex as that recommended by the NAS panel, though questionnaire changes could be made in 2003. The ACS is expected to have more flexibility to respond to the new content needs of a revised poverty definition than the decennial long form. The SAIPE estimates, which use decennial poverty information as a predictor variable, currently do not have access to the wide variety of information required to fully implement this measure.

VI. FUTURE RESEARCH

Future poverty measurement research should focus on refining the poverty thresholds and further examining the resource measure. This section describes a number of such possibilities.

Determining how one adjusts poverty thresholds for geographic differences in the cost of housing and in the overall cost of living is a critical area for further research.³⁷ 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 conform to other research.³⁸ However, the procedure does not account for housing cost differences within areas, such as differences in costs between central cities or suburbs of large metropolitan areas, or for differences in areas like Alaska and Hawaii versus other areas in the Pacific division. The method also does not account for housing quality differences. This topic requires further research and development.

Additional research is also needed on the resource side. For example, the imputations used in the measure for work-related expenses, including child care costs, are based on methods used by the panel, but other methods are available for imputing such costs.³⁹ Alternative methods to value housing subsidies for the CPS and the SIPP are currently being investigated.⁴⁰

Work is also proceeding on the imputation of medical out-of-pocket expenses. This report has shown that its effect on poverty rates is significant. Statistical matches across surveys may provide the most promising method of more accurately imputing these expenses. Specifically, questions are being added to the 1996 SIPP to improve this measure and facilitate statistical matches between the 1996 SIPP and the 1996 Medical Expenditure Panel Survey. Also, since the imputed values of medical expenditures are sensitive to the values of the benchmark totals used, it is imperative that further research be conducted to specify more appropriate sources for these inputs. Research should also examine whether benchmark totals should be used more widely to adjust other types of income that are known to be underreported.

Further research should continue on whether medical needs and other necessary expenses should be included on the resource or the threshold side. The methods of accounting for medical needs described in Section III of this report would result in different amounts of medical care needs being assigned to families which further change our interpretation of which groups are most likely to be poor. The issue of how to incorporate the medical care needs of families in a poverty measure is one that remains to be satisfactorily resolved.

Two more general issues for further research are the treatment of cohabitants and the treatment of the flow of services from owner-occupied housing. The panel recommended pooling resources and the needs of cohabiting persons to determine poverty status. Some work has been

done in this report comparing poverty rates based on the official definition which uses families, as defined by the Census Bureau, with others that include cohabiting individuals as the relevant unit of analysis.⁴¹ Changing the relevant unit for poverty analysis from the family to include persons who are cohabiting might be an issue for some population subgroups, such as young single people. Research is necessary on the extent of resource sharing among roommates and other household and family members to determine if the unit of analysis should be modified further.

Accounting for the flow of services from owner-occupied housing would affect both thresholds and resources. As noted by the panel, economists have long argued that the economic resources for owners and renters should be treated comparably because the resources available are related to a household's expenses. For example, if the household owns its home without a mortgage, then more money is available to purchase other needed goods and services although the household's consumption need for housing may not differ from that of owners with a mortgage or from that of renters. This study defines thresholds using the out-of-pocket shelter expenses reported (not including the reduction in mortgage principal) by the reference units for both renters and owners. The other method shown here estimated these costs by replacing the owners' expenses with their imputed rental shelter costs. An adjustment is also made in the resource measure to account for the flow of services of owner-occupied housing (see section III of this report).

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³⁸Citro and Michael, 1995, p. 199.

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⁴⁰Naifeh and Eller, 1997 and Shea et al., 1997.

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Appendix A.

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Table A1a. **Poverty Rates Using Experimental Thresholds: 1997**

[Percent poor]

	Number (1,000)	Official measure	Low point of ranges	Midpoint of ranges	High point of ranges
Total persons	268,480	13.3	11.7	12.9	14.2
Children	71,069	19.9	17.8	19.4	21.0
Nonelderly adults	165,329	10.9	9.7	10.7	11.7
Elderly	32,082	10.5	8.3	10.1	12.0
Unrelated individuals	10,634	21.0	16.4	20.2	23.9
Family members:					
Householder or spouse	19,445	5.3	4.2	5.1	6.0
Other relative	2,003	6.1	5.2	5.9	7.1
White	221,200	11.0	9.6	10.8	11.8
Black	34,458	26.5	23.9	26.0	28.2
Other	12,822	16.1	15.0	15.6	16.9
Hispanic origin ¹	30,637	27.1	23.6	26.5	29.0
No workers	38,072	36.3	33.1	35.6	38.2
One or more workers	230,408	9.5	8.2	9.2	10.2
Persons in family of type:					
Married couple	175,892	6.4	5.4	6.2	7.0
Male householder	31,137	16.1	14.3	15.9	17.1
Female householder	61,452	31.5	28.4	30.8	33.4
Geographic regions:					
Northeast	51,202	12.6	11.2	12.3	13.3
Midwest	62,499	10.4	9.2	10.1	11.3
South	94,235	14.6	12.8	14.3	15.6
West	60,545	14.6	12.9	14.3	15.7
Metropolitan area:					
Central city	80,089	18.8	16.5	18.3	20.0
Not central city	136,055	9.0	8.0	8.8	9.7
Nonmetropolitan area	52,337	15.9	14.0	15.6	17.1

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A1b. **Distribution of the Population Using Experimental Thresholds: 1997**

[Percent]

	Total population	Poverty population			
		Official measure	Low point of ranges	Midpoint of ranges	High point of ranges
All.....	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	40.4	39.7	39.1
Nonelderly adults	61.6	50.8	51.1	51.0	50.8
Elderly.....	12.0	9.5	8.5	9.4	10.1
Unrelated individuals	4.0	6.3	5.6	6.2	6.7
Family members:					
Householder or spouse	7.2	2.9	2.6	2.8	3.1
Other relative	0.8	0.3	0.3	0.3	0.4
White.....	82.4	68.6	67.6	68.5	68.8
Black	12.8	25.6	26.3	25.8	25.6
Other.....	4.8	5.8	6.1	5.8	5.7
Hispanic origin ¹	11.4	23.4	23.1	23.3	23.3
No workers.....	14.2	38.8	40.2	39.0	38.2
One or more workers.....	85.8	61.2	59.9	61.0	61.8
Persons in family of type:					
Married couple	65.5	31.5	30.2	31.3	32.2
Male householder.....	11.6	14.1	14.2	14.3	14.0
Female householder	22.9	54.4	55.6	54.5	53.8
Geographic regions:					
Northeast	19.1	18.2	18.2	18.1	17.9
Midwest	23.3	18.3	18.4	18.2	18.6
South.....	35.1	38.7	38.6	38.8	38.5
West	22.6	24.9	24.8	24.9	25.0
Metropolitan area:					
Central city.....	29.8	42.2	42.2	42.2	42.0
Not central city	50.7	34.5	34.5	34.3	34.5
Nonmetropolitan area	19.5	23.3	23.3	23.5	23.5

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A2a. **Poverty Rates Using Alternative Equivalence Scales: 1997**

[Percent poor]

	Official measure	Two-parameter scales ¹						Three-parameter scale ²	Canadian scale ³
		f=0.65 p=0.70	f=0.75 p=0.70	f=0.70 p=0.70	f=0.5 p=1.00	f=0.65 p=.85	f=0.6 p=1.0		
All persons	13.3	13.1	12.3	12.7	13.4	12.7	12.7	13.1	13.8
Children	19.9	19.1	19.1	19.2	19.3	19.4	19.5	19.3	20.0
Nonelderly adults	10.9	10.8	10.2	10.4	11.0	10.3	10.4	10.9	11.3
Elderly	10.5	11.2	8.6	10.0	12.8	9.8	9.7	11.0	12.8
Unrelated individuals	21.0	18.7	12.0	15.8	24.0	15.9	16.6	19.9	24.0
Family members:									
Householder or spouse	5.3	7.5	6.9	7.1	7.3	6.7	6.3	6.4	7.3
Other relative	6.1	7.7	7.0	7.0	6.9	6.7	6.3	7.6	7.2
White	11.0	10.8	10.2	10.5	11.2	10.5	10.6	10.9	11.5
Black	26.5	26.1	24.9	25.4	26.8	25.5	25.6	26.4	27.5
Other	16.1	16.4	15.6	15.9	15.8	15.6	15.5	15.8	16.7
Hispanic origin ⁴	27.1	26.5	26.1	26.3	26.4	26.1	26.2	26.8	27.7
No workers	36.3	36.5	33.1	34.8	38.5	34.7	34.9	36.1	38.4
One or more workers	9.5	9.2	8.9	9.0	9.3	9.0	9.1	9.3	9.7
Persons in family of type:									
Married couple	6.4	6.6	6.6	6.6	6.3	6.5	6.3	6.5	6.7
Male householder	16.1	14.9	12.9	13.9	16.4	13.8	14.4	15.3	16.3
Female householder	31.5	30.5	28.5	29.4	32.3	29.8	30.3	31.0	32.8
Geographic regions:									
Northeast	12.6	12.3	11.5	11.9	12.7	11.9	12.0	12.4	13.0
Midwest	10.4	10.1	9.5	9.8	10.6	9.8	9.9	10.1	10.9
South	14.6	14.7	13.8	14.3	15.0	14.2	14.2	14.7	15.3
West	14.6	14.2	13.7	13.9	14.4	13.8	13.9	14.3	15.1
Metropolitan area:									
Central city	18.8	18.3	17.3	17.7	18.8	17.7	17.9	18.4	19.4
Not central city	9.0	8.9	8.4	8.6	9.1	8.6	8.6	8.8	9.3
Nonmetropolitan area	15.9	16.0	15.1	15.6	16.5	15.5	15.5	16.1	16.7
Number of persons in family:									
1	20.9	18.6	15.1	16.8	21.4	16.9	17.7	19.2	21.4
2	8.3	9.2	8.4	8.8	9.6	8.6	8.5	8.6	9.4
3	10.9	11.9	11.4	11.6	12.2	11.7	11.7	12.6	12.0
4	10.4	10.3	10.2	10.2	10.4	10.3	10.4	10.4	10.5
5	14.2	13.6	13.8	13.7	13.2	13.6	13.5	13.6	13.9
6	20.7	19.4	20.5	19.8	17.8	19.8	19.4	18.9	20.3
7	29.1	27.5	28.7	27.9	25.4	27.2	26.8	27.3	28.7
8	27.3	23.8	25.2	23.8	21.7	25.2	24.8	22.9	26.9
9	35.9	26.5	28.3	28.3	17.7	26.5	26.5	21.6	30.2
10	45.9	39.1	48.1	45.3	33.4	41.3	39.5	36.5	50.3

¹Two-parameter scale = (adults + p * children)^f

²Three-parameter scale = (ratio of the scale for 2 adults to one adult is 1.41

For single parents (adults + .8 + .5 * children - 1)⁻⁷

All other families (adults + .5 * children)⁻⁷)

³Canadian scale = (1 + .4 * (adults - 1) + .4 * (first child) + .3 * (children - 1))

⁴Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A2b. **Distribution of the Population Using Alternative Equivalence Scales: 1997**

[Percent]

	Total population	Poverty population								Three-parameter scale ²	Canadian scale ³
		Official measure	Two-parameter scales ¹								
			f=0.65 p=0.70	f=0.75 p=0.70	f=0.70 p=0.70	f=0.5 p=1.00	f=0.65 p=.85	f=0.6 p=1.0			
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Children	26.5	39.7	38.8	41.0	40.0	38.0	40.6	40.7	38.9	38.5	
Nonelderly adults	61.6	50.8	50.9	50.7	50.6	50.5	50.2	50.2	51.1	50.4	
Elderly	12.0	9.5	10.3	8.3	9.4	11.4	9.2	9.2	10.0	11.1	
Unrelated individuals	4.0	6.3	5.7	3.8	4.9	7.1	5.0	5.2	6.0	6.9	
Family members:											
Householder or spouse	7.2	2.9	4.1	4.0	4.1	3.9	3.8	3.6	3.6	3.8	
Other relative	0.8	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
White	82.4	68.6	68.4	68.1	68.3	68.8	68.2	68.4	68.4	68.6	
Black	12.8	25.6	25.6	25.9	25.7	25.6	25.9	25.8	25.9	25.6	
Other	4.8	5.8	6.0	6.0	6.0	5.6	5.9	5.8	5.8	5.8	
Hispanic origin ⁴	11.4	23.4	23.2	24.2	23.7	22.4	23.5	23.5	23.3	23.0	
No workers	14.2	38.8	39.6	38.0	39.0	40.7	38.9	39.0	39.1	39.5	
One or more workers	85.8	61.2	60.4	62.0	61.0	59.3	61.1	61.1	60.9	60.5	
Persons in family of type:											
Married couple	65.5	31.5	33.3	35.1	34.2	30.7	33.4	32.3	32.2	31.7	
Male householder	11.6	14.1	13.2	12.1	12.7	14.2	12.7	13.1	13.6	13.8	
Female householder	22.9	54.4	53.4	52.9	53.1	55.2	53.9	54.6	54.2	54.5	
Geographic regions:											
Northeast	19.1	18.2	18.0	17.8	17.9	18.1	17.9	18.1	18.1	18.0	
Midwest	23.3	18.3	18.0	17.9	17.9	18.4	18.1	18.1	18.0	18.5	
South	35.1	38.7	39.6	39.2	39.5	39.2	39.5	39.3	39.4	38.9	
West	22.6	24.9	24.4	25.1	24.7	24.2	24.6	24.6	24.6	24.7	
Metropolitan area:											
Central city	29.8	42.2	41.7	41.8	41.7	41.8	41.8	42.0	41.9	42.0	
Not central city	50.7	34.5	34.4	34.4	34.3	34.2	34.3	34.2	34.1	34.3	
Nonmetropolitan area	19.5	23.3	23.9	23.8	24.1	24.0	24.0	23.7	24.0	23.7	
Number of persons in family:											
1	15.5	24.4	22.2	19.0	20.6	24.7	20.7	21.6	22.7	24.1	
2	23.1	14.4	16.4	15.6	16.1	16.5	15.7	15.5	15.1	15.7	
3	18.8	15.4	17.1	17.3	17.1	17.1	17.4	17.3	18.1	16.4	
4	22.1	17.4	17.4	18.3	17.9	17.1	18.0	18.1	17.6	16.9	
5	12.4	13.3	13.0	13.9	13.5	12.2	13.4	13.2	12.9	12.6	
6	4.7	7.4	7.0	7.8	7.4	6.3	7.4	7.2	6.8	6.9	
7	1.9	4.1	4.0	4.4	4.1	3.6	4.0	4.0	3.9	3.9	
8	0.8	1.7	1.5	1.6	1.5	1.3	1.6	1.6	1.4	1.6	
9	0.3	0.8	0.6	0.7	0.7	0.4	0.6	0.6	0.5	0.6	
10	0.3	1.2	1.0	1.3	1.2	0.9	1.1	1.1	1.0	1.3	

¹Two-parameter scale = (adults + p * children)^f

²Three-parameter scale = (ratio of the scale for 2 adults to one adult is 1.41

For single parents (adults + .8 + .5 * children - 1)⁻⁷

All other families (adults + .5 * children)⁻⁷)

³Canadian scale = (1 + .4 * (adults - 1) + .4 * (first child) + .3 * (children - 1))

⁴Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A3a. **Poverty Rates With Geographic Adjustment: 1997**

[Percent poor]

	Official measure	With geographic adjustment ¹
Total persons	13.3	13.0
Children	19.9	19.4
Nonelderly adults	10.9	10.8
Elderly	10.5	10.3
Unrelated individuals	21.0	20.5
Family members: ¹		
Householder or spouse	5.3	5.1
Other relative	6.1	6.3
White	11.0	10.8
Black	26.5	26.3
Other	16.1	16.8
Hispanic origin ²	27.1	28.0
No workers	36.3	35.9
One or more workers	9.5	9.3
Persons in family of type:		
Married couple	6.4	6.2
Male householder	16.1	16.1
Female householder	31.5	31.1
Geographic regions:		
Northeast	12.6	13.9
Midwest	10.4	9.6
South	14.6	13.1
West	14.6	15.8
Metropolitan area:		
Central city	18.8	19.3
Not central city	9.0	9.4
Nonmetropolitan area	15.9	13.1

¹Geographic adjustments are normalized to achieve a national weighted average =1.00.

²Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A3b. **Distribution of the Population With Geographic Adjustment: 1997**

[Percent]

	Total population	Poverty population	
		Official measure	With geographic adjustment ¹
All	100.0	100.0	100.0
Children	26.5	39.7	39.4
Nonelderly adults	61.6	50.8	51.2
Elderly	12.0	9.5	9.4
Unrelated individuals	4.0	6.3	6.2
Family members: ¹			
Householder or spouse	7.2	2.9	2.8
Other relative	0.8	0.3	0.4
White	82.4	68.6	68.0
Black	12.8	25.6	25.9
Other	4.8	5.8	6.1
Hispanic origin ²	11.4	23.4	24.5
No workers	14.2	38.8	39.1
One or more workers	85.8	61.2	61.0
Persons in family of type:			
Married couple	65.5	31.5	31.1
Male householder	11.6	14.1	14.4
Female householder	22.9	54.4	54.6
Geographic regions:			
Northeast	19.1	18.2	20.4
Midwest	23.3	18.3	17.1
South	35.1	38.7	35.3
West	22.6	24.9	27.3
Metropolitan area:			
Central city	29.8	42.2	44.1
Not central city	50.7	34.5	36.4
Nonmetropolitan area	19.5	23.3	19.5

¹Geographic adjustments are normalized to achieve a national weighted average =1.00.

²Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A4a. **Poverty Rates Adding Food Stamp and School Lunch Subsidies to Resources: 1997**

[Percent poor]

	Official measure	With food stamps	With school lunches	With both
All persons	13.3	12.7	13.0	12.4
Children	19.9	18.8	19.3	18.2
Nonelderly adults	10.9	10.5	10.8	10.4
Elderly	10.5	10.2	10.5	10.1
Unrelated individuals	21.0	20.2	21.0	20.2
Family members:				
Householder or spouse	5.3	5.1	5.3	5.1
Other relative	6.1	6.0	6.0	5.9
White	11.0	10.6	10.8	10.4
Black	26.5	25.3	26.1	24.7
Other	16.1	14.8	15.6	14.7
Hispanic origin ¹	27.1	25.8	26.2	25.1
No workers	36.3	35.1	36.1	35.1
One or more workers	9.5	9.0	9.2	8.7
Persons in family of type:				
Married couple	6.4	6.0	6.2	5.9
Male householder	16.1	15.7	16.0	15.5
Female householder	31.5	30.1	31.0	29.5
Geographic regions:				
Northeast	12.6	12.0	12.4	11.8
Midwest	10.4	10.0	10.1	9.8
South	14.6	14.1	14.4	13.8
West	14.6	13.9	14.3	13.6
Metropolitan area:				
Central city	18.8	17.9	18.3	17.5
Not central city	9.0	8.6	8.8	8.5
Nonmetropolitan area	15.9	15.2	15.6	14.9

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A4b. **Distribution of the Population Adding Food Stamp and School Lunch Subsidies to Resources: 1997**
 [Percent]

	Total population	Poverty population			
		Official measure	With food stamps	With school lunches	With both
All.....	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	39.2	39.2	38.7
Nonelderly adults	61.6	50.8	51.2	51.1	51.6
Elderly.....	12.0	9.5	9.6	9.7	9.8
Unrelated individuals	4.0	6.3	6.3	6.4	6.4
Family members:					
Householder or spouse	7.2	2.9	2.9	2.9	3.0
Other relative	0.8	0.3	0.4	0.3	0.4
White.....	82.4	68.6	68.8	68.5	68.8
Black.....	12.8	25.6	25.7	25.8	25.6
Other.....	4.8	5.8	5.6	5.7	5.7
Hispanic origin ¹	11.4	23.4	23.3	23.0	23.0
No workers.....	14.2	38.8	39.4	39.4	40.0
One or more workers.....	85.8	61.2	60.7	60.7	60.0
Persons in family of type:					
Married couple	65.5	31.5	31.2	31.0	31.1
Male householder.....	11.6	14.1	14.3	14.3	14.5
Female householder	22.9	54.4	54.4	54.7	54.4
Geographic regions:					
Northeast	19.1	18.2	18.1	18.2	18.2
Midwest	23.3	18.3	18.3	18.2	18.3
South.....	35.1	38.7	39.0	38.9	38.9
West.....	22.6	24.9	24.7	24.8	24.7
Metropolitan area:					
Central city.....	29.8	42.2	42.1	42.1	42.1
Not central city	50.7	34.5	34.6	34.5	34.6
Nonmetropolitan area	19.5	23.3	23.3	23.4	23.3

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A5a. **Poverty Rates Adding Housing Subsidies and Heating Assistance to Resources: 1997**

[Percent poor]

	Official measure	With housing subsidies	With heating assistance	With both
All persons	13.3	12.8	13.2	12.8
Children	19.9	19.5	19.8	19.4
Nonelderly adults	10.9	10.6	10.9	10.6
Elderly	10.5	9.3	10.5	9.2
Unrelated individuals	21.0	17.5	20.8	17.3
Family members:				
Householder or spouse	5.3	5.1	5.2	5.1
Other relative	6.1	5.8	6.1	5.8
White	11.0	10.7	11.0	10.6
Black	26.5	25.4	26.4	25.4
Other	16.1	15.6	16.1	15.6
Hispanic origin ¹	27.1	26.3	27.1	26.3
No workers	36.3	34.4	36.2	34.3
One or more workers	9.5	9.2	9.4	9.2
Persons in family of type:				
Married couple	6.4	6.3	6.4	6.3
Male householder	16.1	15.3	16.1	15.3
Female householder	31.5	30.1	31.4	30.0
Geographic regions:				
Northeast	12.6	11.7	12.6	11.6
Midwest	10.4	10.1	10.4	10.0
South	14.6	14.3	14.6	14.3
West	14.6	14.2	14.6	14.2
Metropolitan area:				
Central city	18.8	17.9	18.7	17.9
Not central city	9.0	8.8	9.0	8.7
Nonmetropolitan area	15.9	15.4	15.8	15.4

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A5b. **Distribution of the Population Adding Housing Subsidies and Heating Assistance to Resources: 1997**

[Percent]

	Total population	Poverty population			
		Official measure	With housing subsidies	With heating assistance	With both
All.....	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	40.3	39.7	40.3
Nonelderly adults	61.6	50.8	51.1	50.9	51.1
Elderly.....	12.0	9.5	8.7	9.5	8.6
Unrelated individuals	4.0	6.3	5.4	6.2	5.4
Family members:					
Householder or spouse	7.2	2.9	2.9	2.9	2.9
Other relative.....	0.8	0.3	0.3	0.3	0.3
White.....	82.4	68.6	68.7	68.6	68.6
Black.....	12.8	25.6	25.5	25.6	25.6
Other.....	4.8	5.8	5.8	5.8	5.8
Hispanic origin ¹	11.4	23.4	23.5	23.4	23.5
No workers.....	14.2	38.8	38.2	38.8	38.1
One or more workers.....	85.8	61.2	61.8	61.2	61.9
Persons in family of type:					
Married couple	65.5	31.5	32.2	31.5	32.2
Male householder.....	11.6	14.1	13.9	14.1	13.9
Female householder	22.9	54.4	54.0	54.4	53.9
Geographic regions:					
Northeast	19.1	18.2	17.4	18.1	17.4
Midwest	23.3	18.3	18.4	18.2	18.3
South.....	35.1	38.7	39.2	38.7	39.2
West	22.6	24.9	25.1	24.9	25.1
Metropolitan area:					
Central city.....	29.8	42.2	41.8	42.3	41.8
Not central city	50.7	34.5	34.7	34.4	34.7
Nonmetropolitan area	19.5	23.3	23.5	23.4	23.5

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A6a. **Poverty Rates Subtracting Alternative Valuations of Work-Related Expenses From Resources: 1997**

[Percent poor]

	Official measure	Child care 1992 SIPP model	Child care 85% SIPP medians	Child care AFDC guidelines	Other work expenses	All expenses		
						1992 SIPP model	85% SIPP medians	AFDC guidelines
All persons	13.3	13.6	13.9	13.7	14.0	14.4	14.7	14.5
Children	19.9	20.7	21.3	20.8	20.8	21.7	22.4	21.9
Nonelderly adults	10.9	11.2	11.4	11.2	11.7	12.0	12.2	12.0
Elderly	10.5	10.5	10.6	10.5	10.6	10.7	10.7	10.7
Unrelated individuals	21.0	21.0	21.0	21.0	21.1	21.1	21.1	21.1
Family members:								
Householder or spouse	5.3	5.3	5.3	5.3	5.4	5.4	5.4	5.4
Other relative	6.1	6.4	6.4	6.3	6.6	6.9	6.9	6.9
White	11.0	11.3	11.6	11.4	11.7	12.0	12.2	12.1
Black	26.5	27.4	28.2	27.5	27.8	28.7	29.8	29.0
Other	16.1	16.2	16.4	16.2	16.9	17.0	17.2	17.0
Hispanic origin ¹	27.1	28.0	28.6	28.0	28.9	29.6	30.4	29.8
No workers	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3
One or more workers	9.5	9.9	10.3	10.0	10.3	10.8	11.2	10.9
Persons in family of type:								
Married couple	6.4	6.5	6.7	6.6	6.9	7.1	7.3	7.2
Male householder	16.1	16.4	16.8	16.5	17.1	17.4	17.8	17.5
Female householder	31.5	32.4	33.4	32.7	32.7	33.6	34.6	33.8
Geographic regions:								
Northeast	12.6	12.8	13.0	12.8	13.0	13.3	13.6	13.3
Midwest	10.4	10.8	11.0	10.9	11.1	11.5	11.8	11.6
South	14.6	15.0	15.5	15.1	15.5	15.8	16.3	16.0
West	14.6	15.0	15.4	15.1	15.6	16.0	16.3	16.1
Metropolitan area:								
Central city	18.8	19.2	19.7	19.3	19.8	20.4	20.8	20.5
Not central city	9.0	9.3	9.5	9.3	9.5	9.8	10.0	9.9
Nonmetropolitan area	15.9	16.3	16.8	16.3	16.8	17.2	17.7	17.3

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A6b. **Distribution of the Population Subtracting Alternative Valuations of Work-Related Expenses From Resources: 1997**

[Percent]

	Total population	Poverty population							All expenses		
		Official measure	Child care 1992 SIPP model	Child care 85% SIPP medians	Child care AFDC guidelines	Other work expenses	1992 SIPP model	85% SIPP medians	AFDC guidelines		
All.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
Children.....	26.5	39.7	40.2	40.5	40.3	39.4	39.9	40.2	40.0		
Nonelderly adults.....	61.6	50.8	50.6	50.5	50.5	51.5	51.3	51.1	51.2		
Elderly.....	12.0	9.5	9.3	9.0	9.2	9.1	8.9	8.7	8.8		
Unrelated individuals.....	4.0	6.3	6.1	6.0	6.1	6.0	5.8	5.7	5.8		
Family members:											
Householder or spouse.....	7.2	2.9	2.8	2.7	2.8	2.8	2.7	2.7	2.7		
Other relative.....	0.8	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4		
White.....	82.4	68.6	68.5	68.5	68.5	68.8	68.7	68.5	68.7		
Black.....	12.8	25.6	25.8	25.9	25.8	25.5	25.6	26.0	25.7		
Other.....	4.8	5.8	5.7	5.6	5.7	5.8	5.6	5.6	5.6		
Hispanic origin ¹	11.4	23.4	23.4	23.4	23.4	23.6	23.5	23.5	23.5		
No workers.....	14.2	38.8	37.8	36.9	37.6	36.7	35.8	34.9	35.5		
One or more workers.....	85.8	61.2	62.2	63.1	62.4	63.3	64.2	65.1	64.5		
Persons in family of type:											
Married couple.....	65.5	31.5	31.5	31.2	31.4	32.4	32.4	32.3	32.5		
Male householder.....	11.6	14.1	14.0	14.0	14.0	14.1	14.1	14.0	14.0		
Female householder.....	22.9	54.4	54.5	54.8	54.7	53.5	53.6	53.7	53.5		
Geographic regions:											
Northeast.....	19.1	18.2	18.0	17.8	17.9	17.7	17.6	17.6	17.5		
Midwest.....	23.3	18.3	18.5	18.4	18.5	18.4	18.7	18.6	18.7		
South.....	35.1	38.7	38.7	38.9	38.7	38.8	38.6	38.8	38.8		
West.....	22.6	24.9	24.8	24.9	24.9	25.1	25.1	25.0	25.1		
Metropolitan area:											
Central city.....	29.8	42.2	42.0	42.0	42.1	42.1	42.2	42.1	42.1		
Not central city.....	50.7	34.5	34.6	34.4	34.6	34.5	34.5	34.4	34.6		
Nonmetropolitan area.....	19.5	23.3	23.4	23.5	23.3	23.4	23.3	23.4	23.3		

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A7a. **Poverty Rates Taking Account of Taxes in Resources: 1997**

[Percent poor]

	Official measure	Includes net capital gains					All taxes
		Social security payroll tax	Federal income	State income	Federal and state	Federal and state plus EIC	
All persons	13.3	14.1	13.3	13.3	13.4	11.9	12.7
Children	19.9	21.1	19.8	19.9	19.9	16.9	18.3
Nonelderly adults	10.9	11.7	11.0	11.0	11.1	10.0	10.8
Elderly	10.5	10.6	10.5	10.5	10.5	10.5	10.5
Unrelated individuals	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Family members:							
Householder or spouse	5.3	5.4	5.3	5.3	5.3	5.2	5.3
Other relative	6.1	6.4	6.1	6.2	6.2	5.7	5.9
White	11.0	11.7	11.1	11.1	11.1	9.8	10.6
Black	26.5	28.1	26.6	26.6	26.7	24.1	25.3
Other	16.1	16.9	16.2	16.1	16.2	15.2	16.0
Hispanic origin ¹	27.1	29.0	27.1	27.1	27.3	23.1	25.6
No workers	36.3	36.3	36.3	36.3	36.3	36.3	36.3
One or more workers	9.5	10.4	9.5	9.5	9.6	7.8	8.9
Persons in family of type:							
Married couple	6.4	7.0	6.4	6.4	6.4	5.3	6.0
Male householder	16.1	17.1	16.4	16.2	16.5	15.6	16.6
Female householder	31.5	32.6	31.5	31.6	31.7	28.7	30.0
Geographic regions:							
Northeast	12.6	13.2	12.7	12.6	12.7	11.5	12.2
Midwest	10.4	11.2	10.4	10.5	10.6	9.4	10.1
South	14.6	15.5	14.6	14.6	14.7	13.0	14.0
West	14.6	15.6	14.7	14.7	14.8	13.0	14.1
Metropolitan area:							
Central city	18.8	19.8	18.8	18.8	18.9	16.8	18.0
Not central city	9.0	9.6	9.0	9.0	9.1	8.1	8.7
Nonmetropolitan area	15.9	17.0	15.9	15.9	16.0	14.2	15.2

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A7b. **Distribution of the Population Taking Account of Taxes in Resources: 1997**

[Percent]

	Total population	Poverty population							
		Official measure	Includes net capital gains					Federal and state plus EIC	All taxes
			Social security payroll tax	Federal income	State income	Federal and state			
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Children	26.5	39.7	39.6	39.5	39.6	39.5	37.6	38.0	
Nonelderly adults	61.6	50.8	51.3	51.0	50.9	51.1	51.8	52.1	
Elderly	12.0	9.5	9.0	9.5	9.5	9.4	10.5	9.9	
Unrelated individuals	4.0	6.3	5.9	6.3	6.3	6.2	7.0	6.5	
Family members:									
Householder or spouse	7.2	2.9	2.8	2.9	2.9	2.9	3.2	3.0	
Other relative	0.8	0.3	0.3	0.3	0.4	0.4	0.4	0.3	
White	82.4	68.6	68.6	68.5	68.5	68.5	67.9	68.5	
Black	12.8	25.6	25.6	25.7	25.7	25.7	26.1	25.5	
Other	4.8	5.8	5.8	5.8	5.8	5.8	6.1	6.0	
Hispanic origin ¹	11.4	23.4	23.5	23.3	23.3	23.3	22.2	23.0	
No workers	14.2	38.8	36.6	38.7	38.7	38.5	43.3	40.4	
One or more workers	85.8	61.2	63.4	61.3	61.3	61.5	56.7	59.6	
Persons in family of type:									
Married couple	65.5	31.5	32.8	31.4	31.5	31.4	29.4	31.0	
Male householder	11.6	14.1	14.1	14.3	14.1	14.3	15.2	15.2	
Female householder	22.9	54.4	53.1	54.3	54.4	54.3	55.4	53.9	
Geographic regions:									
Northeast	19.1	18.2	17.8	18.2	18.1	18.1	18.5	18.2	
Midwest	23.3	18.3	18.6	18.3	18.4	18.4	18.4	18.5	
South	35.1	38.7	38.6	38.6	38.6	38.6	38.5	38.4	
West	22.6	24.9	25.0	25.0	24.9	24.9	24.7	24.9	
Metropolitan area:									
Central city	29.8	42.2	42.0	42.3	42.3	42.3	42.3	42.2	
Not central city	50.7	34.5	34.4	34.4	34.4	34.4	34.4	34.6	
Nonmetropolitan area	19.5	23.3	23.6	23.3	23.4	23.4	23.3	23.2	

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A8a. **Poverty Rates Including All In-Kind Transfers in Resources, Before and After Tax: 1997**

[Percent poor]

	Official measure	Before tax income with all in-kind benefits	After tax income with all in-kind benefits
All persons	13.3	11.8	11.1
Children	19.9	17.5	15.6
Nonelderly adults	10.9	9.9	9.7
Elderly	10.5	8.9	8.9
Unrelated individuals	21.0	16.8	16.8
Family members:			
Householder or spouse	5.3	4.9	5.0
Other relative	6.1	5.6	5.5
White	11.0	9.9	9.4
Black	26.5	23.2	21.5
Other	16.1	14.2	14.0
Hispanic origin ¹	27.1	24.2	22.3
No workers	36.3	32.8	32.9
One or more workers	9.5	8.4	7.6
Persons in family of type:			
Married couple	6.4	5.8	5.3
Male householder	16.1	14.6	15.3
Female householder	31.5	27.6	25.7
Geographic regions:			
Northeast	12.6	10.7	10.2
Midwest	10.4	9.4	8.8
South	14.6	13.2	12.3
West	14.6	13.1	12.4
Metropolitan area:			
Central city	18.8	16.4	15.5
Not central city	9.0	8.2	7.8
Nonmetropolitan area	15.9	14.2	13.2

¹ Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A8b. **Distribution of the Population Including All In-Kind Transfers in Resources, Before and After Tax: 1997**

[Percent]

	Total population	Poverty population		
		Official measure	Before tax income with all in-kind benefits	After tax income with all in-kind benefits
All	100.0	100.0	100.0	100.0
Children	26.5	39.7	39.3	37.1
Nonelderly adults	61.6	50.8	51.7	53.4
Elderly	12.0	9.5	9.0	9.6
Unrelated individuals	4.0	6.3	5.6	6.0
Family members:				
Householder or spouse	7.2	2.9	3.0	3.2
Other relative	0.8	0.3	0.4	0.4
White	82.4	68.6	69.1	69.3
Black	12.8	25.6	25.2	24.7
Other	4.8	5.8	5.8	6.0
Hispanic origin ¹	11.4	23.4	23.4	22.8
No workers	14.2	38.8	39.4	41.8
One or more workers	85.8	61.2	60.6	58.2
Persons in family of type:				
Married couple	65.5	31.5	32.1	31.3
Male householder	11.6	14.1	14.4	15.9
Female householder	22.9	54.4	53.5	52.8
Geographic regions:				
Northeast	19.1	18.2	17.3	17.5
Midwest	23.3	18.3	18.5	18.5
South	35.1	38.7	39.3	38.9
West	22.6	24.9	25.0	25.2
Metropolitan area:				
Central city	29.8	42.2	41.5	41.5
Not central city	50.7	34.5	35.1	35.3
Nonmetropolitan area	19.5	23.3	23.5	23.2

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A9a. **Poverty Rates Taking Account of Medical Care: 1997**

[Percent poor]

	Official measure	Deducting MOOP from income		Adding public insurance to income
		Official threshold	Experimental threshold	
All persons	13.3	16.3	15.6	12.0
Children	19.9	22.6	21.7	18.0
Nonelderly adults	10.9	13.0	12.4	10.1
Elderly	10.5	19.3	18.9	9.1
Unrelated individuals	21.0	33.9	28.0	17.9
Family members:				
Householder or spouse	5.3	12.3	14.7	4.7
Other relative	6.1	9.3	10.6	5.5
White	11.0	14.0	13.4	10.1
Black	26.5	30.0	28.5	23.7
Other	16.1	19.2	18.4	14.6
Hispanic origin ¹	27.1	31.2	30.2	24.8
No workers	36.3	44.3	42.9	33.3
One or more workers	9.5	11.7	11.1	8.5
Persons in family of type:				
Married couple	6.4	8.6	8.9	5.7
Male householder	16.1	19.2	16.4	15.0
Female householder	31.5	36.9	34.5	28.8
Geographic regions:				
Northeast	12.6	15.3	14.5	11.3
Midwest	10.4	13.4	12.8	9.5
South	14.6	17.8	17.3	13.3
West	14.6	17.7	16.8	13.4
Metropolitan area:				
Central city	18.8	22.1	20.9	16.9
Not central city	9.0	11.5	11.0	8.2
Nonmetropolitan area	15.9	19.9	19.5	14.6

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A9b. **Distribution of the Population Taking Account of Medical Care: 1997**

[Percent]

	Total population	Poverty population				Adding public insurance to income
		Official measure	Deducting MOOP from income		Experimental threshold	
			Official threshold			
All.....	100.0	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	36.6	36.8	39.5	39.5
Nonelderly adults	61.6	50.8	49.3	48.8	51.5	51.5
Elderly.....	12.0	9.5	14.1	14.5	9.0	9.0
Unrelated individuals	4.0	6.3	8.2	7.1	5.9	5.9
Family members:						
Householder or spouse	7.2	2.9	5.5	6.8	2.8	2.8
Other relative.....	0.8	0.3	0.4	0.5	0.3	0.3
White.....	82.4	68.6	70.8	71.0	68.9	68.9
Black.....	12.8	25.6	23.6	23.4	25.3	25.3
Other.....	4.8	5.8	5.6	5.6	5.8	5.8
Hispanic origin ¹	11.4	23.4	21.8	22.1	23.5	23.5
No workers.....	14.2	38.8	38.6	38.9	39.2	39.2
One or more workers.....	85.8	61.2	61.5	61.1	60.8	60.8
Persons in family of type:						
Married couple	65.5	31.5	34.6	37.2	30.9	30.9
Male householder.....	11.6	14.1	13.7	12.2	14.4	14.4
Female householder	22.9	54.4	51.7	50.6	54.7	54.7
Geographic regions:						
Northeast	19.1	18.2	17.9	17.7	17.9	17.9
Midwest	23.3	18.3	19.2	19.1	18.3	18.3
South.....	35.1	38.7	38.4	38.9	38.7	38.7
West	22.6	24.9	24.5	24.3	25.2	25.2
Metropolitan area:						
Central city.....	29.8	42.2	40.5	39.9	41.8	41.8
Not central city	50.7	34.5	35.7	35.7	34.6	34.6
Nonmetropolitan area	19.5	23.3	23.8	24.4	23.6	23.6

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A10a. **Poverty Rates Taking Account of Owner-Occupied Housing: 1997**

[Percent poor]

	Official measure	Estimated rental shelter cost in thresholds	Adding net return on home equity to income	Both in a combined measure
All persons	13.3	12.2	12.1	11.0
Children	19.9	18.5	18.8	17.6
Nonelderly adults	10.9	10.0	10.1	9.1
Elderly	10.5	9.3	7.4	6.3
Unrelated individuals	21.0	14.6	14.5	9.7
Family members:				
Householder or spouse	5.3	6.7	3.7	4.5
Other relative	6.1	6.6	5.3	5.7
White	11.0	10.1	9.9	9.0
Black	26.5	24.6	24.6	22.7
Other	16.1	15.3	15.2	14.6
Hispanic origin ¹	27.1	25.1	25.5	23.6
No workers	36.3	33.9	32.4	29.9
One or more workers	9.5	8.6	8.7	7.9
Persons in family of type:				
Married couple	6.4	6.3	5.7	5.5
Male householder	16.1	13.3	14.7	11.9
Female householder	31.5	28.5	29.0	26.3
Geographic regions:				
Northeast	12.6	11.4	11.7	10.6
Midwest	10.4	9.4	9.5	8.5
South	14.6	13.7	13.2	12.2
West	14.6	13.3	13.3	12.1
Metropolitan area:				
Central city	18.8	17.0	17.8	16.1
Not central city	9.0	8.3	7.9	7.3
Nonmetropolitan area	15.9	15.0	14.2	13.0

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A10b. **Distribution of the Population Taking Account of Owner-Occupied Housing: 1997**

[Percent]

	Total population	Poverty population			
		Official measure	Estimated rental shelter cost in thresholds	Adding net return on home equity to income	Both in a combined measure
All	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	40.3	41.2	42.1
Nonelderly adults	61.6	50.8	50.6	51.5	51.0
Elderly	12.0	9.5	9.1	7.3	6.8
Unrelated individuals	4.0	6.3	4.8	4.8	3.5
Family members:					
Householder or spouse	7.2	2.9	4.0	2.2	3.0
Other relative	0.8	0.3	0.4	0.3	0.4
White	82.4	68.6	68.1	67.8	67.3
Black	12.8	25.6	25.9	26.2	26.4
Other	4.8	5.8	6.0	6.0	6.3
Hispanic origin ¹	11.4	23.4	23.5	24.2	24.4
No workers	14.2	38.8	39.5	38.1	38.4
One or more workers	85.8	61.2	60.5	61.9	61.6
Persons in family of type:					
Married couple	65.5	31.5	33.8	30.8	32.9
Male householder	11.6	14.1	12.6	14.1	12.5
Female householder	22.9	54.4	53.6	55.1	54.7
Geographic regions:					
Northeast	19.1	18.2	17.9	18.5	18.3
Midwest	23.3	18.3	18.0	18.4	18.0
South	35.1	38.7	39.5	38.3	38.9
West	22.6	24.9	24.6	24.9	24.8
Metropolitan area:					
Central city	29.8	42.2	41.6	43.9	43.5
Not central city	50.7	34.5	34.4	33.2	33.6
Nonmetropolitan area	19.5	23.3	24.0	22.9	22.6

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A11a. **Poverty Rates Using Alternative Units of Analysis: 1997**

[Percent poor]

	Official measure	Cohabiting couples	...and housemate/roommate	...and roomer/boarder
All persons	13.3	12.7	11.7	11.5
Children	19.9	19.1	18.2	18.2
Nonelderly adults	10.9	10.4	9.1	8.9
Elderly	10.5	10.5	10.1	10.0
White	11.0	10.5	9.5	9.4
Black	26.5	25.8	24.5	24.3
Other	16.1	15.6	14.2	13.9
Hispanic origin ¹	27.1	26.4	25.2	25.0
No workers	36.3	34.9	31.7	31.2
One or more workers	9.5	9.0	8.3	8.2
Persons in family of type:				
Married couple	6.4	6.4	6.3	6.3
Male householder	16.1	15.5	11.9	11.3
Female householder	31.5	29.5	26.9	26.6
Geographic regions:				
Northeast	12.6	12.1	11.2	11.1
Midwest	10.4	9.7	8.9	8.8
South	14.6	14.1	13.1	13.0
West	14.6	14.1	12.6	12.3
Metropolitan area:				
Central city	18.8	18.1	16.8	16.6
Not central city	9.0	8.6	7.7	7.6
Nonmetropolitan area	15.9	15.0	14.1	14.0

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Table A11b. **Distribution of the Population Using Alternative Units of Analysis: 1997**

[Percent]

	Total population	Poverty population			
		Official measure	Cohabiting couples	...and housemate/roommate	...and roomer/boarder
All.....	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	39.9	41.7	42.0
Nonelderly adults	61.6	50.8	50.3	48.0	47.7
Elderly.....	12.0	9.5	9.8	10.3	10.4
White.....	82.4	68.6	68.1	67.1	67.0
Black.....	12.8	25.6	26.1	27.1	27.2
Other.....	4.8	5.8	5.9	5.8	5.8
Hispanic origin ¹	11.4	23.4	23.7	24.7	24.8
No workers.....	14.2	38.8	39.0	39.1	38.9
One or more workers.....	85.8	61.2	61.0	60.9	61.1
Persons in family of type:					
Married couple	65.5	31.5	32.8	35.2	35.6
Male householder.....	11.6	14.1	14.2	11.9	11.5
Female householder	22.9	54.4	53.1	52.9	53.0
Geographic regions:					
Northeast	19.1	18.2	18.2	18.4	18.4
Midwest	23.3	18.3	17.9	17.8	17.9
South.....	35.1	38.7	38.9	39.4	39.5
West	22.6	24.9	25.1	24.4	24.2
Metropolitan area:					
Central city.....	29.8	42.2	42.6	42.9	43.0
Not central city	50.7	34.5	34.4	33.5	33.3
Nonmetropolitan area	19.5	23.3	23.0	23.6	23.7

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulation of March 1998 Current Population Survey data.

Appendix B.

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Table B1a. **Standardized Poverty Rates: 1997**

	Official measure	Experimental measures (standardized to match the official rate)					
		NAS	DCM1 ^a	DCM2 ^b	DES-DCM2 ^c	NGA ^d	DES-DCM2-NGA ^e
All persons	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Children	19.9	17.6	17.9	17.7	17.3	17.4	17.2
Nonelderly adults	10.9	11.1	11.0	11.0	11.2	11.1	11.2
Elderly	10.5	15.0	14.5	14.9	14.9	15.3	15.2
Unrelated individuals	21.0	20.8	20.2	20.7	22.8	20.9	22.9
Family members:							
Householder or spouse	5.3	12.5	12.1	12.4	11.2	13.0	11.6
Other relative	6.1	8.9	8.4	8.9	8.6	8.7	8.6
White	11.0	11.5	11.5	11.5	11.5	11.5	11.6
Black	26.5	23.3	23.5	23.2	23.5	23.2	23.1
Other	16.1	17.0	16.7	16.9	16.9	16.3	15.9
Hispanic origin ¹	27.1	27.0	27.1	26.9	26.5	24.9	24.6
No workers	36.3	34.4	33.8	34.4	34.5	34.9	34.7
One or more workers	9.5	9.8	9.9	9.8	9.8	9.7	9.7
Persons in family of type:							
Married couple	6.4	7.8	7.7	7.8	7.3	7.8	7.3
Male householder	16.1	15.6	15.6	15.6	16.6	15.3	16.2
Female householder	31.5	27.8	28.1	27.8	28.7	28.0	28.7
Geographic regions:							
Northeast	12.6	14.1	14.1	14.0	14.2	12.0	11.8
Midwest	10.4	10.0	10.0	10.0	10.0	10.8	10.8
South	14.6	13.1	13.3	13.3	13.2	14.8	15.1
West	14.6	16.1	15.9	16.0	16.0	14.4	14.2
Metropolitan area:							
Central city	18.8	18.5	18.5	18.5	18.4	17.2	17.2
Not central city	9.0	10.2	10.2	10.2	10.3	9.7	9.7
Nonmetropolitan area	15.9	13.1	13.2	13.2	13.0	16.5	16.4

^a Child care method based on SIPP.

^b Child care method based on AFDC program allowances.

^c Child care method based on AFDC program allowances and three-parameter equivalence scale.

^d NAS measure with no geographic adjustment.

^e Child care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B1b. **Distribution of the Population: 1997**

	Total population	Poverty population						
		Official measure	Experimental measures					
			NAS	DCM1 ^a	DCM2 ^b	DES-DCM2 ^c	NGA ^d	DES-DCM2-NGA ^e
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Children	26.5	39.7	35.1	35.8	35.3	34.5	34.8	34.3
Nonelderly adults	61.6	50.8	51.4	51.1	51.3	52.0	51.4	52.0
Elderly	12.0	9.5	13.5	13.1	13.4	13.4	18.8	13.7
Unrelated individuals	4.0	6.3	6.2	6.0	6.2	6.8	6.3	6.9
Family members:								
Householder or spouse	7.2	2.9	6.8	6.6	6.8	6.1	7.1	6.3
Other relative	0.8	0.3	0.5	0.5	0.5	0.5	0.5	0.5
White	82.4	68.6	71.4	71.2	71.4	71.2	71.7	71.9
Black	12.8	25.6	22.5	22.8	22.5	22.7	22.5	22.3
Other	4.8	5.8	6.1	6.0	6.1	6.1	5.9	5.7
Hispanic origin ¹	11.4	23.4	23.3	23.4	23.1	22.8	21.4	21.2
No workers	14.2	38.8	36.8	36.2	36.8	36.9	37.3	37.1
One or more workers	85.8	61.2	63.2	63.9	63.2	63.1	62.7	62.9
Persons in family of type:								
Married couple	65.5	31.5	38.3	37.8	38.4	36.0	38.3	36.3
Male householder	11.6	14.1	13.7	13.6	13.7	14.5	13.4	14.2
Female householder	22.9	54.4	48.0	48.6	48.0	49.6	48.3	49.6
Geographic regions:								
Northeast	19.1	18.2	20.3	20.2	20.2	20.4	17.3	16.9
Midwest	23.3	18.3	17.6	17.6	17.5	17.5	18.9	19.0
South	35.1	38.7	34.7	35.2	35.1	34.9	39.2	39.9
West	22.6	24.9	27.4	27.0	27.2	27.2	24.6	24.2
Metropolitan area:								
Central city	29.8	42.2	41.6	41.6	41.5	41.5	38.8	38.8
Not central city	50.7	34.5	39.1	39.1	39.1	39.3	36.9	37.1
Nonmetropolitan area	19.5	23.3	19.3	19.4	19.4	19.2	24.3	24.2

^a Child care method based on SIPP.

^b Child care method based on AFDC program allowances.

^c Child care method based on AFDC program allowances and three-parameter equivalence scale.

^d NAS measure with no geographic adjustment.

^e Child care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B2a. **Poverty Rates: 1997**

	Official measure	Experimental measures					
		NAS/U	DCM1/U ^a	DCM2/U ^b	DES-DCM2/U ^c	NGA/U ^d	DES-DCM2 NGA/U ^e
All persons	13.3	15.4	15.9	15.4	16.1	15.8	16.5
Children	19.9	20.3	21.4	20.5	20.8	21.0	21.5
Nonelderly adults	10.9	12.8	13.2	12.9	13.6	13.1	13.9
Elderly	10.5	17.4	17.4	17.4	18.4	17.9	18.9
Unrelated individuals	21.0	23.9	23.9	23.9	28.2	24.5	28.5
Family members:							
Householder or spouse	5.3	14.5	14.5	14.5	13.9	15.1	14.4
Other relative	6.1	10.3	10.3	10.3	10.2	10.5	11.0
White	11.0	13.4	13.8	13.5	14.1	13.8	14.4
Black	26.5	26.8	27.9	26.8	28.1	27.1	28.9
Other	16.1	18.8	19.2	18.8	19.0	18.5	18.7
Hispanic origin ¹	27.1	31.6	33.0	31.7	32.6	30.2	30.6
No workers	36.3	38.4	38.4	38.4	39.9	39.1	40.6
One or more workers	9.5	11.6	12.2	11.7	12.2	11.9	12.5
Persons in family of type:							
Married couple	6.4	9.4	9.7	9.4	9.3	9.8	9.6
Male householder	16.1	17.5	18.0	17.6	19.6	17.4	19.6
Female householder	31.5	31.4	32.5	31.5	33.7	32.1	34.6
Geographic regions:							
Northeast	12.6	16.2	16.6	16.3	17.1	14.0	14.8
Midwest	10.4	11.6	12.0	11.6	12.2	12.9	13.6
South	14.6	15.3	16.0	15.5	16.2	17.6	18.5
West	14.6	18.6	19.2	18.6	19.3	17.3	17.7
Metropolitan area:							
Central city	18.8	21.2	22.1	21.2	22.2	20.5	21.6
Not central city	9.0	11.9	12.4	12.1	12.5	11.4	11.9
Nonmetropolitan area	15.9	15.4	15.7	15.4	16.0	19.9	20.6

^aChild care method based on SIPP.

^bChild care method based on AFDC program allowances.

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

^dNAS measure with no geographic adjustment.

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B2b. **Distribution of the Population: 1997**

	Total population	Poverty population						
		Official measure	Experimental measures					
			NAS/U	DCM1/U ^a	DCM2/U ^b	DES-DCM2/U ^c	NGA/U ^d	DES-DCM2 NGA/U ^e
All.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Children.....	26.5	39.7	35.1	35.7	35.2	34.2	35.2	34.6
Nonelderly adults.....	61.6	50.8	51.4	51.3	51.4	52.2	51.2	51.8
Elderly.....	12.0	9.5	13.5	13.0	13.4	13.6	13.6	13.7
Unrelated individuals.....	4.0	6.3	6.2	6.0	6.1	6.9	6.2	6.9
Family members:								
Householder or spouse.....	7.2	2.9	6.8	6.6	6.8	6.2	7.0	6.3
Other relative.....	0.8	0.3	0.5	0.5	0.5	0.5	0.5	0.5
White.....	82.4	68.6	71.8	71.7	71.9	71.9	72.3	72.1
Black.....	12.8	25.6	22.4	22.6	22.3	22.4	22.1	22.5
Other.....	4.8	5.8	5.8	5.8	5.8	5.6	5.6	5.4
Hispanic origin ¹	11.4	23.4	23.5	23.7	23.4	23.1	21.9	21.2
No workers.....	14.2	38.8	35.4	34.2	35.2	35.2	35.2	34.9
One or more workers.....	85.8	61.2	64.6	65.8	64.8	64.8	64.8	65.1
Persons in family of type:								
Married couple.....	65.5	31.5	40.0	40.1	40.1	38.0	40.6	38.2
Male householder.....	11.6	14.1	13.2	13.1	13.2	14.1	12.8	13.8
Female householder.....	22.9	54.4	46.8	46.8	46.7	47.9	46.6	48.0
Geographic regions:								
Northeast.....	19.1	18.2	20.1	19.9	20.1	20.3	17.0	17.1
Midwest.....	23.3	18.3	17.6	17.5	17.5	17.6	19.1	19.3
South.....	35.1	38.7	35.0	35.3	35.2	35.2	39.2	39.4
West.....	22.6	24.9	27.3	27.2	27.2	27.0	24.7	24.2
Metropolitan area:								
Central city.....	29.8	42.2	41.2	41.4	41.0	41.2	38.8	39.0
Not central city.....	50.7	34.5	39.3	39.4	39.6	39.4	36.6	36.7
Nonmetropolitan area.....	19.5	23.3	19.5	19.2	19.4	19.4	24.6	24.3

^aChild care method based on SIPP.

^bChild care method based on AFDC program allowances.

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

^dNAS measure with no geographic adjustment.

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B3. Standardized Poverty Rates by Selected Characteristics: 1997

	Number (1,000)	Official measure	Experimental measures (standardized to match the official rate)						
			NAS	DCM1 ^a	DCM2 ^b	DES-DCM2 ^c	NGA ^d	DES-DCM2-NGA ^e	
All persons	268,480	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Age groups:									
Less than 3 years	11,546	21.2	20.1	20.6	20.2	19.7	20.0	20.0	20.0
3 to 5 years	12,051	22.8	21.4	21.3	21.5	21.0	21.0	21.0	21.1
6 to 11 years	23,997	20.3	17.4	17.8	17.5	17.1	17.0	17.0	16.6
12 to 17 years	23,475	17.2	14.7	14.9	14.7	14.5	14.7	14.7	14.4
18 to 21 years	14,816	18.2	18.3	18.5	18.2	18.8	18.4	18.4	19.0
22 to 44 years	94,201	11.4	11.4	11.4	11.4	11.6	11.3	11.3	11.5
45 to 54 years	34,057	7.2	7.6	7.4	7.6	7.6	7.5	7.5	7.5
55 to 59 years	12,190	9.0	9.4	9.1	9.3	9.3	9.6	9.6	9.5
60 to 64 years	10,065	11.2	11.1	10.8	11.1	11.1	11.4	11.4	11.4
65 to 74 years	17,874	9.2	12.7	12.3	12.6	12.7	13.0	13.0	12.9
75+ years	14,209	12.2	17.9	17.3	17.8	17.6	18.2	18.2	18.0
Race/origin:									
White, not Hispanic	191,859	8.6	9.1	9.1	9.2	9.2	9.5	9.5	9.6
White, Hispanic	29,341	26.9	27.0	27.0	26.8	26.4	24.9	24.9	24.6
Black, not Hispanic	33,631	26.3	23.1	23.4	23.0	23.3	23.2	23.2	23.0
Black, Hispanic	827	32.7	29.8	30.4	29.8	29.3	23.6	23.6	24.9
Other, not Hispanic	12,352	15.6	16.6	16.3	16.6	16.6	15.9	15.9	15.6
Other, Hispanic ¹	469	28.3	26.0	27.5	26.0	26.5	25.6	25.6	25.6
Number of persons in family:									
1 person	41,672	20.9	18.8	18.4	18.7	20.3	18.7	18.7	20.2
2 persons	62,073	8.3	11.0	11.2	11.1	10.6	11.3	11.3	10.9
3 persons	50,433	10.9	11.4	11.4	11.2	11.8	11.4	11.4	12.0
4 persons	59,408	10.4	10.0	9.9	10.0	9.9	10.1	10.1	10.0
5 persons	33,347	14.2	13.7	14.1	13.9	13.2	13.6	13.6	12.9
6 persons	12,623	20.7	18.9	19.0	18.8	17.8	18.8	18.8	18.2
7 persons	5,055	29.1	23.8	24.3	23.8	21.4	24.5	24.5	22.4
8 persons	2,160	27.3	23.8	23.8	25.0	22.1	22.7	22.7	18.1
9 persons	788	35.9	24.6	24.6	22.0	22.0	20.1	20.1	20.1
10+ persons	922	45.9	41.1	41.9	41.1	35.4	23.9	23.9	19.2
Marital status:									
Married, spouse present	110,619	5.3	7.3	7.2	7.3	6.8	7.4	7.4	7.0
Married, spouse absent	2,424	20.6	21.2	20.7	21.2	21.4	20.6	20.6	21.4
Widowed	13,599	17.6	18.5	18.1	18.4	19.9	18.9	18.9	20.1
Divorced	24,346	19.7	17.3	17.4	17.3	18.3	17.6	17.6	18.4
Never married	117,493	18.8	17.2	17.4	17.2	17.3	17.0	17.0	17.2
Gender:									
Male	131,376	11.6	11.9	11.9	11.9	11.8	11.9	11.9	11.8
Female	137,105	14.9	14.5	14.5	14.5	14.6	14.6	14.6	14.7
Education (25 years of age and over):									
No high school diploma	29,558	24.5	24.5	24.1	24.4	24.4	25.0	25.0	24.8
High school diploma	58,174	9.9	11.0	10.9	11.0	11.1	11.1	11.1	11.1
Some college	42,506	6.5	7.5	7.4	7.5	7.6	7.4	7.4	7.6
College degree	41,974	3.1	4.2	4.1	4.2	4.3	4.0	4.0	4.1
Citizenship status:									
Native	242,219	12.5	12.2	12.3	12.3	12.3	12.5	12.5	12.6
Naturalized citizen	9,732	11.4	13.4	13.3	13.4	13.4	12.1	12.1	12.1
Not a citizen	16,529	25.0	28.0	27.6	27.8	27.5	24.7	24.7	24.2
Disability status:									
Not disabled	153,248	9.4	10.1	10.1	10.1	10.2	10.0	10.0	10.1
Disabled	20,017	25.3	19.9	19.4	19.9	20.3	20.8	20.8	21.1
Severe disability	14,649	29.1	22.1	21.6	22.1	22.7	23.1	23.1	23.6
Self-reported health status:									
Excellent	91,976	9.7	9.9	10.1	9.9	9.9	9.8	9.8	9.9
Very good	81,855	11.5	11.7	11.7	11.7	11.7	11.5	11.5	11.5
Good	63,804	15.8	15.9	15.8	15.9	15.9	16.0	16.0	15.8
Fair	21,252	21.0	20.8	20.6	20.6	20.7	21.2	21.2	21.3
Poor	9,594	27.7	24.3	23.6	24.2	24.6	25.5	25.5	25.9

^aChild care method based on SIPP.

^bChild care method based on AFDC program allowances.

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

^dNAS measure with no geographic adjustment.

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B4. Poverty Rates by Selected Characteristics: 1997

	Official measure	Experimental measures					
		NAS/U	DCM1/U ^a	DCM2/U ^b	DES-DCM2/U ^c	NGA/U ^d	DES-DCM2-NGA/U ^e
All persons.....	13.3	15.4	15.9	15.4	16.1	15.8	16.5
Age groups:							
Less than 3 years.....	21.2	23.5	24.9	23.9	24.3	24.2	25.0
3 to 5 years.....	22.8	24.7	25.9	24.9	25.1	25.6	26.4
6 to 11 years.....	20.3	20.0	21.3	20.3	20.5	20.6	21.2
12 to 17 years.....	17.2	16.8	17.5	16.9	17.1	17.3	17.8
18 to 21 years.....	18.2	20.5	21.1	20.7	22.1	21.0	22.2
22 to 44 years.....	11.4	13.4	13.9	13.4	14.2	13.6	14.5
45 to 54 years.....	7.2	8.7	8.9	8.8	9.2	8.8	9.4
55 to 59 years.....	9.0	10.8	10.9	10.8	11.5	11.2	11.5
60 to 64 years.....	11.2	12.8	12.9	12.8	13.2	13.3	13.9
65 to 74 years.....	9.2	14.8	14.8	14.8	15.5	15.4	16.0
75+ years.....	12.2	20.6	20.6	20.6	22.0	21.1	22.5
Race/origin:							
White, not Hispanic.....	8.6	10.6	10.9	10.7	11.2	11.3	12.0
White, Hispanic.....	26.9	31.5	33.0	31.7	32.5	30.2	30.7
Black, not Hispanic.....	26.3	26.6	27.7	26.7	28.0	27.1	28.8
Black, Hispanic.....	32.7	33.9	36.7	33.9	34.4	28.7	29.7
Other, not Hispanic.....	15.6	18.4	18.7	18.4	18.4	18.2	18.3
Other, Hispanic ¹	28.3	29.2	30.8	29.2	34.1	28.1	29.8
Number of persons in family:							
1 person.....	20.9	21.2	21.2	21.2	24.0	21.4	24.2
2 persons.....	8.3	12.7	13.2	12.8	12.7	13.3	13.2
3 persons.....	10.9	13.3	14.1	13.4	15.0	13.6	15.3
4 persons.....	10.4	11.7	12.4	11.8	12.2	12.1	12.4
5 persons.....	14.2	16.1	16.7	16.2	15.9	16.9	16.8
6 persons.....	20.7	22.0	22.8	22.3	21.2	22.3	22.0
7 persons.....	29.1	27.8	28.9	28.1	26.9	28.2	27.5
8 persons.....	27.3	27.2	29.5	28.4	26.7	27.9	29.1
9 persons.....	35.9	31.9	33.3	31.9	28.4	26.2	23.6
10+ persons.....	45.9	46.0	46.0	46.0	41.5	46.6	37.6
Marital status:							
Married, spouse present.....	5.3	8.8	9.1	8.9	8.7	9.2	9.0
Married, spouse absent.....	20.6	22.8	23.2	22.9	25.4	22.6	24.7
Widowed.....	17.6	21.4	21.4	21.4	23.9	22.1	24.7
Divorced.....	19.7	20.0	20.5	20.0	22.0	20.4	22.8
Never married.....	18.8	19.7	20.6	19.9	20.7	20.1	21.1
Gender:							
Male.....	11.6	13.9	14.4	14.0	14.5	14.2	14.9
Female.....	14.9	16.8	17.3	16.9	17.6	17.2	18.1
Education (25 years of age and over):							
No high school diploma.....	24.5	28.6	29.0	28.6	30.2	29.8	31.2
High school diploma.....	9.9	13.0	13.3	13.1	13.7	13.2	14.0
Some college.....	6.5	8.8	9.1	8.8	9.5	9.0	9.6
College degree.....	3.1	4.8	4.9	4.8	5.0	4.5	4.8
Citizenship status:							
Native.....	12.5	14.2	14.7	14.3	14.9	14.9	15.6
Naturalized citizen.....	11.4	16.1	16.7	16.2	17.1	14.5	15.3
Not a citizen.....	25.0	31.7	32.9	31.8	32.7	28.8	29.6
Disability status:							
Not disabled.....	9.4	11.6	12.1	11.7	12.3	11.8	12.4
Disabled.....	25.3	23.5	23.7	23.5	25.1	24.8	26.2
Severe disability.....	29.1	26.4	26.5	26.4	28.4	27.8	29.4
Self-reported health status:							
Excellent.....	9.7	11.5	12.1	11.5	11.9	11.5	12.1
Very good.....	11.5	13.4	14.0	13.6	14.2	14.0	14.5
Good.....	15.8	18.6	19.1	18.7	19.4	18.9	20.0
Fair.....	21.0	24.1	24.6	24.1	25.4	25.0	26.3
Poor.....	27.7	28.3	28.4	28.2	30.3	30.3	31.7

^aChild care method based on SIPP.

^bChild care method based on AFDC program allowances.

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

^dNAS measure with no geographic adjustment.

^eChild care method based on AFDC program allowances, three-parameter scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997**

Table B5a. **Official Poverty Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.5	14.2	14.8	15.1	14.6	13.8	13.7	13.3
Children	20.7	21.8	22.4	22.7	21.8	20.8	20.5	19.9
Nonelderly adults	10.8	11.4	11.9	12.4	11.9	11.4	11.4	10.9
Elderly	12.2	12.4	12.9	12.2	11.7	10.5	10.8	10.5
Unrelated individuals	24.7	24.9	24.9	24.1	23.1	21.4	20.9	21.0
Family members:								
Householder or spouse	5.9	5.9	7.1	6.4	5.8	4.7	5.3	5.3
Other relative	5.8	7.0	7.6	7.4	8.4	7.9	8.7	6.1
White	10.7	11.3	11.9	12.2	11.7	11.2	11.2	11.0
Black	31.9	32.7	33.4	33.1	30.6	29.3	28.4	26.5
Other	15.4	17.6	17.4	18.9	21.1	17.8	17.6	16.1
Hispanic origin ¹	28.1	28.7	29.6	30.6	30.7	30.3	29.4	27.1
No workers	40.2	40.5	42.0	42.4	40.7	38.2	38.1	36.3
One or more workers	8.9	9.5	10.0	10.2	9.9	9.6	9.6	9.5
Persons in family of type:								
Married couple	6.9	7.2	7.7	8.0	7.4	6.8	6.9	6.4
Male householder	15.5	16.3	17.9	18.0	18.3	16.9	16.2	16.1
Female householder	33.1	34.8	34.9	34.8	34.2	32.4	32.0	31.5
Geographic regions:								
Northeast	11.4	12.2	12.6	13.3	12.9	12.5	12.7	12.6
Midwest	12.5	13.2	13.3	13.4	13.0	11.0	10.7	10.4
South	15.8	16.1	17.1	17.2	16.1	15.7	15.1	14.6
West	13.0	14.3	14.9	15.6	15.3	14.9	15.4	14.6
Metropolitan area:								
Central city	19.0	20.2	20.9	21.5	20.9	20.6	19.6	18.8
Not central city	8.7	9.6	9.9	10.3	10.3	9.1	9.4	9.0
Nonmetropolitan area	16.3	16.1	16.9	17.2	16.0	15.6	15.9	15.9

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5b. **NAS Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.3	14.9	15.6	16.5	15.3	14.3	13.7	13.3
Children	19.9	21.0	21.6	22.5	20.7	19.1	18.0	17.6
Nonelderly adults	11.7	12.2	12.7	13.7	12.7	12.0	11.4	11.1
Elderly	15.3	15.7	16.9	17.6	16.8	15.6	15.8	15.0
Unrelated individuals	21.7	21.9	22.5	24.3	22.8	21.5	20.9	20.8
Family members:								
Householder or spouse	12.3	12.7	14.5	14.8	13.9	12.9	13.2	12.5
Other relative	10.2	11.2	12.2	10.5	12.1	10.5	12.5	8.9
White	12.2	12.7	13.1	14.0	13.1	12.3	11.9	11.5
Black	27.8	29.0	31.1	31.3	27.0	26.0	24.4	23.3
Other	16.3	18.4	18.2	21.4	22.0	18.5	16.8	17.0
Hispanic origin ¹	32.0	33.3	33.0	34.2	32.9	30.8	29.5	27.0
No workers	36.2	36.8	39.6	40.2	39.0	36.6	36.0	34.4
One or more workers	10.4	11.0	11.3	12.2	11.1	10.5	10.0	9.8
Persons in family of type:								
Married couple	8.9	9.2	9.7	10.4	9.3	8.6	8.2	7.8
Male householder	16.2	16.9	18.1	19.4	18.4	17.6	16.0	15.6
Female householder	30.2	31.5	32.0	33.0	31.9	29.1	28.3	27.8
Geographic regions:								
Northeast	13.3	14.1	15.1	16.1	14.9	14.8	14.3	14.1
Midwest	12.7	12.6	13.2	14.1	12.9	11.1	10.1	10.0
South	14.9	15.6	16.5	17.0	15.2	14.6	13.9	13.1
West	15.8	17.2	17.0	18.7	18.4	16.8	16.6	16.1
Metropolitan area:								
Central city	19.6	20.9	21.8	23.0	21.0	20.8	19.1	18.5
Not central city	10.7	11.3	11.7	12.5	12.2	10.8	10.7	10.2
Nonmetropolitan area	14.7	14.6	15.3	16.2	14.7	13.5	13.2	13.1

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5c. **DCM1^a Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.1	14.8	15.5	16.4	15.2	14.3	13.8	13.3
Children	19.9	21.0	21.7	22.6	20.7	19.3	18.6	17.9
Nonelderly adults	11.5	12.1	12.6	13.6	12.5	12.0	11.5	11.0
Elderly	14.9	15.3	16.5	17.1	16.3	15.1	15.4	14.5
Unrelated individuals	21.1	21.4	21.9	23.7	22.1	20.7	20.4	20.2
Family members:								
Householder or spouse	11.9	12.4	14.0	14.3	13.6	12.5	12.9	12.1
Other relative	10.1	11.2	12.0	10.2	11.8	10.0	12.7	8.4
White	12.0	12.5	13.0	13.8	13.0	12.2	11.9	11.5
Black	27.8	29.1	31.0	31.6	27.1	26.2	25.3	23.5
Other	16.3	18.1	18.4	21.9	22.0	18.8	16.7	16.7
Hispanic origin ¹	31.8	32.9	33.0	33.8	32.6	30.7	29.6	27.1
No workers	35.4	36.0	38.6	39.3	38.1	35.7	35.2	33.8
One or more workers	10.5	11.0	11.4	12.2	11.1	10.6	10.3	9.9
Persons in family of type:								
Married couple	8.7	9.1	9.7	10.3	9.1	8.5	8.2	7.7
Male householder	16.2	16.6	18.0	19.4	18.2	17.5	16.3	15.6
Female householder	30.1	31.5	31.9	33.0	31.7	29.2	28.7	28.1
Geographic regions:								
Northeast	13.0	13.9	14.9	16.0	14.9	14.7	14.3	14.1
Midwest	12.6	12.6	13.2	13.8	13.0	11.1	10.4	10.0
South	15.0	15.5	16.6	16.9	15.0	14.6	14.3	13.3
West	15.6	17.1	16.8	18.7	18.0	16.8	16.4	15.9
Metropolitan area:								
Central city	19.4	20.7	21.6	22.8	21.0	20.7	19.3	18.5
Not central city	10.5	11.3	11.6	12.6	12.0	10.8	10.8	10.2
Nonmetropolitan area	14.8	14.5	15.3	15.9	14.5	13.4	13.3	13.2

^aChild care method based on SIPP.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5d. **DCM2^b Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.2	14.9	15.5	16.5	15.3	14.3	13.8	13.3
Children	19.8	21.0	21.6	22.5	20.7	19.1	18.3	17.7
Nonelderly adults	11.6	12.2	12.6	13.6	12.7	12.0	11.5	11.0
Elderly	15.2	15.6	16.8	17.5	16.6	15.5	15.6	14.9
Unrelated individuals	21.6	21.8	22.3	24.2	22.6	21.4	20.7	20.7
Family members:								
Householder or spouse	12.2	12.6	14.3	14.7	13.8	12.8	13.1	12.4
Other relative	10.2	11.2	12.2	10.4	11.6	10.5	12.6	8.9
White	12.1	12.7	13.0	13.9	13.1	12.3	11.9	11.5
Black	27.8	28.8	30.9	31.3	27.1	26.0	24.6	23.2
Other	15.9	18.5	18.5	21.5	22.0	18.7	16.8	16.9
Hispanic origin ¹	31.8	33.1	32.8	34.0	32.6	31.0	29.6	26.9
No workers	36.0	36.6	39.4	40.0	38.8	36.4	35.8	34.4
One or more workers	10.4	11.0	11.3	12.2	11.1	10.5	10.1	9.8
Persons in family of type:								
Married couple	8.8	9.2	9.7	10.5	9.3	8.6	8.2	7.8
Male householder	16.1	16.8	18.1	19.3	18.3	17.6	16.0	15.6
Female householder	30.1	31.3	31.9	32.8	31.7	29.2	28.5	27.8
Geographic regions:								
Northeast	13.1	14.1	15.0	16.1	14.9	14.8	14.3	14.0
Midwest	12.7	12.6	13.2	14.0	12.9	11.1	10.2	10.0
South	15.0	15.6	16.6	16.9	15.2	14.7	14.1	13.3
West	15.7	17.2	16.9	18.7	18.2	16.8	16.6	16.0
Metropolitan area:								
Central city	19.6	20.8	21.7	22.9	20.9	20.8	19.3	18.5
Not central city	10.5	11.3	11.7	12.6	12.2	10.8	10.7	10.2
Nonmetropolitan area	14.7	14.6	15.3	16.0	14.8	13.6	13.4	13.2

^bChild care method based on AFDC program allowances.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5e. **DES-DCM2^c Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.2	14.8	15.6	16.4	15.2	14.4	13.8	13.3
Children	19.3	20.4	21.3	22.0	20.3	18.7	17.8	17.3
Nonelderly adults	11.7	12.2	12.9	13.8	12.8	12.2	11.6	11.2
Elderly	15.4	15.7	17.0	17.5	16.5	15.9	15.8	14.9
Unrelated individuals	24.0	24.5	25.2	26.8	24.4	24.3	23.1	22.9
Family members:								
Householder or spouse	11.2	11.4	13.2	13.3	12.6	11.8	12.1	11.2
Other relative	9.9	10.5	11.6	10.4	11.3	10.3	12.0	8.6
White	12.1	12.6	13.1	13.9	13.0	12.3	11.9	11.5
Black	27.9	28.7	31.0	31.4	27.3	26.4	24.9	23.5
Other	16.0	18.1	18.5	21.7	21.8	18.4	16.6	16.9
Hispanic origin ¹	31.7	32.5	32.7	33.7	32.0	30.7	28.9	26.5
No workers	36.5	36.9	39.5	40.4	38.8	37.1	36.3	34.5
One or more workers	10.3	10.9	11.3	12.1	11.1	10.5	10.0	9.8
Persons in family of type:								
Married couple	8.3	8.6	9.3	9.9	8.8	8.1	7.7	7.3
Male householder	17.1	17.9	19.3	20.5	19.3	18.6	17.0	16.6
Female householder	31.1	32.3	33.1	33.7	32.5	30.4	29.5	28.7
Geographic regions:								
Northeast	13.0	14.1	15.0	15.9	15.0	15.0	14.3	14.2
Midwest	12.6	12.6	13.2	13.9	13.0	11.1	10.1	10.0
South	14.9	15.5	16.7	17.0	15.1	14.6	14.1	13.2
West	15.8	16.7	17.1	18.7	18.1	16.9	16.6	16.0
Metropolitan area:								
Central city	19.7	20.9	21.8	22.9	21.1	21.1	19.3	18.4
Not central city	10.5	11.1	11.8	12.5	12.0	10.8	10.6	10.3
Nonmetropolitan area	14.4	14.4	15.3	16.0	14.7	13.4	13.5	13.0

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5f. **NGA^d Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.4	15.1	15.7	16.5	15.3	14.5	13.7	13.3
Children	20.0	20.9	21.6	22.4	20.8	19.2	18.0	17.4
Nonelderly adults	11.8	12.3	12.8	13.6	12.7	12.1	11.4	11.1
Elderly	15.5	16.2	17.4	17.7	16.9	15.8	15.7	15.3
Unrelated individuals	22.1	22.6	23.1	24.8	22.8	22.1	20.7	20.9
Family members:								
Householder or spouse	12.5	13.1	14.9	14.8	14.1	12.9	13.3	13.0
Other relative	10.1	11.3	11.7	10.1	12.1	10.4	11.9	8.7
White	12.3	12.9	13.3	14.0	13.2	12.5	11.9	11.5
Black	28.5	28.8	31.1	31.4	27.3	25.9	24.6	23.2
Other	14.4	17.9	17.4	20.4	20.4	17.7	15.3	16.3
Hispanic origin ¹	28.2	29.4	29.6	30.6	29.8	29.6	26.3	24.9
No workers	35.9	36.6	39.2	40.2	38.5	36.3	35.8	34.9
One or more workers	10.7	11.2	11.5	12.1	11.2	10.7	10.0	9.7
Persons in family of type:								
Married couple	9.1	9.5	10.1	10.5	9.5	8.8	8.2	7.8
Male householder	16.2	17.1	17.9	18.9	18.0	17.6	15.9	15.3
Female householder	30.1	31.1	31.9	32.9	31.4	29.0	28.4	28.0
Geographic regions:								
Northeast	10.9	11.7	12.5	13.4	12.6	12.6	12.2	12.0
Midwest	13.8	13.8	14.6	15.1	13.9	12.2	11.3	10.8
South	17.2	17.8	18.7	19.1	17.3	16.5	15.7	14.8
West	13.9	15.3	15.1	16.5	16.3	15.3	14.4	14.4
Metropolitan area:								
Central city	18.3	19.5	20.4	21.5	19.8	19.5	17.7	17.2
Not central city	9.8	10.7	11.1	11.7	11.5	10.2	10.0	9.7
Nonmetropolitan area	18.9	18.6	19.2	19.9	18.5	17.7	17.1	16.5

^dNAS measure with no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B5. **Poverty Rates Standardized to Match the Official Rate for All Persons in 1997 With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B5g. **DES-DCM2-NGA^e Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	14.3	15.0	15.7	16.4	15.1	14.4	13.6	13.3
Children	19.4	20.5	21.1	22.0	20.0	18.8	17.5	17.2
Nonelderly adults	11.9	12.4	12.9	13.7	12.7	12.1	11.5	11.2
Elderly	15.7	16.2	17.7	17.6	16.9	15.9	15.9	15.2
Unrelated individuals	24.9	24.9	26.1	27.0	25.2	24.5	23.1	22.9
Family members:								
Householder or spouse	11.3	12.0	13.9	13.4	12.8	11.8	12.4	11.6
Other relative	9.5	10.3	11.8	9.9	11.5	9.6	11.2	8.6
White	12.2	12.8	13.2	13.9	13.1	12.4	11.8	11.6
Black	28.2	29.1	30.8	31.5	26.9	26.0	24.8	23.1
Other	14.7	17.2	17.5	20.2	20.1	17.4	15.6	15.9
Hispanic origin ¹	27.8	28.8	29.0	29.6	29.0	28.7	25.7	24.6
No workers	36.0	36.6	39.5	40.0	38.5	36.2	35.9	34.7
One or more workers	10.6	11.1	11.4	12.1	11.0	10.6	9.9	9.7
Persons in family of type:								
Married couple	8.6	8.9	9.4	9.9	8.8	8.3	7.6	7.3
Male householder	16.9	18.1	19.1	20.0	19.1	18.4	16.8	16.2
Female householder	31.0	32.0	32.9	33.8	32.1	29.9	29.4	28.7
Geographic regions:								
Northeast	10.7	11.7	12.4	13.4	12.7	12.4	12.4	11.8
Midwest	13.7	13.9	14.5	15.1	13.8	12.2	11.2	10.8
South	17.2	17.7	18.8	19.2	16.9	16.5	15.6	15.1
West	13.9	15.0	15.0	16.2	15.9	15.0	14.2	14.2
Metropolitan area:								
Central city	18.3	19.6	20.2	21.5	19.5	19.6	18.0	17.2
Not central city	9.8	10.6	11.1	11.7	11.3	10.1	9.8	9.7
Nonmetropolitan area	18.7	18.1	19.2	19.8	18.2	17.4	16.9	16.4

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997**

Table B6a. **Official Poverty Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.5	14.2	14.8	15.1	14.6	13.8	13.7	13.3
Children	20.7	21.8	22.4	22.7	21.8	20.8	20.5	19.9
Nonelderly adults	10.8	11.4	11.9	12.4	11.9	11.4	11.4	10.9
Elderly	12.2	12.4	12.9	12.2	11.7	10.5	10.8	10.5
Unrelated individuals	24.7	24.9	24.9	24.1	23.1	21.4	20.9	21.0
Family members:								
Householder or spouse	5.9	5.9	7.1	6.4	5.8	4.7	5.3	5.3
Other relative	5.8	7.0	7.6	7.4	8.4	7.9	8.7	6.1
White	10.7	11.3	11.9	12.2	11.7	11.2	11.2	11.0
Black	31.9	32.7	33.4	33.1	30.6	29.3	28.4	26.5
Other	15.4	17.6	17.4	18.9	21.1	17.8	17.6	16.1
Hispanic origin ¹	28.1	28.7	29.6	30.6	30.7	30.3	29.4	27.1
No workers	40.2	40.5	42.0	42.4	40.7	38.2	38.1	36.3
One or more workers	8.9	9.5	10.0	10.2	9.9	9.6	9.6	9.5
Persons in family of type:								
Married couple	6.9	7.2	7.7	8.0	7.4	6.8	6.9	6.4
Male householder	15.5	16.3	17.9	18.0	18.3	16.9	16.2	16.1
Female householder	33.1	34.8	34.9	34.8	34.2	32.4	32.0	31.5
Geographic regions:								
Northeast	11.4	12.2	12.6	13.3	12.9	12.5	12.7	12.6
Midwest	12.5	13.2	13.3	13.4	13.0	11.0	10.7	10.4
South	15.8	16.1	17.1	17.2	16.1	15.7	15.1	14.6
West	13.0	14.3	14.9	15.6	15.3	14.9	15.4	14.6
Metropolitan area:								
Central city	19.0	20.2	20.9	21.5	20.9	20.6	19.6	18.8
Not central city	8.7	9.6	9.9	10.3	10.3	9.1	9.4	9.0
Nonmetropolitan area	16.3	16.1	16.9	17.2	16.0	15.6	15.9	15.9

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B6b. **NAS/U Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.8	17.5	18.2	19.1	17.8	16.9	16.2	15.4
Children	23.5	24.6	24.9	25.9	23.8	22.5	21.4	20.3
Nonelderly adults	13.7	14.3	14.9	15.8	14.8	14.2	13.5	12.8
Elderly	17.8	18.6	20.3	20.6	19.5	18.3	18.4	17.4
Unrelated individuals	25.3	25.9	26.8	28.4	25.9	25.6	24.3	23.9
Family members:								
Householder or spouse	14.4	15.1	17.3	17.2	16.4	14.8	15.7	14.5
Other relative	11.2	13.2	14.7	13.9	14.5	13.3	13.7	10.3
White	14.2	14.9	15.4	16.2	15.3	14.6	14.1	13.4
Black	33.2	34.1	35.0	35.8	31.2	30.3	28.8	26.8
Other	19.4	21.5	22.4	25.0	25.2	21.5	19.5	18.8
Hispanic origin ¹	37.0	38.4	38.3	39.5	37.3	36.9	34.7	31.6
No workers	41.0	41.5	44.0	44.7	43.1	41.0	40.4	38.4
One or more workers	12.6	13.2	13.6	14.4	13.3	12.8	12.1	11.6
Persons in family of type:								
Married couple	10.7	11.1	12.0	12.4	11.3	10.7	10.1	9.4
Male householder	18.5	19.5	20.7	21.7	20.9	19.8	18.4	17.5
Female householder	34.9	36.2	35.8	37.3	35.5	33.4	32.6	31.4
Geographic regions:								
Northeast	15.5	16.5	17.6	18.6	17.5	17.6	17.1	16.2
Midwest	14.7	14.9	15.6	16.1	14.8	12.9	12.4	11.6
South	17.8	18.5	19.3	19.6	17.9	17.2	16.3	15.3
West	18.6	19.9	19.8	21.8	21.0	20.0	19.3	18.6
Metropolitan area:								
Central city	23.0	24.1	25.2	26.2	24.3	24.1	22.5	21.2
Not central city	12.4	13.4	13.7	14.7	14.2	12.9	12.7	11.9
Nonmetropolitan area	17.7	17.5	18.1	18.8	17.2	16.2	15.6	15.4

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997**—Con.

Table B6c. **DCM1/U^a Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	17.1	17.9	18.6	19.5	18.3	17.4	16.8	15.9
Children	24.2	25.3	25.8	26.7	24.8	23.6	22.6	21.4
Nonelderly adults	14.0	14.6	15.2	16.1	15.2	14.6	13.9	13.2
Elderly	17.8	18.6	20.3	20.6	19.5	18.3	18.5	17.4
Unrelated individuals	25.3	25.9	26.8	28.4	25.9	25.6	24.3	23.9
Family members:								
Householder or spouse	14.4	15.1	17.3	17.2	16.4	14.8	15.7	14.5
Other relative	11.2	13.3	15.0	13.9	14.6	13.4	14.0	10.3
White	14.5	15.2	15.8	16.5	15.7	15.1	14.4	13.8
Black	33.7	34.9	35.8	37.0	32.2	31.1	30.4	27.9
Other	19.6	22.2	22.7	25.3	25.8	22.3	20.5	19.2
Hispanic origin ¹	37.7	39.1	39.2	40.1	38.2	38.1	35.9	33.0
No workers	41.0	41.5	44.0	44.7	43.1	41.0	40.4	38.4
One or more workers	13.0	13.7	14.1	14.8	13.9	13.4	12.8	12.2
Persons in family of type:								
Married couple	10.9	11.4	12.2	12.7	11.7	11.0	10.4	9.7
Male householder	18.6	19.4	20.9	22.0	21.2	20.2	18.9	18.0
Female householder	35.7	37.0	36.9	38.3	36.5	34.6	33.9	32.5
Geographic regions:								
Northeast	15.9	16.7	17.9	18.9	18.0	18.2	17.6	16.6
Midwest	14.9	15.4	16.1	16.5	15.4	13.3	12.7	12.0
South	18.4	18.9	19.7	20.2	18.4	17.8	17.1	16.0
West	18.8	20.2	20.3	22.0	21.3	20.7	19.7	19.2
Metropolitan area:								
Central city	23.4	24.4	25.7	26.7	24.8	24.7	23.4	22.1
Not central city	12.7	13.7	14.1	15.0	14.6	13.4	13.1	12.4
Nonmetropolitan area	18.0	17.9	18.6	19.2	17.8	16.7	16.2	15.7

^aChild care method based on SIPP.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B6d. **DCM2/U^b Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.8	17.6	18.3	19.1	17.9	17.0	16.3	15.4
Children	23.5	24.7	25.1	26.1	24.0	22.8	21.6	20.5
Nonelderly adults	13.7	14.4	14.9	15.8	14.9	14.3	13.6	12.9
Elderly	17.8	18.6	20.3	20.6	19.5	18.3	18.4	17.4
Unrelated individuals	25.3	25.9	26.8	28.4	25.9	25.6	24.3	23.9
Family members:								
Householder or spouse	14.4	15.1	17.3	17.1	16.4	14.8	15.7	14.5
Other relative	11.3	13.3	14.7	13.9	14.5	13.3	13.7	10.3
White	14.2	14.9	15.5	16.3	15.4	14.7	14.1	13.5
Black	33.1	34.2	35.2	35.9	31.4	30.5	28.9	26.8
Other	19.4	21.6	22.5	25.1	25.4	21.7	19.4	18.8
Hispanic origin ¹	37.1	38.3	38.3	39.4	37.4	37.1	34.9	31.7
No workers	41.0	41.5	44.0	44.7	43.1	41.0	40.4	38.4
One or more workers	12.6	13.3	13.7	14.5	13.4	12.9	12.2	11.7
Persons in family of type:								
Married couple	10.8	11.2	12.0	12.5	11.4	10.7	10.1	9.4
Male householder	18.4	19.3	20.8	21.8	20.8	20.0	18.5	17.6
Female householder	34.8	36.2	36.1	37.4	35.7	33.7	32.8	31.5
Geographic regions:								
Northeast	15.5	16.5	17.6	18.7	17.7	17.8	17.1	16.3
Midwest	14.7	15.0	15.6	16.1	15.0	13.0	12.5	11.6
South	17.8	18.6	19.3	19.7	17.9	17.4	16.4	15.5
West	18.6	20.0	20.0	21.9	21.1	20.0	19.4	18.6
Metropolitan area:								
Central city	23.0	24.1	25.2	26.2	24.4	24.2	22.6	21.2
Not central city	12.4	13.5	13.8	14.8	14.3	13.0	12.7	12.1
Nonmetropolitan area	17.7	17.6	18.2	18.9	17.3	16.5	15.7	15.4

^bChild care method based on AFDC program allowances.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B6e. **DES-DCM2/U^c Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	17.5	18.2	19.0	19.9	18.5	17.7	17.0	16.1
Children	23.9	25.1	25.6	26.6	24.3	23.2	22.1	20.8
Nonelderly adults	14.5	15.0	15.7	16.7	15.5	14.9	14.4	13.6
Elderly	18.9	19.7	21.0	21.6	20.2	19.3	19.3	18.4
Unrelated individuals	29.7	30.5	31.3	32.9	30.2	30.0	28.5	28.2
Family members:								
Householder or spouse	13.6	14.3	16.1	16.3	15.3	14.1	14.7	13.9
Other relative	12.6	13.3	15.3	14.6	14.3	12.5	14.0	10.2
White	14.9	15.5	16.1	17.0	15.9	15.3	14.8	14.1
Black	34.2	35.4	36.8	37.4	32.5	31.7	30.3	28.1
Other	20.3	22.1	23.2	25.4	25.9	22.0	20.4	19.0
Hispanic origin ¹	38.0	39.1	39.3	40.6	38.7	37.9	35.7	32.6
No workers	42.7	43.0	45.5	46.1	44.4	42.6	42.0	39.9
One or more workers	13.1	13.8	14.3	15.1	13.9	13.4	12.8	12.2
Persons in family of type:								
Married couple	10.7	11.1	11.9	12.5	11.2	10.6	10.0	9.3
Male householder	20.3	21.6	22.8	23.8	23.0	21.8	20.6	19.6
Female householder	37.3	38.5	38.7	39.9	38.0	36.0	35.2	33.7
Geographic regions:								
Northeast	16.3	17.2	18.3	19.4	18.3	18.3	18.0	17.1
Midwest	15.4	15.8	16.3	16.9	15.5	13.5	13.0	12.2
South	18.5	19.1	20.2	20.7	18.4	18.1	17.1	16.2
West	19.3	20.5	20.7	22.4	21.8	20.8	20.2	19.3
Metropolitan area:								
Central city	24.1	25.1	26.3	27.4	25.2	25.1	23.8	22.2
Not central city	12.8	14.0	14.4	15.4	14.7	13.5	13.3	12.5
Nonmetropolitan area	18.4	17.9	18.9	19.7	17.8	17.2	16.4	16.0

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997**—Con.

Table B6f. **NGA/U^d Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	17.4	17.9	18.7	19.4	18.1	17.3	16.4	15.8
Children	24.3	24.9	25.7	26.3	24.4	23.0	21.6	21.0
Nonelderly adults	14.2	14.6	15.2	16.0	15.0	14.4	13.7	13.1
Elderly	18.9	19.2	21.1	21.2	20.0	19.4	19.0	17.9
Unrelated individuals	26.7	26.7	28.2	29.0	26.9	26.4	24.8	24.5
Family members:								
Householder or spouse	15.3	15.7	17.8	17.9	16.7	16.0	16.3	15.1
Other relative	11.7	13.3	15.4	13.2	13.9	14.3	13.3	10.5
White	14.9	15.3	15.9	16.7	15.8	15.1	14.4	13.8
Black	33.9	34.1	36.1	35.5	31.4	30.4	29.2	27.1
Other	18.6	20.5	21.6	23.2	24.1	20.7	18.4	18.5
Hispanic origin ¹	34.3	34.7	35.0	36.1	35.1	34.8	32.1	30.2
No workers	41.5	41.5	44.5	45.1	43.1	41.7	40.8	39.1
One or more workers	13.2	13.6	14.1	14.7	13.7	13.1	12.4	11.9
Persons in family of type:								
Married couple	11.5	11.7	12.5	13.0	11.9	11.1	10.4	9.8
Male householder	18.6	19.2	20.9	21.4	20.8	20.1	18.4	17.4
Female householder	35.3	36.0	36.6	37.4	35.5	33.6	32.8	32.1
Geographic regions:								
Northeast	13.2	13.9	15.1	15.8	15.0	15.0	14.2	14.0
Midwest	16.6	16.6	17.4	17.9	16.6	14.5	13.7	12.9
South	20.7	21.1	22.1	22.5	20.3	19.9	18.8	17.6
West	17.1	17.9	18.1	19.5	19.1	18.2	17.5	17.3
Metropolitan area:								
Central city	22.0	23.0	24.1	25.1	23.2	23.1	21.3	20.5
Not central city	12.0	12.7	13.2	13.8	13.5	12.2	11.9	11.4
Nonmetropolitan area	22.8	22.1	23.2	24.0	22.3	21.5	20.8	19.9

^dNAS measure with no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B6. **Poverty Rates With Experimental Thresholds Based on Consumer Expenditure Survey Data: 1990 to 1997—Con.**

Table B6g. **DES-DCM2-NGA/U^e Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	18.0	18.7	19.5	20.3	18.9	18.0	17.3	16.5
Children	24.6	25.6	26.3	27.1	25.0	23.5	22.5	21.5
Nonelderly adults	14.9	15.4	16.1	16.9	15.8	15.2	14.6	13.9
Elderly	19.9	20.3	21.8	22.2	20.9	20.1	19.8	18.9
Unrelated individuals	31.2	31.3	32.4	33.7	30.9	30.8	29.5	28.5
Family members:								
Householder or spouse	14.4	14.9	16.8	16.9	16.1	14.8	15.0	14.4
Other relative	12.9	13.4	16.0	13.4	14.0	14.2	13.8	11.0
White	15.5	16.1	16.6	17.4	16.3	15.7	15.1	14.4
Black	35.0	35.3	37.3	37.9	33.2	31.7	31.0	28.9
Other	18.6	21.6	21.9	24.0	24.8	21.7	19.4	18.7
Hispanic origin ¹	35.1	36.1	36.0	37.5	36.0	35.5	33.2	30.6
No workers	42.9	43.2	46.1	46.5	44.6	43.1	42.4	40.6
One or more workers	13.7	14.3	14.7	15.5	14.3	13.7	13.1	12.5
Persons in family of type:								
Married couple	11.4	11.7	12.4	13.0	11.8	10.9	10.4	9.6
Male householder	20.7	21.3	23.1	23.7	22.9	22.1	20.5	19.6
Female householder	37.7	38.9	39.2	40.2	38.0	36.3	35.7	34.6
Geographic regions:								
Northeast	14.0	14.9	15.8	16.7	15.8	15.7	15.1	14.8
Midwest	17.1	17.4	18.2	18.6	17.2	15.2	14.4	13.6
South	21.4	21.9	22.9	23.5	21.2	20.5	19.9	18.5
West	17.5	18.5	18.6	20.2	19.8	18.9	18.4	17.7
Metropolitan area:								
Central city	22.9	24.0	25.2	26.3	24.2	24.1	22.6	21.6
Not central city	12.4	13.3	13.7	14.4	14.1	12.7	12.5	11.9
Nonmetropolitan area	23.4	22.9	24.0	24.8	23.0	22.2	21.7	20.6

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997**

Table B7a. **Official Poverty Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.5	14.2	14.8	15.1	14.6	13.8	13.7	13.3
Children	20.7	21.8	22.4	22.7	21.8	20.8	20.5	19.9
Nonelderly adults	10.8	11.4	11.9	12.4	11.9	11.4	11.4	10.9
Elderly	12.2	12.4	12.9	12.2	11.7	10.5	10.8	10.5
Unrelated individuals	24.7	24.9	24.9	24.1	23.1	21.4	20.9	21.0
Family members:								
Householder or spouse	5.9	5.9	7.1	6.4	5.8	4.7	5.3	5.3
Other relative	5.8	7.0	7.6	7.4	8.4	7.9	8.7	6.1
White	10.7	11.3	11.9	12.2	11.7	11.2	11.2	11.0
Black	31.9	32.7	33.4	33.1	30.6	29.3	28.4	26.5
Other	15.4	17.6	17.4	18.9	21.1	17.8	17.6	16.1
Hispanic origin ¹	28.1	28.7	29.6	30.6	30.7	30.3	29.4	27.1
No workers	40.2	40.5	42.0	42.4	40.7	38.2	38.1	36.3
One or more workers	8.9	9.5	10.0	10.2	9.9	9.6	9.6	9.5
Persons in family of type:								
Married couple	6.9	7.2	7.7	8.0	7.4	6.8	6.9	6.4
Male householder	15.5	16.3	17.9	18.0	18.3	16.9	16.2	16.1
Female householder	33.1	34.8	34.9	34.8	34.2	32.4	32.0	31.5
Geographic regions:								
Northeast	11.4	12.2	12.6	13.3	12.9	12.5	12.7	12.6
Midwest	12.5	13.2	13.3	13.4	13.0	11.0	10.7	10.4
South	15.8	16.1	17.1	17.2	16.1	15.7	15.1	14.6
West	13.0	14.3	14.9	15.6	15.3	14.9	15.4	14.6
Metropolitan area:								
Central city	19.0	20.2	20.9	21.5	20.9	20.6	19.6	18.8
Not central city	8.7	9.6	9.9	10.3	10.3	9.1	9.4	9.0
Nonmetropolitan area	16.3	16.1	16.9	17.2	16.0	15.6	15.9	15.9

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7b. **NAS-CPI Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.7	14.5	15.1	15.8	14.6	13.8	13.6	13.3
Children	19.0	20.3	21.0	21.7	19.7	18.4	17.8	17.6
Nonelderly adults	11.2	11.8	12.3	13.1	12.1	11.6	11.1	11.1
Elderly	14.8	15.2	16.4	16.8	16.1	14.9	15.6	15.0
Unrelated individuals	20.9	21.2	21.9	23.4	21.8	20.5	20.5	20.8
Family members:								
Householder or spouse	11.9	12.4	14.0	14.0	13.4	12.4	13.1	12.5
Other relative	10.0	10.8	11.8	9.7	11.5	9.5	12.5	8.9
White	11.6	12.3	12.7	13.4	12.5	11.8	11.7	11.5
Black	26.7	28.1	30.3	30.1	25.9	25.1	24.2	23.3
Other	15.6	17.7	17.9	21.0	21.1	17.8	16.7	17.0
Hispanic origin ¹	30.9	32.2	32.1	32.9	31.4	29.5	29.2	27.0
No workers	35.2	35.9	38.5	38.8	37.8	35.4	35.5	34.4
One or more workers	9.9	10.6	10.9	11.6	10.5	10.1	9.9	9.8
Persons in family of type:								
Married couple	8.4	8.9	9.4	9.9	8.8	8.2	8.1	7.8
Male householder	15.8	16.4	17.7	18.8	17.8	17.0	15.9	15.6
Female householder	29.0	30.6	31.1	31.8	30.6	28.3	28.0	27.8
Geographic regions:								
Northeast	12.6	13.5	14.6	15.3	14.2	14.2	14.1	14.1
Midwest	12.2	12.3	12.8	13.5	12.3	10.8	10.0	10.0
South	14.3	15.2	16.1	16.3	14.6	14.1	13.8	13.1
West	15.2	16.6	16.6	18.2	17.5	16.2	16.4	16.1
Metropolitan area:								
Central city	18.8	20.3	21.2	22.2	20.1	20.1	18.8	18.5
Not central city	10.2	11.0	11.4	12.1	11.6	10.4	10.6	10.2
Nonmetropolitan area	14.1	14.0	14.9	15.4	14.1	13.0	13.1	13.1

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7c. **DCM1-CPI^a Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.6	14.3	15.0	15.7	14.5	13.8	13.7	13.3
Children	19.2	20.2	21.0	21.6	19.7	18.6	18.4	17.9
Nonelderly adults	11.1	11.7	12.2	13.0	12.0	11.5	11.4	11.0
Elderly	14.4	14.7	16.0	16.4	15.6	14.5	15.2	14.5
Unrelated individuals	20.3	20.5	21.3	22.9	21.2	19.9	20.1	20.2
Family members:								
Householder or spouse	11.6	11.9	13.6	13.6	12.9	12.0	12.7	12.1
Other relative	9.9	10.7	11.9	9.5	11.2	9.6	12.5	8.4
White	11.5	12.1	12.6	13.1	12.4	11.8	13.9	11.5
Black	26.9	27.9	29.8	30.5	25.6	25.2	28.4	23.5
Other	16.0	17.6	17.9	21.4	21.0	17.9	19.2	16.7
Hispanic origin ¹	30.6	31.8	32.2	32.3	31.3	29.5	29.3	27.1
No workers	34.5	35.0	37.7	38.0	36.8	34.6	34.9	33.8
One or more workers	10.0	10.6	11.0	11.6	10.6	10.2	10.2	9.9
Persons in family of type:								
Married couple	8.4	8.7	9.4	9.7	8.8	8.1	8.1	7.7
Male householder	15.6	16.2	17.6	18.8	17.4	17.0	16.1	15.6
Female householder	29.1	30.6	30.9	31.9	30.2	28.3	28.5	28.1
Geographic regions:								
Northeast	12.5	13.3	14.3	15.2	14.1	14.1	14.1	14.1
Midwest	12.0	12.1	12.7	13.3	12.4	10.8	10.3	10.0
South	14.5	14.9	16.1	16.2	14.4	14.2	14.2	13.3
West	15.0	16.6	16.5	17.9	17.2	16.1	16.1	15.9
Metropolitan area:								
Central city	18.8	20.0	20.9	22.0	20.0	20.1	19.2	18.5
Not central city	10.1	10.8	11.4	12.0	11.4	10.4	10.7	10.2
Nonmetropolitan area	14.2	13.9	14.8	15.1	14.1	12.8	13.2	13.2

^aChild care method based on SIPP.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7d. **DCM2-CPI^b Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.6	14.4	15.1	15.8	14.6	13.8	13.6	13.3
Children	19.0	20.2	21.0	21.6	19.7	18.4	18.0	17.7
Nonelderly adults	11.1	11.7	12.3	13.0	12.1	11.5	11.3	11.0
Elderly	14.7	15.1	16.3	16.7	16.0	14.8	15.5	14.9
Unrelated individuals	20.7	21.0	21.8	23.3	21.6	20.3	20.4	20.7
Family members:								
Householder or spouse	11.8	12.3	13.9	13.9	13.3	12.3	13.0	12.4
Other relative	10.0	10.6	11.9	9.5	11.5	9.4	12.6	8.9
White	11.6	12.2	12.6	13.3	12.5	11.8	11.7	11.5
Black	26.6	27.7	30.2	30.0	25.8	25.1	24.4	23.2
Other	15.6	17.8	18.1	21.1	20.9	17.8	16.7	16.9
Hispanic origin ¹	30.8	32.0	31.9	32.8	31.1	29.5	29.1	26.9
No workers	35.1	35.7	38.3	38.6	37.5	35.1	35.3	34.4
One or more workers	9.9	10.6	10.9	11.6	10.5	10.1	9.9	9.8
Persons in family of type:								
Married couple	8.4	8.8	9.4	9.9	8.8	8.2	8.1	7.8
Male householder	15.6	16.3	17.6	18.7	17.6	17.0	15.9	15.6
Female householder	29.0	30.4	31.0	31.6	30.3	28.2	28.1	27.8
Geographic regions:								
Northeast	12.5	13.5	14.4	15.3	14.2	14.1	14.1	14.0
Midwest	12.2	12.2	12.9	13.3	12.3	10.7	10.1	10.0
South	14.4	15.1	16.1	16.2	14.5	14.1	13.9	13.3
West	15.2	16.5	16.5	18.2	17.3	16.2	16.3	16.0
Metropolitan area:								
Central city	18.8	20.3	21.0	22.0	20.0	20.1	19.0	18.5
Not central city	10.1	10.9	11.4	12.1	11.6	10.3	10.5	10.2
Nonmetropolitan area	14.2	13.9	14.9	15.3	14.1	12.9	13.2	13.2

^bChild care method based on AFDC program allowances.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7e. **DES-DCM2-CPI^c Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.5	14.3	15.1	15.7	14.5	13.8	13.6	13.3
Children	18.4	19.7	20.6	21.2	19.2	18.0	17.6	17.3
Nonelderly adults	11.2	11.9	12.4	13.2	12.2	11.7	11.5	11.2
Elderly	14.8	15.3	16.6	16.6	15.7	15.2	15.6	14.9
Unrelated individuals	23.0	23.7	24.4	25.4	23.6	23.4	22.7	22.8
Family members:								
Householder or spouse	10.8	11.2	13.0	12.6	11.9	11.4	12.0	11.2
Other relative	9.6	10.4	11.2	9.7	10.7	9.6	11.6	8.6
White	11.5	12.2	12.7	13.3	12.4	11.9	11.7	11.5
Black	26.3	27.8	30.2	30.0	25.9	25.2	24.7	23.5
Other	15.6	17.9	18.1	21.1	20.7	18.1	16.5	16.9
Hispanic origin ¹	30.5	31.2	31.4	32.5	30.8	29.5	28.6	26.5
No workers	35.3	36.0	38.6	39.0	37.1	35.8	36.0	34.5
One or more workers	9.7	10.5	10.9	11.5	10.5	10.1	9.8	9.8
Persons in family of type:								
Married couple	7.9	8.2	8.9	9.4	8.3	7.7	7.6	7.3
Male householder	16.5	17.5	18.7	19.9	18.5	18.1	16.8	16.6
Female householder	29.8	31.5	32.2	32.5	31.1	29.3	29.2	28.7
Geographic regions:								
Northeast	12.5	13.6	14.5	15.1	14.2	14.6	14.1	14.2
Midwest	12.0	12.3	12.7	13.4	12.3	10.7	10.1	10.0
South	14.2	15.0	16.2	16.2	14.5	14.0	13.8	13.2
West	15.2	16.2	16.5	18.0	17.2	16.3	16.4	16.0
Metropolitan area:								
Central city	18.8	20.3	21.0	22.1	20.0	20.3	19.0	18.4
Not central city	10.0	10.8	11.4	11.9	11.5	10.4	10.5	10.3
Nonmetropolitan area	13.8	13.8	14.9	15.3	14.0	12.9	13.2	13.0

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7f. **NGA-CPI^d Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.8	14.6	15.2	15.8	14.6	13.9	13.5	13.3
Children	19.1	20.3	21.0	21.5	19.7	18.4	17.8	17.4
Nonelderly adults	11.3	11.9	12.4	13.0	12.1	11.7	11.3	11.1
Elderly	14.9	15.6	16.9	17.0	16.2	15.1	15.4	15.3
Unrelated individuals	21.3	21.8	22.3	23.7	21.8	21.1	20.4	20.9
Family members:								
Householder or spouse	12.0	12.7	14.6	14.2	13.5	12.4	13.1	13.0
Other relative	9.4	10.4	11.1	9.8	11.4	10.1	11.8	8.7
White	11.8	12.4	12.9	13.3	12.6	12.0	11.7	11.5
Black	27.3	28.0	30.3	30.3	26.3	25.1	24.3	23.2
Other	13.9	17.3	16.9	19.6	19.5	17.0	15.1	16.3
Hispanic origin ¹	26.8	28.5	28.7	29.2	28.3	28.6	26.0	24.9
No workers	34.8	35.7	38.4	38.9	37.5	35.2	35.4	34.9
One or more workers	10.1	10.8	11.1	11.6	10.6	10.2	9.8	9.7
Persons in family of type:								
Married couple	8.6	9.1	9.7	9.9	8.9	8.4	8.0	7.8
Male householder	15.7	16.6	17.4	18.3	17.3	17.0	15.7	15.3
Female householder	29.0	30.3	31.1	31.8	30.3	28.1	28.0	28.0
Geographic regions:								
Northeast	10.4	11.3	12.1	12.9	12.0	12.0	12.0	12.0
Midwest	13.3	13.3	14.0	14.4	13.2	11.7	11.1	10.8
South	16.4	17.3	18.2	18.2	16.5	15.8	15.4	14.8
West	13.3	14.8	14.7	15.9	15.5	14.8	14.3	14.4
Metropolitan area:								
Central city	17.5	18.9	19.8	20.6	18.9	18.9	17.5	17.2
Not central city	9.4	10.3	10.8	11.3	10.9	9.8	9.8	9.4
Nonmetropolitan area	18.0	18.0	18.6	19.0	17.5	16.8	16.9	16.5

^dNAS measure with no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B7. **Poverty Rates Standardized to Match Official Rates for All Persons in 1997 With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.**

Table B7g. **DES-DCM2-NGA-CPI^e Measure**

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.7	14.4	15.2	15.7	14.5	13.8	13.4	13.3
Children	18.6	19.6	20.5	21.0	19.1	18.0	17.2	17.2
Nonelderly adults	11.4	12.0	12.5	13.2	12.1	11.7	11.3	11.2
Elderly	15.0	15.6	17.1	16.9	16.1	15.5	15.8	15.2
Unrelated individuals	23.7	24.1	25.1	25.9	24.3	23.7	22.9	22.9
Family members:								
Householder or spouse	10.8	11.6	13.4	13.0	12.1	11.6	12.3	11.6
Other relative	8.9	9.9	11.2	9.1	11.0	9.3	11.2	8.6
White	11.7	12.3	12.8	13.3	12.5	11.9	11.6	11.6
Black	27.0	27.9	30.0	30.2	25.8	25.2	24.3	23.1
Other	14.0	16.7	17.0	19.3	19.3	16.6	15.2	15.9
Hispanic origin ¹	26.7	27.6	28.2	28.1	27.8	27.8	25.3	24.6
No workers	34.9	35.4	38.5	38.6	37.3	35.4	35.6	34.7
One or more workers	10.0	10.7	11.0	11.5	10.4	10.1	9.7	9.7
Persons in family of type:								
Married couple	8.2	8.5	9.1	9.4	8.3	7.9	7.4	7.3
Male householder	16.4	17.5	18.6	19.5	18.3	17.8	16.7	16.2
Female householder	29.8	31.0	31.9	32.5	30.9	29.0	29.0	28.7
Geographic regions:								
Northeast	10.3	11.3	12.0	12.9	12.0	11.8	12.2	11.8
Midwest	13.2	13.2	14.0	14.4	13.1	11.8	11.0	10.8
South	16.4	17.1	18.2	18.3	16.2	15.9	15.3	15.1
West	13.3	14.4	14.5	15.5	15.3	14.5	14.0	14.2
Metropolitan area:								
Central city	17.5	18.8	19.6	20.6	18.8	19.0	17.7	17.2
Not central city	9.3	10.2	10.7	11.2	10.8	9.7	9.7	9.7
Nonmetropolitan area	17.8	17.6	18.6	18.9	17.3	16.7	16.6	16.4

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997

Table B8a. Official Poverty Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	13.5	14.2	14.8	15.1	14.6	13.8	13.7	13.3
Children	20.7	21.8	22.4	22.7	21.8	20.8	20.5	19.9
Nonelderly adults	10.8	11.4	11.9	12.4	11.9	11.4	11.4	10.9
Elderly	12.2	12.4	12.9	12.2	11.7	10.5	10.8	10.5
Unrelated individuals	24.7	24.9	24.9	24.1	23.1	21.4	20.9	21.0
Family members:								
Householder or spouse	5.9	5.9	7.1	6.4	5.8	4.7	5.3	5.3
Other relative	5.8	7.0	7.6	7.4	8.4	7.9	8.7	6.1
White	10.7	11.3	11.9	12.2	11.7	11.2	11.2	11.0
Black	31.9	32.7	33.4	33.1	30.6	29.3	28.4	26.5
Other	15.4	17.6	17.4	18.9	21.1	17.8	17.6	16.1
Hispanic origin ¹	28.1	28.7	29.6	30.6	30.7	30.3	29.4	27.1
No workers	40.2	40.5	42.0	42.4	40.7	38.2	38.1	36.3
One or more workers	8.9	9.5	10.0	10.2	9.9	9.6	9.6	9.5
Persons in family of type:								
Married couple	6.9	7.2	7.7	8.0	7.4	6.8	6.9	6.4
Male householder	15.5	16.3	17.9	18.0	18.3	16.9	16.2	16.1
Female householder	33.1	34.8	34.9	34.8	34.2	32.4	32.0	31.5
Geographic regions:								
Northeast	11.4	12.2	12.6	13.3	12.9	12.5	12.7	12.6
Midwest	12.5	13.2	13.3	13.4	13.0	11.0	10.7	10.4
South	15.8	16.1	17.1	17.2	16.1	15.7	15.1	14.6
West	13.0	14.3	14.9	15.6	15.3	14.9	15.4	14.6
Metropolitan area:								
Central city	19.0	20.2	20.9	21.5	20.9	20.6	19.6	18.8
Not central city	8.7	9.6	9.9	10.3	10.3	9.1	9.4	9.0
Nonmetropolitan area	16.3	16.1	16.9	17.2	16.0	15.6	15.9	15.9

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8b. NAS/U-CPI Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.1	16.9	17.6	18.3	17.0	16.3	16.0	15.4
Children	22.5	23.8	24.3	24.8	22.8	21.7	21.1	20.3
Nonelderly adults	13.1	13.8	14.4	15.2	14.1	13.6	13.4	12.8
Elderly	17.1	17.9	19.4	19.7	18.5	17.7	18.3	17.4
Unrelated individuals	24.3	24.9	25.9	27.0	24.7	24.6	24.0	23.9
Family members:								
Householder or spouse	13.7	14.5	16.5	16.5	15.6	14.4	15.6	14.5
Other relative	10.8	12.7	14.0	13.2	13.9	12.7	13.7	10.3
White	13.7	14.4	14.9	15.5	14.6	14.0	13.9	13.4
Black	31.5	33.1	34.0	34.5	30.1	29.4	28.4	26.8
Other	18.7	20.2	21.5	24.0	23.9	20.8	19.2	18.8
Hispanic origin ¹	35.7	37.2	37.2	37.9	36.1	35.4	34.2	31.6
No workers	39.8	40.4	42.9	43.4	41.8	40.0	40.0	38.4
One or more workers	12.0	12.7	13.1	13.7	12.6	12.2	12.0	11.6
Persons in family of type:								
Married couple	10.2	10.7	11.5	11.8	10.6	10.1	9.9	9.4
Male householder	17.7	18.9	20.1	21.1	20.2	19.2	18.3	17.5
Female householder	33.7	35.2	35.0	36.0	34.5	32.5	32.3	31.4
Geographic regions:								
Northeast	14.9	15.9	17.0	17.8	16.7	17.0	16.9	16.2
Midwest	14.1	14.4	15.0	15.5	14.2	12.5	12.2	11.6
South	17.0	17.8	18.7	18.9	17.0	16.7	16.1	15.3
West	17.9	19.3	19.4	20.8	20.2	19.1	19.0	18.6
Metropolitan area:								
Central city	22.2	23.4	24.5	25.3	23.3	23.4	22.3	21.2
Not central city	11.9	12.9	13.3	14.1	13.6	12.3	12.6	11.9
Nonmetropolitan area	16.7	16.9	17.4	18.0	16.2	15.6	15.3	15.4

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8c. DCM1/U-CPI^a Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.4	17.3	18.0	18.8	17.5	16.8	16.6	15.9
Children	23.2	24.5	25.1	25.8	23.9	22.7	22.4	21.4
Nonelderly adults	13.4	14.1	14.7	15.5	14.5	14.0	13.8	13.2
Elderly	17.1	17.9	19.4	19.7	18.5	17.7	18.3	17.4
Unrelated individuals	24.3	24.9	25.9	27.0	24.7	24.6	24.0	23.9
Family members:								
Householder or spouse	13.7	14.5	16.5	16.5	15.6	14.4	15.6	14.5
Other relative	10.9	13.0	14.2	13.3	13.9	12.6	13.9	10.3
White	14.0	14.6	15.3	15.8	15.0	14.4	14.3	13.8
Black	32.4	34.0	34.8	36.0	31.0	30.3	30.2	27.9
Other	18.9	20.7	21.6	24.7	24.6	21.7	20.2	19.2
Hispanic origin ¹	36.4	37.8	38.1	38.8	37.0	36.5	35.5	33.0
No workers	39.8	40.4	42.9	43.4	41.8	40.0	40.0	38.4
One or more workers	12.4	13.2	13.6	14.2	13.2	12.8	12.7	12.2
Persons in family of type:								
Married couple	10.4	10.9	11.7	12.1	11.0	10.4	10.3	9.7
Male householder	17.9	18.9	20.3	21.5	20.5	19.5	18.8	18.0
Female householder	34.5	36.0	36.0	37.1	35.4	33.6	33.6	32.5
Geographic regions:								
Northeast	15.2	16.0	17.4	18.2	17.3	17.5	17.4	16.6
Midwest	14.3	14.9	15.4	15.9	14.8	12.8	12.6	12.0
South	17.6	18.3	19.1	19.5	17.5	17.1	17.0	16.0
West	18.1	19.5	19.7	21.2	20.5	19.8	19.6	19.2
Metropolitan area:								
Central city	22.6	23.8	25.0	25.9	23.9	23.9	23.2	22.1
Not central city	12.2	13.3	13.6	14.4	14.0	12.8	13.0	12.4
Nonmetropolitan area	17.2	17.2	17.8	18.4	16.8	16.0	15.9	15.7

^aChild care method based on SIPP.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8d. DCM2/U-CPI^b Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.1	17.0	17.7	18.4	17.1	16.4	16.1	15.4
Children	22.6	23.9	24.4	25.0	23.1	22.0	21.4	20.5
Nonelderly adults	13.2	13.9	14.4	15.2	14.2	13.7	13.4	12.9
Elderly	17.1	17.9	19.4	19.7	18.5	17.7	18.3	17.4
Unrelated individuals	24.3	24.9	25.9	27.0	24.7	24.6	24.0	23.9
Family members:								
Householder or spouse	13.7	14.5	16.5	16.5	15.6	14.4	15.6	14.5
Other relative	10.8	12.9	13.9	13.2	14.0	12.7	13.7	10.3
White	13.7	14.4	15.0	15.6	14.7	14.1	14.0	13.5
Black	31.8	33.2	34.0	34.6	30.3	29.6	28.7	26.8
Other	18.6	20.2	21.7	24.1	24.2	21.1	19.2	18.8
Hispanic origin ¹	35.9	37.2	37.2	37.9	36.0	35.6	34.4	31.7
No workers	39.8	40.4	42.9	43.4	41.8	40.0	40.0	38.4
One or more workers	12.0	12.8	13.2	13.8	12.7	12.4	12.1	11.7
Persons in family of type:								
Married couple	10.3	10.8	11.5	11.9	10.7	10.2	10.0	9.4
Male householder	17.6	18.7	20.2	21.1	20.0	19.4	18.3	17.6
Female householder	33.7	35.3	35.2	36.1	34.7	32.8	32.5	31.5
Geographic regions:								
Northeast	14.9	15.9	17.1	17.9	16.8	17.0	16.9	16.3
Midwest	14.2	14.6	15.0	15.6	14.4	12.6	12.4	11.6
South	17.1	17.9	18.7	18.9	17.0	16.8	16.2	15.5
West	17.9	19.3	19.4	20.9	20.3	19.2	19.2	18.6
Metropolitan area:								
Central city	22.2	23.4	24.4	25.3	23.4	23.4	22.4	21.2
Not central city	11.9	13.0	13.4	14.1	13.6	12.5	12.6	12.1
Nonmetropolitan area	16.8	16.9	17.5	18.1	16.3	15.8	15.5	15.4

^bChild care method based on AFDC program allowances.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8e. DES-DCM2/U-CPI^c Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.8	17.7	18.4	19.1	17.6	17.0	16.8	16.1
Children	23.0	24.3	24.9	25.6	23.3	22.3	21.9	20.8
Nonelderly adults	13.9	14.6	15.2	16.0	14.8	14.3	14.2	13.6
Elderly	18.1	18.9	20.3	20.7	19.4	18.5	19.0	18.4
Unrelated individuals	28.4	29.4	30.2	31.5	28.8	28.8	28.0	28.2
Family members:								
Householder or spouse	13.0	13.8	15.6	15.7	14.7	13.5	14.5	13.9
Other relative	12.2	12.7	14.9	13.2	13.7	12.4	14.0	10.2
White	14.3	15.0	15.6	16.3	15.2	14.6	14.5	14.1
Black	32.8	34.2	35.5	35.8	31.0	30.8	30.1	28.1
Other	19.4	21.7	22.4	24.2	25.1	21.5	20.3	19.0
Hispanic origin ¹	36.4	37.8	38.3	39.2	37.0	36.3	35.1	32.6
No workers	41.3	42.0	44.5	44.9	43.2	41.5	41.6	39.9
One or more workers	12.5	13.3	13.7	14.4	13.1	12.7	12.6	12.2
Persons in family of type:								
Married couple	10.2	10.7	11.5	11.9	10.5	10.1	9.9	9.3
Male householder	19.5	21.0	22.1	22.9	22.3	20.9	20.3	19.6
Female householder	36.1	37.4	37.6	38.6	36.7	34.9	34.8	33.7
Geographic regions:								
Northeast	15.6	16.7	17.8	18.5	17.4	17.6	17.8	17.1
Midwest	14.8	15.1	15.8	16.2	14.8	13.1	12.7	12.2
South	17.7	18.6	19.5	19.8	17.6	17.4	17.0	16.2
West	18.6	20.0	20.1	21.7	21.0	19.9	19.9	19.3
Metropolitan area:								
Central city	23.2	24.3	25.4	26.3	24.1	24.3	23.5	22.2
Not central city	12.4	13.6	13.9	14.7	14.1	12.9	13.1	12.5
Nonmetropolitan area	17.5	17.4	18.3	18.9	17.0	16.3	16.2	16.0

^cChild care method based on AFDC program allowances and three-parameter equivalence scale.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8f. NGA/U-CPI^d Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	16.6	17.3	18.2	18.6	17.3	16.6	16.2	15.8
Children	23.1	24.2	24.9	25.3	23.4	22.1	21.3	21.0
Nonelderly adults	13.5	14.1	14.8	15.4	14.4	13.8	13.5	13.1
Elderly	17.9	18.6	20.4	20.2	19.2	18.5	18.7	17.9
Unrelated individuals	25.5	26.0	22.3	27.8	25.8	25.2	24.6	24.5
Family members:								
Householder or spouse	14.5	15.1	14.6	16.9	16.1	15.3	16.1	15.1
Other relative	11.0	13.0	11.1	12.2	13.2	13.9	13.3	10.5
White	14.2	14.8	15.5	15.9	15.0	14.5	14.1	13.8
Black	32.6	33.0	35.0	34.5	30.4	29.2	28.9	27.1
Other	17.6	19.9	20.9	22.6	23.1	19.9	18.1	18.5
Hispanic origin ¹	32.7	33.8	34.0	34.6	33.6	33.5	31.7	30.2
No workers	40.1	40.6	43.6	43.8	41.9	40.4	40.4	39.1
One or more workers	12.5	13.1	13.6	14.0	13.0	12.5	12.2	11.9
Persons in family of type:								
Married couple	10.8	11.3	12.0	12.2	11.2	10.5	10.2	9.8
Male householder	18.0	18.8	20.2	20.8	20.0	19.6	18.3	17.4
Female householder	33.9	35.1	35.7	36.3	34.3	32.5	32.4	32.1
Geographic regions:								
Northeast	12.5	13.5	14.5	15.1	14.4	14.4	14.0	14.0
Midwest	15.8	16.1	16.9	17.0	15.9	13.9	13.4	12.9
South	19.7	20.4	21.4	21.6	19.4	19.1	18.6	17.6
West	16.2	17.4	17.6	18.7	18.2	17.5	17.3	17.3
Metropolitan area:								
Central city	21.0	22.3	23.5	24.2	22.3	22.1	21.0	20.5
Not central city	11.3	12.3	12.8	13.2	12.9	11.7	11.7	11.4
Nonmetropolitan area	21.8	21.3	22.3	22.7	21.2	20.6	20.4	19.9

^dNAS measure with no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Table B8. Poverty Rates With Experimental Thresholds Based on the CPI-U: 1990 to 1997—Con.

Table B8g. DES-DCM2-NGA/U-CPI^e Measure

	1990	1991	1992	1993	1994	1995	1996	1997
All persons	17.3	18.1	18.9	19.4	18.1	17.2	17.1	16.5
Children	23.6	24.9	25.6	25.9	24.0	22.5	22.3	21.5
Nonelderly adults	14.3	14.9	15.6	16.2	15.2	14.5	14.4	13.9
Elderly	19.0	19.5	21.0	21.1	20.1	19.1	19.6	18.9
Unrelated individuals	29.8	30.1	31.3	32.2	29.9	29.6	29.0	28.5
Family members:								
Householder or spouse	13.7	14.4	16.2	16.0	15.3	13.9	14.9	14.4
Other relative	12.1	12.7	15.1	12.5	13.5	12.6	13.6	11.0
White	14.9	15.6	16.1	16.6	15.7	15.0	14.9	14.4
Black	34.0	34.5	36.5	36.2	31.9	30.3	30.7	28.9
Other	17.9	20.7	21.3	23.0	23.9	20.8	19.2	18.7
Hispanic origin ¹	33.6	34.9	35.0	35.8	34.4	34.2	32.9	30.6
No workers	41.6	42.2	45.1	45.1	43.3	41.5	41.9	40.6
One or more workers	13.1	13.8	14.2	14.7	13.7	13.0	13.0	12.5
Persons in family of type:								
Married couple	10.8	11.3	11.9	12.3	11.2	10.4	10.2	9.6
Male householder	19.7	20.6	22.6	22.7	22.2	21.2	20.4	19.6
Female householder	36.6	37.9	38.4	38.7	36.7	34.8	35.3	34.6
Geographic regions:								
Northeast	13.3	14.4	15.2	15.8	15.0	15.0	14.9	14.8
Midwest	16.5	16.9	17.8	17.6	16.5	14.4	14.2	13.6
South	20.7	21.2	22.3	22.5	20.3	19.7	19.7	18.5
West	16.7	18.1	18.1	19.4	19.0	18.1	18.1	17.7
Metropolitan area:								
Central city	22.0	23.4	24.5	25.1	23.3	23.0	22.4	21.6
Not central city	11.9	12.9	13.3	13.9	13.6	12.2	12.4	11.9
Nonmetropolitan area	22.5	22.2	23.2	23.6	21.9	21.3	21.4	20.6

^eChild care method based on AFDC program allowances, three-parameter equivalence scale, and no geographic adjustment.

¹Persons of Hispanic origin may be of any race.

Source: U.S. Census Bureau tabulations of March Current Population Survey data.

Appendix C.

Definitions of Elements in the Experimental Poverty Measures

DEFINING THE THRESHOLDS

In this study, as in the study by the National Academy of Science Panel on Poverty Measurement and Family Assistance (hereafter the panel) and in previous work (Garner et al., 1998 and Short et al., May 1998), the thresholds are calculated by following several steps. First, median expenditures (adjusted to current dollars) for reference units are obtained from the Consumer Expenditure Survey (CEX) using their food, clothing, shelter, and utilities (FCSU) expenditures.¹ Second, percentages of median expenditures are selected which reflect the 30th and 35th percentiles of the distribution of FCSU expenditures. These percentiles translate to approximately 78 and 83 percent of the median. The panel concluded in their study that these percentiles seem to represent a reasonable range for the FCSU component of the reference family's threshold.²

Third, expenses for their other needs (e.g., household supplies, personal care, and nonwork-related expenses) are accounted for through the use of a small multiplier. The panel recommended a lower and upper value for the multiplier of 1.15 and 1.25, respectively. They stated that this range of multipliers compared favorably to estimates from other studies³ that range from 1.14 to 1.30. In this study, as in the panel's work, the base-year threshold is computed by taking the average of these upper and lower values for both the percentages and multipliers (i.e., $\text{Threshold} = 0.5 * (1.15 * .78 + 1.25 * .83) * \text{median}$), with the result being that the threshold equals $0.96725 * \text{median}$ expenditures for the basic bundle. Hence, the resulting threshold of \$15,998 is almost equal to median expenditures on FCSU of \$16,540 for 1997.

Fourth, adjustments are made to reflect geographic differences in costs. Following the panel, we use interarea housing cost indexes calculated from the 1990 census data on gross rent (not including utilities) for apartments with specified characteristics, adjusted for the share of

housing (including utilities) in the proposed poverty budget.⁴ ⁵ These indexes are produced for five population size categories within each of the nine geographic census divisions. In our application, we normalize the indexes based on the geographic distribution of the weighted sample. The area indexes are produced relative to the U.S. average index, which is equal to 1.0. For example, the threshold for the reference unit in a large metropolitan area in New England is 27 percent higher than the national average, while it is 15 percent lower than the national average if this family lives in a nonmetropolitan area in the West South Central region (as shown in Table C3).

Fifth, an equivalence scale adjusts the reference unit's threshold to produce thresholds for family units with different characteristics from those of the reference unit. The panel recommended a two-parameter equivalence scale that accounts for the differing needs of adults and children and the economies of scale of living in a larger household. This scale is $(A+pK)^f$, where A and K represent the number of adults and children, p represents the adult-equivalent of one child and f represents the scale economy factor. Since the choice of equivalence scale can have substantial effects on the distribution of poverty,⁶ we examine other equivalence scales using the 1997 CPS and the official resource definition.

Sixth, the base year thresholds are updated over time using a price adjustment factor. While the panel recommended updating by the change in median expenditures on FCSU each year (a quasi-relative adjustment⁷), they also recommended that an alternative set of thresholds be produced during the first several years after the new poverty measure is implemented which are updated for price change only.⁸ In this report we present two alternative choices for updating the thresholds.

There are also some slight differences in the calculation of the thresholds in this report from previous work. The thresholds presented here do not include rent as pay or

¹The panel assumed that the quarterly interviews are independent and produced annual expenditures by multiplying each reference unit's expenditures by four. All expenditures were converted to 1992 constant dollars. For example, if the collection quarter of the data occurred sometime during 1989, the 1989 expenditures were updated using the change in overall prices between 1989 and 1992. An alternative to the all-items CPI-U could have been used for this purpose. For example, a weighted average of the CPIs for the items included in the threshold could have been used.

²Citro and Michael, 1995, p. 149.

³For example, see Renwick, 1993, pp. 573-582; Bureau of Labor Statistics, 1982; Schwarz and Volgy, 1992.

⁴The panel set this share at 44 percent.

⁵Johnson et al., 1997 found that these indexes produced similar results to those using interarea price indexes that account for more expenditure categories than housing.

⁶See Citro and Michael, 1995 and Johnson et al., 1997.

⁷An explicitly relative adjustment would tie poverty thresholds directly to changes in levels of living, such as median income or expenditures on all goods. Updating with changes in consumption of basic goods is a more conservative approach.

⁸Citro and Michael, 1995, p. 7.

Table C1. Thresholds for a Reference Family of Two Adults With Two Children

[Dollars]

Year	Official	FCSU ¹	
		CEX	CPI-U
1990	13,254	13,342	13,028
1991	13,812	13,843	13,576
1992	14,228	14,253	13,985
1993	14,654	14,791	14,403
1994	15,029	15,166	14,772
1995	15,455	15,545	15,191
1996	15,911	15,744	15,639
1997	16,276	15,998	15,998
Percent change 1990 to 1997	22.8	19.9	22.8

¹Food, clothing, shelter, and utilities.

Note: Columns adjusted backward from 1997 estimates; see text for details.

Source: Bureau of Labor Statistics tabulations of Consumer Expenditure Survey data.

Table C2. Alternative Equivalence Scales

Family type	Official	Two-parameter scales ¹				Three-parameter scale ²	Canadian ³
		f=0.65; p=0.7	f=0.75; p=0.7	f=0.65; p=0.85	f=0.5; p=1.0		
Single adult	⁴ 0.513	0.451	0.399	0.427	0.500	0.463	0.500
Two adults	⁴ 0.660	0.708	0.672	0.700	0.707	0.653	0.670
Three adults	0.771	0.922	0.910	0.873	0.866	1.000	0.900
Two adults, one child	0.794	0.861	0.841	0.844	0.866	0.880	0.850
Two adults, two children	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Two adults, three children	1.177	1.129	1.151	1.144	1.118	1.114	1.150
One adult, one child	0.680	0.637	0.595	0.637	0.707	0.699	0.700
One adult, two children	0.794	0.797	0.770	0.815	0.866	0.830	0.850
Ratios of Scale							
Single adult to two adults	0.777	0.637	0.595	0.637	0.707	0.714	0.709
Single parent with two children to two adults with one child	1.000	0.926	0.915	0.965	1.000	1.000	0.943

¹Two-parameter scale = (adults + p * children)^f

²Three-parameter scale = (ratio of the scale for two adults to one adult is 1.41
For single parents (adults + .8 + .5 * children -1)⁻⁷
All other families (adults + .5 * children)⁻⁷)

³Canadian scale = (1 + .4 * (adults - 1) + .4 * (first child) + .3 * (children -1))

⁴Nonelderly adults.

Source: Johnson et al., 1997.

interest on home equity loans in the calculation of shelter costs. They exclude expenditures on utilities for vacation homes. They also do not include food as pay in the calculation of food expenditures.

Table C1 presents the official thresholds and the experimental thresholds used in this report for 1990 through 1997. The thresholds presented in column (2) are based on estimates of median expenditures using 3-year averages of CEX data and those in column (3) are CPI-U adjusted backward from 1997. From 1990 to 1997, the CPI-U adjusted thresholds increased by 22.8 percent while the median expenditure adjusted thresholds increased by 19.9 percent. In contrast, the panel found that the median expenditures increased more than the CPI-U between 1980

and 1992. However, the panel noted that such a relationship may not hold for the year-to-year changes.⁹ We found that for the longer period between 1982 and 1997, the median expenditures for the basic bundle also increased more than the CPI-U.¹⁰ Changes in the estimated median expenditures are more volatile than changes in the CPI-U, due in part to the relatively small sample sizes (approximately 5,000 consumer units are interviewed each quarter but only about 9.5 percent of the consumer units are families with two adults and two children) in the CEX.

⁹Citro and Michael, 1995, p. 158.

¹⁰Johnson et al., 1997.

EQUIVALENCE SCALES

To examine the sensitivity of the poverty rate to the equivalence scale, we consider several different equivalence scales here. These scales include three different two-parameter scales, a one-parameter scale (the square root of family size), the scales from the Canadian low-income cutoffs and an alternative three-parameter scale. Table C2 presents the scales, normalized so that the scale for the reference unit is 1.0.

The two-parameter scales are given by the following parameter values: $p=0.7$ and $f=0.65$ (the panel's lower bound), $p=0.7$ and $f=0.75$ (the panel's upper bound), and $p=0.85$ and $f=0.65$. The one-parameter scale is basically a two-parameter scale that treats adults and children similarly (i.e., $p=1.0$). These are also called constant-elasticity scales. This scale was suggested by Watts¹¹ and Ruggles¹² and is given by the square root of family size $(A+K)^{0.5}$.

The Canadian scale is determined by using 1.0 for the first adult, 0.4 for each additional adult, and 0.3 for each child.¹³ In single-parent families, the first child increased the scale by 0.4 and each additional child by 0.3. The final scale, proposed by Betson, is a three-parameter scale¹⁴ which allows for the first child in a single-adult family to increase the scale more than the first child in a two-adult family. In addition, the three-parameter scale¹⁵ restricts the relationship between two-adult and one-adult families so that the scale for the two-adult family is 41 percent higher than the scale for the single-adult family.¹⁶ As noted in the report, compared with the panel's recommendation, the three-parameter scale provides more economies of scale between singles and childless couples and more similarity between the scales for families of one parent with two children and two parents with one child.

To illustrate these latter two issues the last two rows in Table C2 present the ratios of the scales for these family types. The two-parameter scale assumes smaller economies of scale between one- and two-person families than the other scales shown, and the two scales suggested by the panel assume that single-parent families require less than two-parent families of a similar size.

The other main difference between all these scales and the official scales is the treatment of the elderly. None of the experimental scales distinguish between elderly and nonelderly families, while the official scales assign a single elderly person a scale of 0.473 and an elderly couple a scale of 0.597 (versus 0.513 and 0.660 for nonelderly

adults, respectively). In all cases, the scale (and respective threshold) increases for elderly couples, and in all but two cases, falls for single elderly individuals.

The main effect of these different scales is in the composition of the poor. The different thresholds for the elderly greatly affect their poverty rates. Table A2b in Appendix A shows that the elderly range from comprising 8.3 percent of the poverty population to 11.4 percent, compared with the current official proportion, 9.5 percent in 1997. The percentage composition for children ranges from 38.0 percent to 41.0 percent. The various scales also affect the composition for married couples and female householder families; however, they do not change the composition of the poverty population for regions or race/ethnicity categories.

The final rows in Table A2a and Table A2b show that the scales have a large impact on the poverty rates for families of different sizes. The poverty rate for singles ranges from 15.1 for the panel's upper bound ($f=0.75$ and $p=0.7$) to 21.4 percent for the square root of family size (and also the Canadian scale). The poverty rate for two-person families using these scales is 8.4 percent and 9.2 percent, representing the lower and upper bounds, respectively.

The significant effect on elderly poverty is again highlighted in Table A2a. Under the official poverty measure, elderly unrelated individuals are almost four times more likely than elderly couples (householder or spouse) to be poor, while using the panel's upper bound causes the likelihood to fall to only 1.5 times. In fact, all of the experimental scales yield a more equal likelihood of poverty between singles and couples, with the three-parameter scale yielding the largest differential between the two.

GEOGRAPHIC ADJUSTMENTS

As noted by the panel, "There is wide agreement that it is desirable to adjust poverty thresholds for differences in prices... [however] ...There are no geographic area cost-of-living indexes that correspond to the Consumer Price Index for Urban Consumers (CPI-U)."¹⁷ Various approaches have been proposed to estimate interarea price differences. In this section, the panel's method for accounting for differences in prices by geographic area is explained first. This is followed by a method that uses interarea consumer price indexes developed by a team of researchers at the Bureau of Labor Statistics.¹⁸

The NAS Panel's Method

The panel developed an interarea price index for housing.¹⁹ They focused on housing because housing expenditures are the largest component of the poverty budget and because variations in housing costs are significant by

¹¹Suggested by Watts in conversation with the panel, see Citro and Michael, 1995, p. 181, footnote b.

¹²Ruggles, 1990.

¹³Wolfson and Evans, 1989.

¹⁴See Betson, 1996.

¹⁵See Johnson et al., 1997 for applications of this scale.

¹⁶The three-parameter scale is given by 1.41 for two-adult only households, $(A + C + p(K-1))^f$ for single-parent households and $(A + pK)^f$ for other households, where $p=.5$, $f=.7$ and $C=.8$.

¹⁷Citro and Michael, 1995, pp. 182-183.

¹⁸Kokoski et al., 1994 (KCM). For alternative indexes, see Malpezzi et al., 1980 and 1998.

¹⁹Citro and Michael, 1995, pp. 194-197.

region and population size. They used a modified version of a method developed by the Department of Housing and Urban Development (HUD) for the administration of Section 8 rental housing subsidies. Using a combination of data from the American Housing Survey, the latest decennial census, and a random-digit dialing survey, HUD develops a set of Fair Market Rents that vary by geographic location. The panel used census data only and computed index values for each of the 341 metropolitan areas (setting the U.S. average equal to 1.0). The index values were based on the cost of two-bedroom rental units (not including utilities) with specific characteristics at the 45th percentile of the value of the distribution for each area. The data were then grouped into six population size categories within each of the nine census divisions. The nonmetropolitan areas were aggregated by region and new index values computed, which produced a final set of 41 index values.

The index values were further adjusted for the estimated fraction of the poverty budget accounted for by housing (including utilities), that was set at 44 percent. This effectively created a fixed-weight interarea price index with two components: housing, and all other goods and services, where the price of other goods and services was assumed not to vary. This narrowed the range of index values. As the panel pointed out, the proposed procedure should not be viewed as the last word on the issue of adjusting poverty thresholds for the area differences in prices. Their procedure only accounts for differences in housing costs. It also does not account for differences within an area, differences in quality of a unit, or significantly higher housing costs in Alaska or Hawaii. The resulting indexes are shown in Table C3. For this report, the indexes are adjusted for each year of the CPS sample so that the average of the indexes across all persons is 1.00. For example, for 1997 the indexes were divided by a factor of 1.0252 to yield an average of 1.00 using the March 1998 CPS.

BLS Experimental Interarea Price Indexes

In an earlier study,²⁰ adjustments in expenditures for interarea price differences were based on experimental price index research performed at the Bureau of Labor Statistics (BLS) by Kokoski, Cardiff, and Moulton.²¹ These researchers used a hedonic methodology and monthly CPI-U price data for July 1988 through June 1989 to produce experimental interarea price indexes; indexes were computed for the 44 CPI publication geographic areas.²² These experimental interarea price indexes were created at the lowest level of CPI price data available and were aggregated to form index factors for 11 major expenditure categories. This was accomplished by weighting

lower level indexes using expenditure shares from CEX data. The resulting 11 expenditure categories comprise about 85 percent of total consumer spending. In order to account for the remaining 15 percent of expenditures, a residual category vector was approximated by taking the average of the 11 existing factors for each area. Although the interarea price indexes are experimental, there are no other suitable data currently available that can be utilized to estimate interarea price differences.

To obtain the price indexes for each of the 45 region/size areas used in the panel's report, Johnson et al. (1997) used the 12 region/size averages from the procedure in Kokoski et al. for each of the three smaller areas in each of the nine divisions. That is, the indexes for the small, medium, and large size metro areas in the Western region were used for areas with less than 250,000 people, 250,000-500,000 people, and 500,000-1,000,000 people in both the Mountain and Pacific divisions. Indexes for the larger areas (with 1,000,000-2,500,000 people and over 2,500,000 people) were obtained by taking the weighted average of the metropolitan areas located in each division that were represented in the interarea indices.

To compare the two methods, both sets of indexes were adjusted so that the weighted average for the 45 region/size areas was 1.0 and were designed to measure differences in prices between areas relative to the average of all other areas. The work by Johnson et al. compared the interarea consumer price indexes used by the panel with the BLS interarea price indexes by division and population size. The indexes were applied by division and population size to the thresholds calculated in an earlier paper. Although the BLS interarea price indexes include more expenditure categories than the panel's housing indexes, both methods produced similar indexes, with a correlation coefficient of 0.78.

Table C4 shows the different thresholds using these different adjustments. This table illustrates the main differences between the BLS interarea approach and the panel's housing index approach. Since the BLS approach is based on the Primary Sampling Unit (PSU) for the CEX, some metropolitan areas of similar size (e.g., Greater Los Angeles and San Diego) within the same region have different thresholds, while the housing index assigns the same threshold. In addition, since there are only four regions in the BLS approach, different regions of similar size (e.g., medium-sized cities in the Mid-Atlantic and New England regions) receive similar thresholds under the BLS approach, but different thresholds under the panel's approach. Finally, both adjustments cause the thresholds in nonmetropolitan areas to be less than the national average.

FOOD STAMPS AND SCHOOL LUNCH SUBSIDIES

Both receipt of food stamps and the amount received are reported in the Current Population Survey (CPS).

²⁰Johnson et al., 1997.

²¹Kokoski et al., 1994.

²²The KCM research is currently on hold. They are not official BLS published data.

Table C3. **Geographic Adjustments for Housing Costs in Experimental Poverty Thresholds***

Area and population size	Index value
Northeast	
<i>New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)</i>	
Nonmetropolitan areas and metropolitan areas under 250,000	1.128
Metropolitan areas 250,000-500,000	1.128
Metropolitan areas 500,000-1,000,000	1.148
Metropolitan areas 1,000,000-2,500,000	1.141
Metropolitan areas 2,500,000 or more	1.209
<i>Middle Atlantic (New Jersey, New York, Pennsylvania)</i>	
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
Midwest	
<i>East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)</i>	
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
<i>West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)</i>	
Nonmetropolitan areas and metropolitan areas under 250,000	0.861
Metropolitan areas 250,000-500,000	0.962
Metropolitan areas 500,000-1,000,000	0.981
Metropolitan areas 1,000,000-2,500,000	1.028
Metropolitan areas 2,500,000 or more (use areas 1-2.5 million)	NA
South	
<i>South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)</i>	
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 1,000,000-2,500,000	1.043
Metropolitan areas 2,500,000 or more	1.119
<i>East South Central (Alabama, Kentucky, Mississippi, Tennessee)</i>	
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
<i>West South Central (Arkansas, Louisiana, Oklahoma, Texas)</i>	
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 2,500,000 or more	1.005
West	
<i>Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)</i>	
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
<i>Pacific (Alaska, California, Hawaii, Oregon, Washington)</i>	
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

NA Not applicable.

* Table copied from Table 5-3, page 252: Constance F. Citro and Robert T. Michael (eds.) *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

Table C4. Comparison of Thresholds Using the BLS and NAS Geographic Adjustments: Various Areas
[Dollars]

Geographic area	1995 thresholds	
	BLS experimental interarea	NAS housing index
Reference threshold	15,561	15,561
Washington, DC.....	18,378	17,273
Greater Los Angeles.....	18,984	18,782
San Diego.....	17,973	18,782
Mid Atlantic		
Medium size metropolitan area.....	16,355	15,748
New England		
Medium size metropolitan area.....	16,355	17,724
East South Central		
Nonmetropolitan area.....	12,791	12,776
West South Central		
Nonmetropolitan area.....	12,791	13,242

Source: Johnson et al., 1997.

Receipt and amount of food stamps are also collected in the Survey of Income and Program Participation (SIPP). This benefit is reported similarly in both surveys. However, in the CPS, respondents are asked if they ever received food stamps in the previous calendar year. If they answer that they did, then they are asked to report the total amount received in that year. Respondents to the SIPP are asked to report receipt of food stamps on a monthly basis every 4 months for the entire panel length. If they report receipt of food stamps, then they report the monthly face value amounts.

In the CPS, we recorded that 10 percent of all people were in a family in which someone reported food stamp receipt sometime during the year 1991. In that same year, 12 percent of SIPP respondents reported receiving food stamps. The estimated average amount of food stamps received for each family is similar in the two surveys: \$1,951 in SIPP and \$1,909 in CPS. This average is comparable to administrative program data from the Food and Nutrition Service of the Department of Agriculture, where the average annual benefit per household equaled \$1,983 for 1991.

If we sum the value of total food stamp receipts across all families in the surveys, we record a total of \$12.4 billion in the CPS and \$14.8 billion in the SIPP for 1991. These figures, when compared to unpublished program spending totals of \$18.3 billion for the year 1991, suggest, perhaps not surprisingly, underreporting of food stamp receipt in both surveys. The aggregate value in the CPS for 1997 is \$12.3 billion. Figures from the CPS for 1997 show a slightly lower percentage of people receiving food stamps, 8 percent, with average amounts of those receiving benefits equaling \$2,087 per year.

School lunches, whether free, reduced price, or regular price, are reported differently in the two surveys. In the CPS respondents report the number of children who usually ate a school lunch in the previous calendar year, and

they indicate if that lunch was free or reduced price. Obviously, responses to this question depend on the respondents interpretation of the word usually. In the SIPP, the question is asked, "How many school lunches were eaten by the children per week?" This different question elicits different responses on school lunch participation. In 1991, we estimate that in the CPS only 32 percent of respondents reported that children in the family usually ate a school lunch, as compared to 40 percent in the SIPP.

The income value for the school lunch program for each participant family is calculated using this information and data on the annual subsidy for free, reduced, and full-priced meals. Information on the dollar amount of subsidies per meal is obtained from the Department of Agriculture (unpublished data). Again, however, the treatment differs in each survey. In the CPS, since no additional information is available, we must assume that all reported children ate a school lunch of the reported price scheme all year. In the SIPP, with subannual reports, we can more correctly apply the correct amounts of in-kind benefit to each family. The lack of information in the CPS results in an overestimation of amounts received. We calculate an average family lunch subsidy of \$302 in the CPS versus only \$232 in the SIPP.

Since fewer households reported receiving school lunches in the CPS, but we are imputing larger dollar amounts, the aggregate subsidies across all families are virtually identical in both surveys, \$5.3 billion for calendar year 1991. Total dollars spent by the school lunch program for that year were reported to be \$4.1 billion, suggesting that our estimates are overvaluing these amounts. For 1997, our estimates in the CPS show that 30.2 percent of all persons are in families with some children eating a hot school lunch and 45.3 percent of all persons in poor families. An aggregate amount valued from this program is \$5.8 billion in that year (see Table C5).

Table C5. Percent of Persons With Positive Family Amounts and Mean Annual Amounts, CPS: 1997

	All persons		Poor persons	
	Percent of people	Mean annual family amounts (dollars)	Percent of people	Mean annual family amounts (dollars)
Food Stamps				
All persons		174		1,012
With positive amounts	8.3	2,087	42.4	2,389
School Lunches				
All persons		101		315
With positive amounts	30.2	336	45.3	695
Housing Subsidies				
All persons		90		513
With positive amounts	4.2	2,149	19.2	2,675
Energy Assistance				
All persons		5		24
With positive amounts	2.5	210	11.5	207
Child Care - Model				
All persons		371		239
With positive amounts	12.6	2,944	10.0	2,383
Child Care - SIPP Medians				
All persons		679		431
With positive amounts	29.3	2,315	24.4	1,763
Child Care - AFDC				
All persons		415		287
With positive amounts	12.7	3,260	10.1	2,828
Work-Related Expenses				
All persons		1,138		404
With positive amounts	85.4	1,333	59.0	685
Medical Out-of-Pocket Expenses				
All persons		2,677		1,630
With positive amounts	94.0	2,847	79.8	2,042
Federal Income Taxes				
All persons		7,273		11
With positive amounts	76.1	9,554	3.4	334
Social Security Taxes				
All persons		2,996		373
With positive amounts	82.9	3,614	58.3	640
Earned Income Tax Credit				
All persons		314		997
With positive amounts	19.0	1,656	47.2	2,112
Net Return on Home Equity				
All persons		2,089		932
With positive amounts	57.5	3,917	30.8	3,204

Source: U.S. Census Bureau tabulations of March 1998 Current Population Survey data.

HOUSING SUBSIDY VALUATION

Rent subsidies for renters receiving subsidies and for those living in public housing, one of the noncash benefits valued in the March supplement to the CPS, are estimated as part of normal Census Bureau processing of the CPS microdata file. These values are currently estimated with a regression model that uses American Housing Survey (AHS) data from 1985, updated using the CPI Residential Rent Index. This section describes the current model, illustrates the results of applying this model to the original data, and compares the effects of using current updating procedures with the results of using more recent AHS data from 1993 (future work will examine 1997 data).

Current Method

The current model provides estimates of monthly housing costs for renters as a function of four variables. In essence, this is a very simple hedonic housing cost model. Monthly housing costs, the dependent variable, include both rent and utility costs. The four independent variables are:

1. The number of full baths.
2. The presence or absence of all of three kitchen appliances: refrigerator, dishwasher, and garbage disposal.
3. The presence of any of four problems: hole(s) in wall(s), hole(s) in floor, peeling paint, or rats.

4. An index of satisfaction with community services: police, hospital, public transportation, and shopping.²³

To get estimates of the effect of these independent variables on the rental cost, this model is estimated only for unsubsidized renters in two-bedroom units, the most prevalent type of rental unit. Unsubsidized renters are renters who report that they do not live in public housing, do not receive state or local assistance with housing costs and do not report their income for purposes of setting rent. Separate regressions were estimated for each of four Census Bureau geographic regions: Northeast, Midwest, South, and West. Subsidized renters are those who either live in public housing or receive state or local assistance with housing costs.²⁴ The regression coefficients are then applied to the housing characteristics of subsidized renters in the relevant region²⁵ to obtain an estimate of what the predicted monthly housing cost would have been in the absence of the subsidy. The difference between the mean predicted monthly housing cost and the mean out-of-pocket housing costs of subsidized renters in the designated region is the mean subsidy for a two-bedroom unit in that region.

This subsidy is then adjusted for family income and number of bedrooms. Renters were divided into three income categories. The categories and their adjustment factors are:

Family income	Adjustment factor
Less than \$6,000	1.25
\$6,000-9,999	1.15
\$10,000 or more	.48

The current model makes adjustments for the number of bedrooms. Units are divided into three categories: units with less than two bedrooms, units with two bedrooms, and units with more than two bedrooms. The adjustment factors for bedrooms are two region-specific ratios generated from the costs of nonsubsidized renters in the 1985 AHS data (see Table C6). The adjustment factor is the region-specific ratio of median monthly costs for the group divided by the median monthly cost for a two-bedroom unit.

²³One service, public schools, is not included in the index.

²⁴Renters who report their income for purposes of setting rent are included among subsidized renters, but renters who do not report their income for purposes of setting rent are included among nonsubsidized renters. Respondents with missing data in each of the four housing subsidy questions are not included in the original model.

²⁵Specifically, the monthly housing cost of each subsidized renter was computed by applying an equation where the estimated regression coefficients for nonsubsidized renters in two-bedroom units were applied to the characteristics reported by the subsidized renters in two-bedroom units.

Table C6. **Monthly Housing Costs (Rent and Utilities) by Number of Bedrooms and Region: 1985**

[Dollars]

	1 bedroom	2 bedrooms	3 bedrooms
	All renters		
Northeast	356	422	454
Midwest	271	364	405
South	297	369	449
West	368	468	599
	Nonsubsidized renters		
Northeast	391	455	503
Midwest	300	380	428
South	321	388	485
West	386	486	629

Source: U.S. Census Bureau tabulations of 1985 American Housing Survey data.

Updated Estimates

Having provided a description of the current measurement technique, we turn our attention to a comparison of estimated subsidies using AHS data from 1985 and 1993. Table C7 shows estimated 1993 subsidies for the entire United States using the 1985 AHS updated with the price index and 1993 AHS data for renters in two-bedroom units with family incomes between \$6,000 and \$9,999.²⁶ Results for other income groups and/or number of bedrooms can be computed using the adjustment factors given above.

For the United States as a whole, subsidized households with incomes between \$6,000 and \$9,999 who lived in two-bedroom units would have an estimated average subsidy of \$221 in 1993 if 1985 data are used and updated with CPI-U residential rent indices. However, if 1993 AHS data are used, similarly situated families in 1993 had an estimated subsidy of \$324. The CPI-U updated subsidy is \$103 less than the subsidy computed with current data. In relative terms, using the CPI-U rent indices to update the subsidy for 1993 underestimates the average subsidy for specified households (viz., two bedrooms, income between \$6,000- \$9,999) by 35 percent.

Regional Differences

Estimated subsidies are updated for 1993 using CPI-U ratios to provide comparisons between CPI-U index-updated subsidies and subsidies modeled on 1993 data. Differences between 1985 AHS index-updated and 1993 AHS subsidies range from \$78 (South) to \$135 (West).

²⁶In order to simplify the discussion and make the presentation clearer, in this appendix we show results only for this middle income category (i.e., \$6000-\$9,999). Recall that the adjustment factor for this group is 1.15. Results for other income categories and number of bedrooms are consistent with these results.

Table C7. Estimated Housing Subsidies for the United States and Regions: Two-Bedroom Units and Income \$6,000 to \$9,999

[Dollars]

	United States	Northeast	Midwest	South	West
1985 AHS¹					
Sample size	568	166	131	168	103
Subsidy amount (1993 dollars)	221	279	185	198	247
1993 AHS					
Sample size	646	192	153	200	101
Subsidy amount (dollars)	324	368	290	276	382

¹Updated using CPI-U residential rent indices.

Source: U.S. Census Bureau tabulations of 1985 and 1993 American Housing Survey data.

Table C8. Mean Monthly Housing Subsidies for Families by Selected Characteristics: 1993

	Sample size	Current subsidy ¹ (dollars)	Updated subsidy ² (dollars)	State level FMR ³ (dollars)
Overall	3,332	161	250	300
Family income less than 6,000	2,133	231	354	484
Family income 6,000 to 9,999	1,958	216	333	418
Family income 10,000 +	3,179	92	144	179
Married couple	547	122	191	195
Male householder	587	137	216	230
Female householder	2,198	176	273	342
Northeast	1,023	196	286	376
Midwest	820	129	224	252
South	917	156	232	252
West	572	164	270	338
Less than 2 bedrooms	1,991	137	218	232
2 bedrooms	2,194	159	244	283
More than 2 bedrooms	3,085	195	298	444
Less than 2 bedrooms				
Northeast	333	175	259	298
Midwest	515	103	189	180
South	481	129	198	179
West	362	141	231	296
2 bedrooms				
Northeast	628	197	277	352
Midwest	535	136	229	252
South	644	150	222	235
West	387	163	266	341
More than 2 bedrooms				
Northeast	911	223	330	558
Midwest	609	167	276	408
South	1,011	190	275	368
West	554	200	332	487

¹Method currently used based on 1985 American Housing Survey data.

²Method based on 1993 American Housing Survey data.

³Fair market rents (FMR) based on Urban Institute research.

Source: U.S. Census Bureau tabulations of March 1994 Current Population Survey data.

These results suggest that index-updated average subsidies underestimate average subsidies for specified households by 24 percent to 40 percent. These differences are substantial.

Most of the difference is reflected in the higher rents of nonsubsidized renters in 1993 than in 1985. For the South and Midwest, the average predicted rent for two-bedroom

units was approximately \$100 more in 1993 than it was in 1985. For the West and Northeast, it was approximately \$150 and \$180, respectively. The secondary factor is a lower average monthly cost in 1993 compared to 1985 for subsidized renters in 3 of the 4 regions: Midwest, (\$30), South (\$10), and West (\$20). In the Northeast, average

rent of subsidized households increased \$40,²⁷ which offset the effect of higher average rents among nonsubsidized renters. The initial conclusion that we draw from these data is that it is important to use current data rather than updating older data with Residential Rent Indices because the index-updating approach appears to underestimate subsidies.²⁸

The housing subsidies that are on the March CPS supplement file are based on subsidies estimated from the 1985 AHS, updated for inflation. As noted, the subsidies vary by region, number of bedrooms, and income of the family. We use the 1993 AHS and examine the effect of using these more recent data on poverty rates and aggregate expenditure. For example, the mean monthly family subsidy currently on the published file is \$161. The minimum subsidy is \$55, and the maximum subsidy is \$336. Using updated subsidies, the mean monthly family subsidy is \$250, while the minimum subsidy is \$99, and the maximum subsidy is \$556.

Alternatively, Fair Market Rents (FMRs) are available from HUD at a very detailed geographic level. Using a population-weighted average of the FMRs by state for 1993,²⁹ we estimate housing subsidies as follows. We assume the respondent's rent is the appropriate state-level average FMR. These FMRs vary by the number of bedrooms assigned to the respondent.³⁰ Then, the respondent's rent is assumed to be 30 percent of the households gross income, excluding the earned income of household members under age 18.³¹ The difference between the FMR and the respondent's rent is the subsidy estimate in this scheme. When we use FMRs at the state level to calculate subsidies, the mean monthly subsidy is \$300. Table C8

²⁷This \$40 approximates the difference between the 1993 and 1985 coefficients for the presence of specified problems. In 1993, the coefficient is positive. Although it does not meet the criterion for statistical significance, it does contribute to the subsidy estimates. It is not plausible that households in the Northeast pay an extra \$10 every month for the presence of rats, peeling paint or holes in the walls or floors. Obviously the variable is correlated with some omitted variable, and the model is misspecified.

²⁸Note that the residences in the 1985 national sample remained in the sample for the 1993 survey unless demolished or converted to nonresidential use. However, there were additional residential units in the 1993 AHS sample due to new construction.

²⁹Unpublished Urban Institute memoranda.

³⁰The CPS does not collect information on the number of bedrooms the family has directly. Rather, we estimate the number of bedrooms using the age, sex, and marital status of family members as specified by HUD occupancy rules. The Urban Institute, in the process of incorporating housing subsidies into their TRIM model, criticized our bedroom number assignment on several grounds. This appendix does not address the shortcomings of the Census Bureau's bedroom estimation, but takes the number of bedrooms given on the file.

³¹The income measure used in this comparison is a very rough approximation of the appropriate income to use in determining rent. HUD program rules allow various deductions to income, only some of which could be modeled in the CPS. Thus, the results for the state level FMR subsidy scheme are very preliminary.

Table C9. Aggregate Housing Program Expenditures
[Billion dollars]

	Overall	Public	Rental
Current subsidy ¹	10.7	7.0	3.6
Updated subsidy ²	16.6	10.9	5.7
State level FMR ³	19.9	12.8	7.1
Independent estimate ⁴	17.7	NA	NA

NA Not applicable.

¹Method currently used based on 1985 American Housing Survey data.

²Method based on 1993 American Housing Survey data.

³Fair market rents (FMR) based on Urban Institute research.

⁴Figure from HUD includes outlays for Section 8, Rent Supplements, Section 236, Rental Housing Development Grants, and Public Housing Programs.

Source: U.S. Census Bureau tabulations of March 1994 Current Population Survey data.

shows mean monthly subsidies at the family level, by selected characteristics, using the three methods.³²

Aggregate Expenditure

Updating alternative data sources for estimating rent subsidies has a dramatic effect on aggregate expenditures as shown in Table C9. Using data from 1993, we estimate that \$16.6 billion were spent on housing subsidies in 1993, as opposed to the \$10.7 billion estimated using the price-adjusted data. Public housing subsidies account for \$10.9 billion (66 percent) of aggregate expenditures, while rental assistance accounts for \$5.7 billion (34 percent) of program spending.³³ The FMR scheme shows \$19.9 billion in aggregate expenditures; \$12.8 billion for public assistance housing and \$7.1 billion for rent-assisted housing. The new estimates of aggregate expenditures compare more favorably with an independent estimate of \$17.7 billion in rental assistance.³⁴ Allocation between public housing and rental assistance is difficult, although the Urban Institute argues that the CPS underestimates rental assistance.³⁵ Aggregate expenditures are broken down in Table C9 to show variation according to various schemes.

³²This analysis is performed at the family level because official poverty is a family concept. There are valid arguments for estimating housing subsidies at the household level, but such estimates would be difficult to allocate among families in multifamily households. Such an allocation would be necessary to look at the effect of housing subsidies on poverty.

³³Using the old subsidy data, \$7.7 billion (65 percent) was estimated as public housing expenditure, while \$3.6 billion (35 percent) was estimated for rental assistance.

³⁴The independent estimate from HUD includes outlays for Section 8, Rent Supplements; Section 236, Rental Housing Development Grants; and Public Housing programs. Public Housing expenditures include an operating and a modernization budget, neither of which is related to market rent.

³⁵Various Urban Institute internal memoranda. Analysis of CPS data for calendar years 1991 through 1993 show a generally stable estimate of 1.7 - 1.9 percent of families (as defined by presence of family records in the CPS) having rental assistance. The percentage of families reporting public housing is more variable, from 2.7 percent in 1991 to 3.5 percent in 1993.

ENERGY ASSISTANCE FOR HEATING

The CPS collects information on whether households receive benefits from the government's energy assistance program and the amount received over the last 6 months. Given that this information is only reported for the winter months suggests that we are only collecting the heating portion of this program. The CPS reports that 2.5 percent of all people in 1997 were in a family where this benefit was received. Of all people classified as poor under the official measure, 11.5 percent of individuals reported receiving this benefit.

The SIPP, however, collects information on receipt of energy assistance in every month of the year. Asking the questions year round captures individuals who received help with cooling as well as heating bills. Respondents report if help was received and the monthly amounts received. From the SIPP, we estimate that 6 percent of all people were in a family where someone reported receipt of energy assistance; 28 percent of all people classified as officially poor reported this benefit. These percentages are considerably higher than those reported in the CPS, but, as noted, also include individuals who reported assistance with cooling bills. The average amount that families received across people in families with this benefit in 1991 was \$278 based on SIPP data.

For this application in the CPS, we use the amount of energy assistance reported by respondents for heating benefits only. When reported amounts are used in this way in the CPS, we estimate that the average amount received was \$210 in 1997. Aggregate reported figures for heating assistance in the CPS, summed across all families, equals \$0.5 billion in 1997, more than half of the \$0.88 billion dollars reported as the total heating benefits spent for the program in 1995.³⁶ Aggregate figures in the SIPP sum to \$1.5 billion in 1991, for both heating and cooling. This number is actually higher than published program information of a total of \$1.1 billion for heating benefits and \$27 million in cooling benefits in that year.

WORK-RELATED EXPENSES

Under the experimental measure of poverty two types of work-related expenses are subtracted from a family's resources: 1) child care expenditures, and 2) other work-related expenses. In this section we present three methods of valuing child care costs and one method of valuing other work-related expenses.

Child Care Expenditures

The first method of valuing child care expenditures involves using topical module data from the 1991 SIPP to estimate child care expenses for CPS families (the March CPS contains no questions on child care expenses). In the

SIPP, parents or guardians of children less than 15 years of age who were in the labor force or attended school during the reference period were asked about their child care arrangements and costs during the last month. The panel proposed that we deduct out-of-pocket child care costs from the income of families where both parents, or the only resident parent, reported being in the work force. They also recommended that expenses be limited to the earnings of the parent with the lower earnings, or to the cap on the dependent care tax credit (which is \$2,400 for one child or \$4,800 for two or more children – whichever is lower). While the panel suggested that we impute child care expenses to parents of children under 15 years of age, we impute such expenses only to parents of children under 12 years old because children age 12 and over are less likely to require child care arrangements outside of school.

We use a two-step procedure for estimating the expenses for each of two separate groups of families: two-parent families where both parents worked, and families with a single working parent. First, we estimate logistic regressions for the two groups to estimate the probabilities of incurring child care expenses based on the race/ethnicity of the head, the number of children of various ages, region, and family income. The two-parent equation also included a variable for the proportion of the family's earnings earned by the mother. Second, weekly expenses of working parents who paid for child care are regressed on the same set of explanatory variables using an Ordinary Least Squares (OLS) technique. The panel estimated such a model using data from the 1990 SIPP panel. We reestimated this same model using the 1991 and the 1992 SIPP panels (see Tables C10 and C11).

The logistic regression results from SIPP 1992 are used to establish the probability that a family in the CPS had incurred child care expenses. Based on this probability, the family is randomly selected to either have or have not incurred expenses. If the family is selected to have incurred expenses, the OLS regressions are then used to impute the amount of child care expenses of the CPS family, based on the family's characteristics. As mentioned above, imputed expenditures are limited to the earnings of the parent with the lower earnings, or to the cap on the dependent care tax credit — whichever is lower.

The second method for valuing child care expenses involves estimating logistic regressions described above to determine who incurs child care costs. Then we subtract dollar amounts from resources based on Aid to Families With Dependent Children (AFDC) and food stamps program child care deduction guidelines which take into account the number and age of children in the family. In particular, these programs have permitted parents to deduct from countable income some out-of-pocket spending for child care necessary for the parent to work or participate in training. In 1989, the maximum amount of this deduction was \$175 per month for each minor child aged

³⁶U.S. Department of Health and Human Services, 1997, p. 9.

Table C10. Logit Coefficients Predicting Whether a Family Incurred Child Care Expenses: 1990-1992

	Single-parent family			Married-couple family		
	1990	1991	1992	1990	1991	1992
Intercept	-4.832	-4.082	-2.523	-10.012	-10.937	-8.672
Black family head	0.048	-0.403	-0.137	0.218	0.079	-0.289
Hispanic family head.....	-0.081	-0.184	-0.207	0.460	0.152	-0.170
Number of children						
0-5 years old	1.017	1.187	1.074	1.028	0.874	1.127
6-11 years old	0.055	0.214	0.116	-0.051	-0.244	-0.107
12-15 years old	-1.062	-1.310	-1.018	-1.160	-1.076	-1.211
16-18 years old	-0.993	-0.381	-0.128	-0.603	-0.867	-0.259
Midwest.....	-0.111	-0.256	0.040	0.307	0.757	0.630
South.....	-0.083	0.097	0.078	0.332	0.826	0.853
West.....	-0.236	0.210	0.648	0.309	0.495	0.693
Log of family income.....	0.431	0.320	0.150	0.766	0.848	0.640
Percent of family's income earned by the mother	-	-	-	-1.771	-1.410	-1.167
Chi square	305.7	172.5	183.8	865.7	576.3	796.2
Number of observations.....	1,223	675	902	2,978	2,106	2,533

- Represents zero.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 1990-1992 panels.

Table C11. Ordinary Least Squares Regression Coefficients for Child Care Expenses: 1990-1992

	Single-parent family			Married-couple family		
	1990	1991	1992	1990	1991	1992
Intercept	-52.220	-105.122	-105.406	-221.396	-136.950	-332.173
Black family head	-6.875	-4.427	7.960	0.121	-9.531	-4.250
Hispanic family head.....	-6.223	-5.653	-3.343	-4.399	-4.602	-9.975
Number of children						
0-5 years old	16.492	38.446	40.590	23.637	29.497	59.364
6-11 years old	4.308	16.885	18.602	1.469	7.060	23.809
12-15 years old	-3.546	14.556	19.539	-2.223	9.139	-9.965
16-18 years old	1.523	11.443	-16.055	-5.931	1.670	18.428
Midwest.....	-11.676	0.123	-16.501	-6.713	-45.457	-7.558
South.....	-11.187	0.455	1.526	-2.940	-40.525	3.140
West.....	-8.728	11.315	1.707	6.662	-34.251	3.537
Log of family income.....	9.986	11.601	12.432	22.855	17.333	29.584
Percent of family's income earned by the mother.	-	-	-	29.864	43.572	54.660
R ²	0.1403	0.3014	0.1408	0.2422	0.1469	0.1388
Number of observations.....	455	237	306	1,071	702	826
Root MSE from unweighted regressions	32.588	35.166	68.033	34.579	65.998	93.247

- Represents zero.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 1990-1992 panels.

2 or older, and \$200 per month for children younger than 2. We base child care valuations on these figures because these program deductions for child care are the clearest normative statement of what the Federal government regards as a ceiling on the cost of child care necessary for employment. To take account of changing costs over time, we update them for inflation using the CPI-U.

Specifically, using this method we deduct child care expenses in the following way: 1) We impute who incurred child care costs via the logistic regression described in method 1; 2) For the first child under the age of 2 in a

family, we subtract the weekly AFDC deduction amount (\$200/4.348) for each week worked by the parent who worked the fewest weeks in the previous year. A smaller amount is subtracted for each additional child under 2 in the family because data from the 1993 SIPP indicates that expenses for additional children are smaller than for the first. The ratio we use is 0.486 because families paying for care of one child averaged \$74 in costs per week, and those paying for more than one averaged \$110. For each child from 2 to 11 years old, from family resources we subtract the weekly AFDC deduction amount (\$175/4.348)

for such children for each week worked by the parent who worked the fewest weeks in the previous year. Again, a smaller amount is subtracted for each additional child aged 2 through 11 equal to 0.486 of the dollar amount of the initial child. In families with children in both the under 2 and 2 through 11 age ranges, we subtract $(\$200/4.348)$ for the first child, and either $(\$200/4.348)*0.486$ or $(\$175/4.348)*0.486$ for each subsequent child—depending on the age of the child; 3) finally, total child care expenses are adjusted for inflation. See Table C5 for mean values of child care expenses for this method.

The third method for valuing child care expenses involves simply subtracting a fixed amount from the earnings of families with no nonworking parents and with children under the age of 12, and to limit this deduction to the earnings of the lower earner. We subtract fixed amounts equal to 85 percent of median annual expenses as reported in SIPP from these families. We use estimates from the 1993 SIPP panel updated to 1997 using the CPI for child care and nursery school. We calculate six separate medians depending on the number and age of children (see Table C12). This method imputes child care costs for all families with working parents and children. It follows the method used to impute other work-related expenses to families, described below.

Other Work-Related Expenses

The panel proposed subtracting a flat amount for other work-related expenses, to be updated annually for inflation. They recommended subtracting flat amounts rather than reported expenses because of the trade-off that people often make between housing and commuting costs. For example, a family may choose a less expensive home farther away from work (and thus incur greater work-related expenses) rather than a more expensive home closer to work. It makes little sense to subtract other work-related expenses for the former family but not the latter.

Table C12. **Median Child Care Costs by Number and Age of Children: 1991-1993**

[Dollars]

	1991 panel	1992 panel	1993 panel
One child under 12 years old			
No children under 5 years old . . .	1,820	1,560	1,820
One child under 5 years old	2,600	3,120	3,120
Two or more children under 12 years old			
No children under 5 years old . . .	1,560	2,080	2,548
One child under 5 years old	3,380	3,640	3,380
Two children under 5 years old . . .	4,160	4,680	4,836
Three children under 5 years old	4,940	7,150	5,200

Source: U.S. Census Bureau, Survey of Income and Program Participation, 1991-1993 panels.

Following the panel's recommendations, the flat amount we deduct is 85 percent of the median amount spent on other work-related expenses, as reported by SIPP respondents (no questions on other work-related expenses are asked in the CPS). This amount is restricted to not exceed the person's earnings. The panel used data from the 1987 SIPP, the most recent data available.³⁷ More specifically, the 1987 SIPP collected information on work-related expenses from people who had at least one employer in the reference period. Three types of expenses were identified:

1. Annual expenses— annual work-related expenses such as union dues, licenses, permits, special tools, or uniforms.
2. Mileage expenses— the number of miles usually driven to and from work in a typical week, for people who do some driving to work. An estimate of 22.5 cents per mile was used to convert mileage to expenses.
3. Other expenses— other expenses incurred in getting to and from work, such as bus fares or parking fees, in a typical week.

Tabulations from the 1987 SIPP panel indicate median weekly amounts of \$17 (in 1992 dollars) for these expenses; 85 percent of the median is \$14.42. The combined deduction of child care and other work-related expenses for working families with children under 12 years of age is capped to not exceed the earnings of the parent with lower earnings when using imputed child care expenses from methods 1 and 3, but not capped when using expenses estimated with method 2.

In order to evaluate the validity of our imputed work-related expenditures (for both child care and other work-related expenses), we compare our CPS estimates with expenses reported by SIPP families. We find that imputed values from the CPS data tend to be higher than SIPP numbers. The discrepancy results mainly from the fact that we assign these expenses to a higher percentage of people in the CPS than in the SIPP. This, in turn, is a function of the way we assign working status to survey individuals and their families. Recall that child care expenses are calculated only for families with no nonworking parents (i.e., where both parents work in dual-headed family or where the head of a single-headed family works). In the SIPP, if both parents (or the parent in a single-headed family) worked at least 1 week in the month when the child care topical module was administered, then that family is assigned to the no nonworking parent category. In contrast, using the CPS, we assign families no nonworking parent status if both parents (or the parent of a single-headed family) reported working at least 1 week in the

³⁷The 1996 SIPP panel includes an annual module on work-related expenses, thus allowing yearly updates in the future.

previous year. Clearly, the probability that parents will report having worked is greater if the accounting period is a year (as in the CPS) rather than a month (as in the SIPP). Thus, more people are assigned child care expenses in the CPS than the SIPP.

TAXES—FEDERAL AND STATE INCOME TAXES AND SOCIAL SECURITY PAYROLL TAXES

This section describes the methodology and procedures which were developed to estimate taxes associated with the income information on the March CPS microdata file. In all, four types of taxes were simulated: 1) Federal individual income taxes, 2) state individual income taxes, 3) property taxes on owner-occupied housing, and 4) social security payroll taxes.

A major element in the simulation system are statistical summaries of individual income tax returns compiled by the Internal Revenue Service (IRS). These statistics are made available in the IRS publication series, Statistics of Income (SOI). Some unpublished statistical summaries from the IRS were also used to develop these procedures. A third element was the AHS microdata file. This element was used to assign property taxes paid to the March CPS sample households residing in owner-occupied housing.

Federal Income Taxes

Simulation of Federal income taxes requires up to four separate operations. First is the formation and classification of tax filing units using household relationship, marital status, and dependency rules. Second, is the calculation of adjusted gross income for each of those units. Third is the simulation of amount of Federal income taxes paid. Finally, calculation of the earned income tax credit (EIC) is made, when applicable.

A Federal tax filing “unit” is defined as any individual (or married couple) with a certain amount received in self-employment income, in wages or salary, interest, dividends, rents and royalties, estates and trusts, or pension income in the previous year. The qualifying income levels were chosen because they either corresponded to tax laws or helped bring the estimated number of filing units on the CPS in line with SOI data.

The next step in the formation of Federal tax filing units is the assignment of dependency status. The algorithm for assigning dependency for each tax unit uses the following rules.

- All filing primary family householders and spouses are included as exemptions on their own tax returns.
- All children under age 15 who are members of the primary family are counted as dependents on the return of the family householder.
- Children aged 15 and over (except related subfamily members) with a total taxable income below a given amount are assigned dependency to the tax return of the primary family householder.

- Children aged 15 and over who are students are assigned dependency to the primary family householder regardless of income level.
- All other primary family members (except related subfamily members) within a given level of taxable income are assigned as dependents on the tax return of the primary family householder.
- Related subfamilies having at least one Federal tax filing unit are treated separately in the same manner as primary families.
- Members of a related subfamily containing no Federal tax filing unit are assigned dependency to the tax return of the primary family householder.
- All unrelated subfamilies are treated in the same manner as primary families.
- Primary and secondary unrelated individuals aged 15 and over are treated as exemptions only on their own tax returns.

All simulated filing units are classified into 1 of 3 return types. Married couples and persons whose marital status is “married, spouse absent in Armed Forces” are assumed to file joint returns. Unmarried family householders with dependents are assumed to file head of household returns. All other persons classified as Federal tax filing units are assumed to file as single individuals.

Computation of Adjusted Gross Income and Capital Gains

Adjusted gross income (AGI) for each simulated tax filing unit is calculated by summing the income amounts from all taxable sources plus an imputed amount for capital gains. The sources of CPS income included in AGI are wages and salaries, net farm and nonfarm self-employment income, net rental and royalty income, dividends, interest, estates and trusts, income from private and government pensions, unemployment compensation, and alimony.

Capital gains are imputed to tax filing units based on data obtained from a SOI public use file and reports summarizing information reported on Federal tax returns. These data provide estimates of the probability that a filing unit with given characteristics reported capital gains, and the mean amount of capital gains for that type of unit. The characteristics in this probability matrix are: level of AGI, type of return, and age of tax filer. We randomly assign capital gains: a random number (between 0 and 1) is generated for each filing unit; if that number is less than or equal to the probability of filing units in that matrix cell reporting capital gains, the mean amount of capital gains, as computed above, is added to that unit’s AGI. This procedure does not control on other characteristics that might affect the allocation of this source of income. As a

result of the fact that capital losses can be greater than capital gains for some groups, the net effect of capital gains on income for any particular group can be negative.

To simulate tax laws, a portion of social security income is included in AGI if the sum of AGI and half of the total social security amount exceed a given level. In these cases, the lesser of 1) one-half of the social security payments or 2) one-half of the difference between the modified AGI and the income limit is included in AGI.

Payments to individual retirement accounts (IRAs) are also simulated for the tax model. The May CPS pension supplement (updated to reflect changes in IRA regulations) is used to estimate probabilities of tax-filing units contributing to IRAs, and the average amounts contributed. Average IRA contributions are updated annually based on SOI data. These probabilities are then used to assign IRA contributions to individual tax-filing units on the CPS file. The IRA contributions are deducted from the total income received by the tax-filing units in order to compute AGI.

Computation of Taxable Income and Taxes Paid

Taxable income is computed by subtracting the estimated allowable deductions from AGI. The first step in this process consists of predicting which filing units itemized deductions. Homeownership is determined to be the most important variable available from the CPS for assigning itemization status to tax filers. First, a statistical match is made of between the March CPS and most recent AHS in order to assign a monthly mortgage amount and a property tax amount to each owner-occupied unit on the March CPS. Probabilities of itemizing for homeowner, tax-filing units are computed by size of monthly mortgage payment from the 1979 Income Survey Development Program (ISDP) test panel.³⁸ Probabilities for renters are computed by AGI level. These probabilities described are used to randomly assign itemization status within monthly mortgage (or AGI) intervals using a similar technique as used in the assignment of capital gains. The amount of itemized deductions for tax filing units is computed using a matrix showing the ratio of itemized deductions to AGI for all units by AGI interval, type of tax return, and presence of a home mortgage. The ratios of itemized deductions to AGI are computed using an SOI public use file and SOI data. Next, a standard deduction is estimated for each tax filing unit by multiplying the number of exemptions by a given dollar amount. Taxable income is then estimated by subtracting the itemized and standard deductions from AGI. Tax liability is then computed using the appropriate tax schedule for that simulated return type.

The dependent child care credit is simulated for the Federal tax model and subtracted from the total tax liability. This credit allows tax filers to deduct a portion of child care expenses while they work or look for work. Data

from the June 1982 CPS supplement are used to estimate probabilities of tax filers paying for child care. These estimates are updated annually from SOI data.

The earned income credit (EIC) is simulated for the tax model. These tax credits are used in the calculation of net Federal tax liability and computation of after-tax household income for filing units with one or more dependent children, less than a certain level in AGI, and earnings in a given range. Since the earned income tax credit can be larger than Federal tax liability, the net effect of Federal income taxes on certain groups in this report can be negative.

The simulation procedures do not capture variations in proportions of income paid in taxes within AGI intervals. The proportion of income paid in taxes for households with similar AGI amounts may differ relative to factors, such as race, age of household members, number of household members, and marital status. The extent to which these variations exist has not been measured; therefore, caution should be used when interpreting relatively small differences between the after-tax incomes of various subgroups of the population.

The lack of variation in proportions of income paid in taxes within AGI intervals is due in large part to the use of aggregate-level IRS data in the simulation process, as described previously in the appendix. The use of aggregate-level IRS data was necessary because the detailed information needed to simulate tax liability was not available on an individual-level basis to the Census Bureau. Published IRS estimates play a significant role in the simulation of Federal income taxes. Proportions of tax filers claiming capital gains, average capital gains, itemized deductions as a percentage of AGI, and average IRA and child care credit amounts are the major IRS-based components in the CPS Federal tax simulation procedure.

State Individual Income Taxes

For the purpose of this model, the definitions of tax filing units and AGI used for the estimation of Federal income taxes are also used for the simulation of state income taxes. The amounts of state individual income taxes paid are computed by developing a model of each state's income tax regulations. Information on the state tax systems was obtained from a publication entitled, *State Tax Handbook*. State tax rates and brackets are updated annually to reflect changes in state tax regulations. While every detail of each state's income tax system is not simulated, most of the important aspects are accounted for.

Property Taxes on Owner-Occupied Housing

Simulated property taxes are only used in the computation of net return on home equity in this report. Property taxes are already included in the out-of-pocket expenditures of owner-occupants so they are in the panel's thresholds. In order to simulate property taxes for owner-occupied housing units, the March CPS simulation file was

³⁸The ISDP was the precursor of SIPP.

statistically matched to a file from the AHS. Since the AHS file contained responses to questions on annual property tax expenses, the statistical match allowed the transfer of property tax amounts to CPS records when a CPS and AHS household were found to have similar matching criteria. The characteristics used to match the two files were: age of householder, state, metropolitan and central-city status of the household, household income, household size, number of living quarters, and the race, sex, and educational attainment of the householder. If there was no AHS household with the exact combination of characteristics as a particular CPS household, a match was then attempted at a new level that did not have quite as much detail. This was repeated until a match was found for every CPS household.

Households on the AHS file that did not answer the question dealing with property tax expenses were ineligible for the match. Since monthly mortgage expenses, which were used to simulate itemization status for Federal taxpayers, were also assigned to CPS households using this match, households that did not answer the AHS questions on that subject were similarly excluded from the match. Thus, any one AHS household could have been used more than once to impute data to CPS households.

Property taxes paid on secondary residences, such as vacation homes, could not be simulated. Also, the proportion of rent that pays the property taxes on renter-occupied housing units was not estimated. The estimation procedures for property taxes paid by homeowners produce estimates that do not correspond precisely with those available from the AHS. These differences are mainly the result of differing universes and use of the statistical matching procedure. Note that property taxes are considered a consumption item and are not deducted from income. They do play a role in determining the income value of owner-occupied homes, however.

Payroll Taxes

The social security payroll tax (FICA) was simulated using occupation of longest job and earnings data reported on the CPS. Social security payroll taxes were calculated directly from the reported CPS earnings using the social security payroll tax formula for 1997. Not all workers were assigned coverage under social security and, therefore, a small number were not subject to social security taxes. Since the late 1980s, we have assigned some Federal workers as FICA-covered and some as covered under the older noncovered Federal retirement system based on the age of the Federal worker. Unpublished aggregate statistics supplied by the Social Security Administration were used to make assignments for these workers.

MEDICAL CARE

In this report, we follow the panel's approach concerning the treatment of medical care in the poverty measure. For this approach, we analyze the impact of deducting

household obligations for the cost of medical care and health insurance out-of-pocket (MOOP) expenses from resources as the panel did. In this approach the treatment of MOOP is consistent on both sides of the poverty equation: the threshold and the resource sides. In general, this approach compares income less MOOP expenses to a threshold reflecting the costs of the basic bundle (FCSU), \$15,998 for the reference family in 1997 (see the FCSU threshold in Table C1). One additional approach, the addition of insurance values as resources where insurance coverage was subsidized by the government (i.e., medicare and medicaid) is also described below.

Medical Out-of-Pocket Expenses Deducted From Resources

In accordance with the panel's recommendations, we analyze the impact of medical expenditures in the determination of economic poverty by comparing resources less MOOP expenses to a threshold that does not include needs for medical care or health insurance. Also, like the NAS panel, we impute MOOP expenses in the CPS. A description of the imputation process follows.

To compensate for the lack of information on medical expenditures in the CPS, we use the same basic approach as the panel. However, we use a revised imputation model developed subsequent to the release of the panel's report.³⁹ For that model, the expenditure data (covering all components of MOOP expenses except individuals' premium payments for part B medicare) were obtained from the 1987 National Medical Expenditure Survey (NMES), aged to 1991. The imputation procedure assigned a predicted expenditure to each family based on the characteristics of that family and adjusted the imputed amount to ensure that, in the aggregate, total imputed out-of-pocket expenditures agree with aggregates expenditures estimated from an independent source.⁴⁰

The imputation model consists of three components. The first component of the model is the determination of whether or not a family incurred any MOOP expenses in the course of the year. A set of probabilities for different families was determined using NMES data that take account of insurance status, family size and income, race, and age of elderly householder. Whether a particular family would incur MOOP expenses is determined by drawing a random number from a uniform distribution. If that random number exceeds the probability of not incurring MOOP, the family is imputed positive MOOP expenses (see Table C13).

The second component of the model is to assign actual values of MOOP expenses to those who incur such

³⁹Betson, 1997a. The new method corrects for an error discovered subsequent to the report's publication.

⁴⁰Note that we do not adjust any other income source to meet a benchmark amount.

Table C13. Probabilities of NOT Incurring Medical Out-of-Pocket Expenses by Characteristics of Householder

Insurance	Characteristics			Nonelderly probabilities
	Family size	Income	Race	
Private health insurance	1 person	Not low income	White or other	0.065
			Black	0.041
		Low income	White or other	0.075
			Black	0.143
	2 or 3 persons	Not low income	White or other	0.061
			Black	0.083
		Low income	White or other	0.012
			Black	0.012
	4 persons or more	Not low income	White or other	0.031
			Black	0.024
		Low income	White or other	0.003
			Black	0.006
Public health insurance	1 person	Not low income	White or other	0.397
			Black	0.606
		Low income	White or other	0.219
			Black	0.628
	2 or 3 persons	Not low income	White or other	0.371
			Black	0.408
		Low income	White or other	0.212
			Black	0.279
	4 persons or more	Not low income	White or other	0.237
			Black	0.507
		Low income	White or other	0.256
			Black	0.345
No insurance	1 person	Not low income	White or other	0.378
			Black	0.482
		Low income	White or other	0.248
			Black	0.420
	2 or 3 persons	Not low income	White or other	0.151
			Black	0.194
		Low income	White or other	0.103
			Black	0.128
	4 persons or more	Not low income	White or other	0.043
			Black	0.126
		Low income	White or other	0.036
			Black	0.213
	Age	Family size	Income	Elderly probabilities
	under 75	1 person	Not low income	0.167
			Low income	0.023
		2 persons or more	Not low income	0.101
			Low income	0.016
75 or over	1 person	Not low income	0.087	
		Low income	0.022	
	2 persons or more	Not low income	0.054	
		Low income	0.017	

Source: Betson, 1997a.

expenses. The panel assumed that the cumulative distribution of medical expenses could be described by a logistic function. They estimated the parameters based on the following equation:

$\ln(c/(1-c)) = a + bX(h) + g \ln(\text{moop}) + d X(h) * \ln(\text{moop}) + e$
 where $\ln(\text{moop})$ = natural log of MOOP spending and c is the percentile in the cumulative distribution of MOOP in the NMES data. The description of variables and the estimated regression results are shown in Tables C14 to Table C16. This information is then used to assign a value of

MOOP to each family. The value of the expense is determined from the distribution of expenditures in NMES using a stochastic approach based on the following formula:

$$M = \exp\{(\ln(\text{rn}2/(1-\text{rn}2)) - a - b X(h))/g\}$$

Where:

- M = MOOP
- rn2 = random number drawn from a uniform distribution
- X(h) = a vector of family characteristics (age, race,

Table C14. Description of Independent Variables Used in Medical Out-of-Pocket Expenditure Equations

Lnmoop	Log of medical out-of-pocket expenses
Public	Equal to 1 if insured by medicare or medicaid only, 0 otherwise
Unins	Equal to 1 if uninsured, 0 otherwise
Fs23	Equal to 1 if family size is 2 or 3
Fs4m	Equal to 1 if family size is 4 or more
Fs2m	Equal to 1 if family size is 2 or more
Age75	Equal to 1 if reference person is 75 years or older
Nonpoor	Equal to 1 if the ratio of the family money income to poverty line exceeds 1.5
Black	Equal to 1 if race of head is Black
Publmp	Lnmoop * Public
Unlmp	Lnmoop * Unins
Nplmp	Lnmoop * Nonpoor
F23lmp	Lnmoop * Fs23
F4mlmp	Lnmoop * Fs4m
F2mlmp	Lnmoop * Fs2m
A75lmp	Lnmoop * Age75

Source: Betson, 1997a.

Table C15. Regression Coefficients for Nonelderly Population

	Coefficient	t statistic
Constant	0.9028	37.595
Lnmoop	1.2549	89.848
Publmp	-0.4039	-28.007
Unlmp	-0.1304	-9.467
Nplmp	0.0644	5.441
F23lmp	0.0921	8.338
F4mlmp	0.1491	11.912
Bklmp	-0.0692	-6.290
Public	1.2560	45.142
Unins	1.0070	44.449
Fs23	-0.8702	-45.427
Fs4m	-1.1897	-58.434
Nonpoor	-0.1913	-9.533
Black	0.3866	20.215
R ²	0.9227	

Source: Betson, 1997a.

income, and insurance coverage) that varies by elderly or nonelderly status

a, b, g = parameters estimated from the equation as noted above.

The most straightforward component is the assignment of medicare part B premiums to families with elderly members in the CPS. This is necessary because the expenditure data from NMES that formed the bases of the imputation model did not capture these out-of-pocket costs. For each elderly person in the family who was not covered under medicaid, we assign a fixed amount of money to the family equal to the legislated part B premium amounts for

each year.⁴¹ People with medicaid coverage are assumed not to incur the costs of the part B premiums because that program (by and large) covers that obligation.

The final value of MOOP expenses is computed as the sum of the medicare part B premiums and the imputed value M, adjusted for price changes and calibrated to the independent control totals. The aggregate totals used were developed from a variety of sources. Overall they pertain to the aggregate total for 1992 used by the panel, adjusted to other years according to changes in the CPI-U

⁴¹Social Security Administration, 1997, Table 2C1, p. 107.

Table C16. Regression Coefficients for Elderly Population

	Coefficient	t statistic
Constant	0.5079	25.777
Lnmoop	1.2170	94.459
Fs2m	-0.4655	30.387
Age75	-0.2682	-3.837
Nonpoor	-0.6364	-12.750
Nplnp	0.4410	-14.151
F2mlmp	-0.1610	-23.768
A75lmp	-0.0515	-31.019
R ²	0.9458	

Source: Betson, 1997a.

Table C17. Aggregate Control Total for Medical Out-of-Pocket Expenses Deducted From Resources

[Billion dollars]

Year	Aggregate	Medicare part B	Elderly MOOP	Nonelderly MOOP
1990.....	187.89	8.56	42.13	137.19
1991.....	204.28	9.31	45.81	149.16
1992.....	219.40	10.00	49.20	160.20
1993.....	232.44	10.59	52.12	169.72
1994.....	243.52	11.10	54.61	177.81
1995.....	254.49	11.60	57.07	185.82
1996.....	263.37	12.00	59.06	192.31
1997.....	270.76	12.34	60.72	197.70

Source: U.S. Census Bureau calculations and Betson, 1995b.

for medical care.⁴² These totals were disaggregated into three components (out-of-pocket medical costs toward medicare part B premiums, other MOOP expenses incurred by families with an elderly reference person, and MOOP expenses incurred by families not containing an elderly reference person). In our calculation, the totals for elderly and nonelderly were calibrated separately. Generally, the model tends to underestimate the out-of-pocket spending of the nonelderly and overestimate the spending of the elderly compared with the aggregates we used. For example, to match the aggregate values for 1997, we multiplied nonelderly expenditures by a factor of 1.179 and elderly expenditures by a factor of .8257. Furthermore, this is the only component of the poverty measure that is calibrated to an administrative control total, and thus adjusted for errors in reporting and sampling.

With this method, we estimate that 94 percent of all people in the CPS were in a family with at least some MOOP expenses. The average assigned amount spent in 1997 in the CPS was \$2,847. Further, 80 percent of poor people were allocated these expenses, which averaged \$2,042 (see Table C5). Since all amounts were calibrated to aggregate totals (see below) the aggregate-spending total was calculated to be \$271 billion for 1997 (see Table C17). It is important to note that these amounts are large and have a significant effect on poverty rates.

Including the Value of Health Insurance in the Measure of Resources

The procedure published annually since the late 1980s by the Census Bureau⁴³ applies a fungible cash value to medicare and medicaid benefits. The March supplement collects information on the number of persons who were covered by medicare and/or medicaid at any time during the previous calendar year. For the purpose of preparing these estimates, it is assumed that anyone who was covered at any time during the year was covered for the entire year. The income value of benefits from these programs is defined as the fungible value of the benefits; that is, these benefits are counted as income to the extent that they free up resources that could have been spent on medical care.

To make this calculation, a separate amount representing basic food and housing requirements is determined based on the cost of the Department of Agriculture's Thrifty Food Plan and a cost of housing based on the HUDs FMRs. The implicit standard used here is different from those used either in the official thresholds or the panel's proposed thresholds. The value of benefits from these programs is based on mean program outlays by state and risk class, such as the elderly and blind or disabled individuals.

⁴²Betson, 1995b.

⁴³U.S. Census Bureau, 1993 and 1998.

The fungible value of public insurance benefits is then estimated by comparing a family resource measure that includes in-kind benefits, such as food stamps and housing subsidies, with the cost of basic food and housing requirements. If family resources do not cover these basic needs, then no addition is made. Otherwise, the insurance benefit is valued as the amount by which the family's resources exceed the cost of basic food and housing requirements up to the full amount of the benefit.

In order to include these values in a poverty measure, we add the fungible value of public health insurance to income and compare that value of resources to the official poverty thresholds. These estimates are shown in Table A9.

OWNER-OCCUPIED HOUSING

The panel's treatment of shelter (not including utilities) is the same for owners and renters. For the thresholds, only out-of-pocket expenditures are included.⁴⁴ Thus, although the treatment of owners and renters is the same in terms of using out-of-pocket expenditures for the thresholds, homeowners with low or no mortgages are not being treated in a comparable way as homeowners with mortgages or as renters in terms of their shelter consumption.⁴⁵ While homeowners with low or no mortgages have relatively low out-of-pocket shelter expenses, their consumption is expected to be more like that of other homeowners and renters. For such low mortgage households, their needs are being met through the implicit cost of the equity investment in their owned housing units. If reference families were primarily composed of homeowners with low or no mortgages, the out-of-pocket shelter expenditures used in the production of the thresholds would be relatively low compared to their expected consumption. This would result in an underestimate of their shelter consumption costs because it ignores the implicit cost of homeowners equity from ownership of the housing unit.

If the reference family were primarily composed of homeowners with newer mortgages, their out-of-pocket shelter expenditures would be relatively high as compared to the expenditures of other owners and renters. If this were the case, an overestimate of the cost of shelter consumption could result. Using the out-of-pocket expenditures for owners with mortgages could also result in an overestimate of shelter costs because owners with mortgages are allowed to take a tax deduction for mortgage

interest paid, thus reducing their true costs for shelter. Finally, the implicit benefit of house price appreciation, which is one of the primary advantages of homeownership, is ignored.

For resources, the value of the flow of services that owners obtain from their homes is not accounted for in the panel's estimates. Thus, owners with low or no mortgages have more of their incomes available for the consumption of other items. As noted by the panel,⁴⁶ excluding some value for this implicit income is to underestimate these homeowner's resources relative to their poverty thresholds. Such an approach has interesting implications for elderly households who own their homes and do not have mortgages or have very low mortgage interest payments. This treatment of the elderly means that households living in expensive houses with substantial wealth, and hence implicit income in the form of owner's equity, are just as likely to be classified as poor as those in small inexpensive units (*ceteris paribus*). If we assume that elderly households can transform their home equity into a flow of guaranteed income using a reverse annuity mortgage, this equity could be used to increase their resources.

Following this approach, we assume that this implicit income could be used to meet one's basic needs. As noted by the panel,⁴⁷ some analysts⁴⁸ think that it may not be appropriate to add the full net imputed rent to resources, especially for the elderly. The panel stated that a downward adjustment to the value for a larger-than-needed home would be appropriate, but there appears to be little agreement concerning what the adjustment would be. One approach suggested is to cap the amount of the implicit income at the level of the shelter component in the poverty thresholds.⁴⁹

In this section, we describe two additional approaches for estimating shelter costs for the thresholds, and one approach for estimating a value for the flow of services from owner-occupied housing. For the thresholds, we compare out-of-pocket shelter expenditures with estimated shelter costs based on a hedonic regression equation and shelter costs based on reported rental equivalence by homeowners. The flow of services for resources is estimated as the net return to home equity. Each of these methods was briefly reviewed and supported in theory by the panel in their report. However, the panel produced no estimates based on these approaches. Participants at a 1998 Brookings workshop on Housing and Geographic Issues in the Measurement of Poverty supported our exploration of these approaches for poverty measurement.

⁴⁴For renters, shelter expenditures include those for rent paid, repairs and maintenance, and tenants insurance. For homeowners, shelter expenditures include those for mortgage interest, property taxes, maintenance, repairs, and homeowners insurance; mortgage principal payments are not included.

⁴⁵Citro and Michael, 1995, p. 148.

⁴⁶Citro and Michael, 1995, p. 245.

⁴⁷Citro and Michael, 1995, p. 246.

⁴⁸For example, Ruggles, 1990.

⁴⁹Citro and Michael, 1995, p.246.

Valuing Shelter for Homeowners in the Thresholds

As noted earlier, for owners, whether the family has a mortgage or not greatly affects out-of-pocket shelter expenditures, as does the mix of homeowners and renters among the reference families. Using 1993-1997 CEX quarterly Interview data, we find that approximately 75 percent of the reference families live in owner-occupied housing.⁵⁰ About 64 percent of the reference families live in owner-occupied housing and have a mortgage. Mortgage interest payments account for about 69 percent of the out-of-pocket expenditures of owners with mortgages. Other expenditures include property taxes (20 percent), maintenance, repairs, and related goods and services, such as homeowners insurance (11 percent). Since mortgage interest is a substantial portion of the out-of-pocket expenditures paid by many owners, thresholds will tend to rise and fall with the movement of mortgage interest rates. In addition, larger mortgage interest payments are associated with families living in newer, larger housing units located in high amenity neighborhoods. This means that thresholds will tend to be quite high when reference families have higher interest payments and live in such neighborhoods.

The panel acknowledged some of the problems associated with using actual out-of-pocket shelter expenditures as reported in the CEX; however, they used these expenditures for processing convenience. They stated that a preferable definition would include actual outlays for mortgage payments, taxes, insurance, and maintenance and repairs, together with an imputed amount for the estimated rental value of the home net of such outlays. Such a definition would treat homeowners with low or no mortgage payments in a comparable manner with other homeowners and renters.⁵¹ By following such an approach, one could expect that the implicit cost of housing consumption of owners with low or no mortgages would more appropriately be accounted for.

In this section, we describe two methods that we used to value the shelter consumption of reference families: rental equivalence and estimated shelter costs (not including utilities) based on a hedonic regression model. Both methods have been previously presented⁵² and used by a BLS/Census Bureau research team,⁵³ but refinements to the hedonic method have been introduced for this report.

The rental equivalence of owner-occupied housing is based on the responses of owners to a specific question, "If someone were to rent your home today, how much do

you think it would rent for monthly, unfurnished and without utilities?" For homeowners, this value replaces their reported out-of-pocket expenditures. In an earlier study,⁵⁴ rental equivalence values reported in the 1995 CEX and the 1995 Consumer Price Index Housing Survey were compared and found to result in similar average values for like families. We are unaware of other Federally sponsored surveys in which the rental equivalence question has been asked. Whether owner-occupants are accurate evaluators of the rental values of their units has not been examined based on our search of the literature.⁵⁵

For hedonic regression-pricing models, observed expenditures (e.g., rental costs) for shelter are regressed on explanatory variables representing the individual characteristics of the housing, and the regression coefficients are estimates relating to the implicit marginal prices of these characteristics. For our study, the resulting coefficients from the renter regression are used in combination with the characteristics of the owner units to estimate owner costs for shelter. Thus, this approach results in an estimate of owner's shelter costs in an average community using the characteristics and rent paid by renters with like housing characteristics. Defining shelter costs this way for owner-occupants contrasts with the panel's recommendation that defined owner shelter costs as the sum of the actual outlays for mortgage payments, taxes, insurance, and maintenance and repairs, plus an imputed amount for the estimated rental value of the home net of such outlays. We decided to model owner shelter costs so that owner and renter shelter costs would be comparable, rather than to allow owners with high mortgage interest payments and other large expenditures to be different from other homeowners and renters living in similar types of dwellings and in the same areas. In addition, basing owner shelter costs on the actual outlays when the estimated shelter costs are lower could mean that some owners could quite easily be considered poorer than renters only because these families own their homes and their out-of-pocket expenditures are higher. We thought it was counterintuitive that owners would be more likely to be poor than would renters, given the same amount of housing and other expenses. Furthermore, our approach makes thresholds less sensitive to fluctuations in interest rates and decisions to refinance.

The shelter expenditures paid by renters are the basis for the dependent variable in the model. Shelter expenditures for renters include rent paid and expenditures for maintenance, repairs, and tenants insurance. For this model, owners' estimated shelter costs are based on a semilog regression of renters' shelter expenditures on

⁵⁰The homeownership rate for all consumer units in the CEX is 63.4 percent. Thus, the reference family is more likely to own its home than families on average. Data from the quarterly Housing Vacancy Survey indicates that the National homeownership rate is 64.8 percent for 1993-1997, comparable to the rate produced using the CEX.

⁵¹Citro and Michael, 1995, p. 148.

⁵²Johnson et al., 1997.

⁵³Short et al., May 1998.

⁵⁴Johnson et al., 1997.

⁵⁵On a related topic, Follain and Malpezzi, 1981, examined the accuracy of owner-occupants concerning the market value of their homes using hedonic methods and the Annual Housing Survey. They found that the average over-occupant downwardly biases its estimate of the market value by about 2 percent.

selected housing and location characteristic variables. Malpezzi and colleagues⁵⁶ and others⁵⁷ have found that a semilog regression fits the hedonic price-characteristics relationship for housing fairly well. To be included in the regression sample, renters are identified as consumer units in the CEX database if they report positive out-of-pocket shelter expenditures, do not receive rent as pay, and do not live in government subsidized or public housing. Owners are identified as those owning their dwelling and having a positive value for out-of-pocket shelter expenditures (as defined for the basic threshold definition), or a positive expenditure for rental equivalence. The requirement of some positive owner expenditure is added to ensure that the owner sample is actually composed of owners.

The housing unit characteristics selected for the sample are based primarily on those used previously in the literature.⁵⁸ The general hedonic regression specification includes variables representing: structural characteristics of the dwelling, location characteristics, contract characteristics, a neighborhood characteristic, and an interview characteristic. Among the structural characteristics are age of the dwelling, type of dwelling,⁵⁹ number of bedrooms, number of complete baths, number of rooms other than bedrooms and baths, type of heating,⁶⁰ and other amenities.⁶¹ Squared and interaction terms for some of these variables are also included in the model. Location is represented by geographic sampling areas or primary sampling units. The contract characteristics that we include are whether utilities were included in the rent, whether the consumer units dwelling has a swimming pool, tennis court, barn or stable, guesthouse, greenhouse, or off-street parking. According to Messe and Wallace,⁶² the age of the dwelling typically proxies for neighborhood effects (established community, older trees, etc.) as well.⁶³ ⁶⁴ In most other hedonic models of housing, dwelling quality variables are also included;⁶⁵ such data are not currently collected in the CEX.

⁵⁶Malpezzi et al., 1998.

⁵⁷See Gillingham, 1975; Moulton, 1995; Ozanne and Malpezzi, 1985; and Thibodeau, 1995.

⁵⁸See, for example, Follain and Malpezzi, 1981; Malpezzi et al., 1998; Meese and Wallace, 1997; Ozanne and Malpezzi, 1985; Moulton, 1995; and Thibodeau, 1995.

⁵⁹Dummy variables for type of dwelling include: detached, row house, end unit townhouse, duplex, numplex, garden apartment, high rise apartment, flat, or mobile home.

⁶⁰Dummy variables for type of heating include: gas, electric, oil, or other.

⁶¹Dummy variables for amenities include: has swimming pool, tennis court, barn or stable, guesthouse, porch, terrace, patio, apartment, off-street parking, window air-conditioning, or central air-conditioning.

⁶²Meese and Wallace, 1997, p. 54.

⁶³Malpezzi et al., 1998, used race as a proxy for measuring neighborhood effects.

⁶⁴A complete list of variables for each time and subregion sample is available upon request.

⁶⁵See Thibodeau, 1995, for variables that have been used to proxy housing quality using the American Housing Survey data.

A variance components model was used to estimate the hedonic equation for eight regions of the country and for two time periods. This model was used because we wanted to account for the correlation of reports when a consumer unit was in the data file more than once and we wished to use all of the interviews. Because this last requirement meant that we had an unbalanced design, we needed a procedure that would account for this.⁶⁶ In the CEX, consumer units can be in the data file from one to four times, depending upon when and how often they participate in the Interview Survey. Since ultimately we wanted to produce the thresholds for 1995, 1996, and 1997, although only the 1997 threshold is used in the main part of this report, we needed data from 1993 through 1997. To conduct the regression analysis we used all the reports, regardless of family type, in order to maximize our sample size.

The rent regression sample included data from 31,122 interviews. This sample was divided into two samples representing: (1) 1993 Quarter 1 through 1996 Quarter 1, and (2) 1996 Quarter 2 through 1997 Quarter 4. These two samples were used because in 1996 Quarter 2 a new sample design for the CEX was fully implemented.⁶⁷ The eight regions were based on dividing the four Census Bureau regions of Midwest, Northeast, South, and West into large and other primary unit subsamples. Our regression results reveal that accounting for the fact that consumer units are in the data file more than once is significant ($Pr > Z$ is 0.0001 for all models). Conducting the analysis for the regional subgroups was also important based on the results that some of the significant regression coefficients are positive for some regional subgroups and negative for others.⁶⁸

To evaluate how well the model estimated the actual shelter expenditures of renters, we used the predicted values from the regression and adjusted this amount to account for the functional form of the model.⁶⁹ The correlation between the regression renters' estimated and their actual expenditures is 0.93. The correlation coefficient for reference family regression renters is 0.94.

Means and medians of quarterly shelter expenditures, out-of-pocket, rental equivalence, and estimated shelter costs based on regression analysis have been produced for consumer units with two adults and two children for both owners and renters.⁷⁰ These were produced so that we could better understand how the mix of renters and owners with and without mortgages in our sample could influence shelter costs and ultimately the experimental

⁶⁶The SAS procedure Proc Mixed was the most appropriate procedure for this application.

⁶⁷The new design was introduced in 1996 Quarter 1, but no data were collected under the new design in January of that year.

⁶⁸Results from the regression models are available upon request.

⁶⁹See Greene, 1990, p. 168 and Thibodeau, 1995, p. 442 for a description of the adjustment. Thanks are extended to Ralph Bradley and Anthony Yezer for discussions concerning this issue.

⁷⁰Tables with the means and medians are available upon request.

Table C18. Reference Family Thresholds Based on Different Approaches to Estimate Shelter Costs

[Dollars]

	FCEstU estimated shelter costs	FCSU out-of-pocket expenditures	FCReqU reported rental equivalence
1995	15,214.35	15,544.58	17,211.81
1996	15,557.25	15,743.76	17,670.69
1997	15,808.69	15,998.32	18,162.22

Source: Bureau of Labor Statistics tabulations of Consumer Expenditure Survey data.

poverty thresholds. For both means and medians, shelter out-of-pocket expenditures are lower for renters than are those for all owners combined (including both owner-occupants with and without mortgages). Mean renter quarterly expenditures from 1993 through 1997 for the reference family are \$1,473. The lowest mean out-of-pocket shelter expenditures are for owners without mortgages—\$623. This is in sharp contrast to the mean for owners with mortgages—\$2,203. Renters’ mean quarterly out-of-pocket expenditures are about 74 percent of mean owner expenditures (medians are about 85 percent). Owners without mortgages have out-of-pocket shelter expenditures that are 28 percent of that of owners with mortgages.

The next highest values for owners are those based on the regression analysis estimates and the highest are those based on rental equivalence responses. Again, differences between owners with and without mortgages emerge. The reported rental equivalence of owners without mortgages is 72 percent of the mean value reported by owners with mortgages. Model-based estimates for shelter costs for owners without mortgages are 76 percent of expenditures for renters. For all owners, the out-of-pocket shelter expenditures are about 78 percent of the average rental equivalence while the estimated shelter costs are lower at 66 percent of rental equivalence. The closer relationship between out-of-pocket expenditures and reported rental equivalence is not surprising if, as might be expected, respondents answer the rental equivalence question with respect to their neighborhoods and current shelter costs. Houses with higher mortgages are likely to be in neighborhoods with more amenities.

Poverty thresholds using each of the three methods to determine shelter costs are presented in Table C18. As expected, given that the estimated shelter costs for owner-occupants with mortgages are lower than are their out-of-pocket expenditures and the fact that the a sizable majority of the reference families have mortgages, the thresholds with the estimated owner shelter costs are lower. For 1997, the threshold based on estimated shelter costs for the reference family is \$15,809. The next highest thresholds are those based on out-of-pocket expenditures; for 1997 the threshold is \$15,998. The highest thresholds are those based on the rental equivalence reported by owners; for 1997 the threshold is \$18,162. The same pattern holds in 1995 and 1996.

Net Return to Home Equity Added to Resources

Homeowners with a positive amount of home equity receive a benefit in the form of housing services that is not generally counted as income. In this report, we apply a rate of return to the estimated amount of home equity; that is, we treat equity in owned home as an asset from which the owner receives implicit interest income.

The March CPS supplement collects information on whether the housing unit is owned or rented, but does not collect information on home equity. The rate of return approach is implemented by using the statistical match to the AHS based on age of the householder, state, SMSA, central city status, income, household size, number of living quarters, race-sex-education of the householder, and presence of own children. Data taken from the AHS include: monthly mortgage amount, annual property taxes, market value of residence, market value of land if the dwelling was a mobile home and they own the land upon which the home sits, balance remaining on mortgage, and an indicator of whether this unit is part of a condominium or cooperative. The return to home equity value of the house was determined by multiplying the market value of the home (plus the market value of the land if the dwelling was a mobile home) by a rate of return. The estimate of the amount of income derived from home equity is dependent on the rate of return that is chosen. The rate chosen is the average rate of return on high-grade municipal bonds from the Standard and Poors series. Because homeowners pay property taxes, the final estimate of the amount of income derived from home equity is made equal to the imputed return less the amount of property taxes paid.

THE UNIT OF ANALYSIS

The current demographic unit of analysis used by the Census Bureau in the CPS for measuring poverty is the family. The official poverty thresholds also assume that the family is the primary economic unit for poverty classification. Defining this unit relies on specific definitions of family and nonfamily relationships within a household. The Census Bureau defines a household as all the persons who occupy a housing unit, where a housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room in which the occupants: (1) live separately from any other persons in the building, and (2) have direct

access from the outside of the building or through a common hall. One person in each household is designated as the householder, and this is usually the person, or one of the persons, in whose name the home is owned, being bought, or rented. Other household members are characterized according to their relationship to this householder, or reference person, by asking the “relationship to reference person” question. A family is defined as a group of two or more persons related by birth, marriage, or adoption who reside together; such persons are usually considered members of one family. A household may consist of one family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements.

The current official poverty measure uses three distinguishable units of analysis: (1) primary families, (2) unrelated subfamilies, and (3) unrelated individuals aged 15 or older. The primary family in a household includes everyone in the household related to the householder. An unrelated subfamily includes persons who are not related to the primary family but who are related to each other as (1) husband and wife or (2) parent(s) and never-married child(ren) under age 18. An unrelated individual is a person aged 15 and over in a household who is not a member of a primary family or an unrelated subfamily, whether living alone or with others in the household.⁷¹ The poverty status of an individual is ascertained by comparing the sum of the incomes of all members of that person’s primary or unrelated subfamily to the appropriate poverty threshold, or by comparing the income of an unrelated individual to the appropriate poverty threshold. The current use of family as the unit of analysis has a normative basis also reflected in some Federal law and program rules. Family members are expected to share resources to a degree that unrelated persons are not.

Persons Not Officially Related to the Householder

Cohabiting couples. The category unmarried partner was implemented in the relationship to reference person question by the Census Bureau to identify cohabiting couples beginning in the 1990 Census of Population and Housing, the 1995 CPS, and the 1996 SIPP. An unmarried partner is defined as a person who is not related to the householder, but who shares living quarters and has a close personal relationship to the householder. Unmarried-partner couples are identified in these data collection systems only if one of the partners is the householder. A review of these data suggests that this direct measure of cohabitation in the CPS yields relatively low estimates of the prevalence of cohabitation. For example, in 1995, estimates from the National Survey of Family Growth suggested that 22 percent of unmarried women aged 30 to

⁷¹Note that these rules imply that unrelated children under age 15 (such as foster children) are not included in the universe of people for whom poverty status is calculated.

39 were cohabiting. This compares with 9 percent estimated from the CPS direct questions.⁷²

In view of the relationship of many of these couples, the panel recommended that cohabiting couples be treated as families. Therefore, to reflect the pooling of income and sharing of expenditures of these couples and their families, estimates presented in section three of this report include within a single unit of analysis the householder and unmarried partner of the householder, as well as all the relatives of the householder and any children of the unmarried partner who are present in the household. The official measure excludes children of an unmarried partner from the unrelated subfamily of the unmarried partner if these children have ever been married or if they are age 18 or over, classifying them instead as unrelated individuals, that is, as separate units of analysis for assessing poverty. The more inclusive cohabiting-couple unit of analysis implemented here includes all children of an unmarried partner within the income pooling unit of the unmarried partner and the householder, regardless of the marital status or age of these children. Children who are the biological children of both the householder and the unmarried partner are included in the official poverty unit of analysis of only one of these parents, but the cohabiting unit of analysis links these children with both of their biological parents.

Housemates, roommates, foster children, and other nonrelatives. The units of analysis currently used in the official poverty measure also do not combine the incomes of various additional categories of nonrelatives in the household with the incomes of the householder and relatives of the householder. A housemate or roommate is defined by the Census Bureau as a person who is not related to the householder, but who shares living quarters primarily in order to share expenses.

In addition, even if they have a parent in the household, but have ever been married or are age 18 or over, housemates and roommates are excluded by the official poverty measure from the unrelated subfamily that includes their parents; instead they are classified as unrelated individuals with their poverty status based on their own income only. Housemates and roommates who are children under age 15 are not included in any official poverty unit and their poverty status is neither calculated nor reported if they do not have a parent in the household, despite the fact that they are sharing in the housing and other resources available in the household. Children who are not related to the householder but who live with both biological parents are included in the unit of analysis of no more than one of these parents if the parents are not currently married to each other.

Foster children are placed by the local welfare department in homes of persons (foster parents) who provide care to the children in return for money paid by a state or

⁷²See Bumpass and Lu, 1998, and Casper et al., 1999.

local welfare office. Foster children share in the housing and meals of the household, and no doubt other important aspects of the level of living afforded by the family income available to foster parents. Yet, if they are under age 15, foster children are excluded from all official units of analysis and their poverty status is neither calculated nor reported, while, if they are age 15 or older, they are each treated as an independent unit of analysis based on only their own personal income. Other nonrelatives of the householder who are not members of unrelated subfamilies are treated in a fashion similar to foster children. These persons include friends and guests who are living in the home and sharing in the accommodations and perhaps other aspects of the household level of living, yet they are excluded from the official poverty universe if they are under age 15, and they are treated as an independent unrelated individual with access to only their own income if they are age 15 or older.

Roomers and boarders. Roomers and boarders pay money to the householder in return for lodging or meals. Hence, the rent they pay offsets at least a portion of the costs of maintaining the housing unit (permitting economies of scale in housing for both the householder and the roomer), and they may pay for food which may permit the householder (and boarder) to benefit from economies of scale in purchasing these commodities. In other words, roomers and boarders are sharing their income with the householder, through a formal economic transaction, in order to contribute to payments for housing and, at least sometimes, to food costs that maintain the household.

Despite their financial contribution to maintaining the household, roomers and boarders who are members of unrelated subfamilies are treated by the official poverty measure as a unit of analysis separate from other household members, and among roomers and boarders who are not members of unrelated subfamilies (including those who have a parent in the home but have ever been married or are age 18 or over), poverty status is based only on their own income if they are age 15 or older, or if they are under age 15 they are excluded from the official poverty universe and their poverty status is neither calculated nor reported.

Defining Four Alternative Units of Analysis

In accordance with recommendations of the panel, new poverty estimates are derived here based on four alternative units of analysis that are defined more inclusively than those in the official poverty measure.

1. First, the cohabiting-couple unit of analysis is defined for households with an unmarried partner as including (1) the householder, (2) all the relatives of the householder, (3) the unmarried partner, and (4) regardless of their marital status or age, the children of the unmarried partner. One purpose of including all persons

identified as children of the unmarried partner is to insure the identical treatment of persons identified as children of the householder and those identified as children of the unmarried partner. Because the Census Bureau explicitly identifies no more than one parent for each person in a household, an unknown but potentially sizeable number of persons identified as children of the householder are also biological children of the unmarried partner, and an unknown but potentially sizeable number of persons identified as children of the unmarried partner are also biological children of the householder. In other words, in an unknown but potentially large number of households, the householder and the unmarried partner are actually the biological parents of the children identified by the Census Bureau as the child of only one of them. All persons in the household who are not included in this “cohabiting couple” unit of analysis are instead classified according to the procedures of the official measure.

2. Second, the housemate-roommate unit of analysis is defined for households with one or more housemates, roommates, or other nonrelatives of the householder who were not included in the unmarried-partner unit of analysis. For these households the unit of analysis includes (1) the householder, (2) all the relatives of the householder, (3) the housemates, roommates, foster children, or other nonrelatives of the householder who were not included in the unmarried-partner unit of analysis, and (4) regardless of their marital status or age, the children of the housemates, roommates, or other nonrelatives of the householder who were not included in the unmarried-partner unit of analysis. All persons in the household who are not included in this unit of analysis, that is, those included in the unmarried-partner unit of analysis, or roomers and boarders, are instead classified according to the procedures of the official measure. In results that combine the unmarried-partner and housemate-roommate units of analysis, all the nonrelatives included in both units of analysis with the householder and householder’s relatives are treated as a single unit of analysis.
3. Third, the roomer-boarder unit of analysis is defined for households with one or more roomers or boarders who were not included in the unmarried-partner or housemate-roommate units of analysis. For these households, the unit of analysis includes (1) the householder, (2) all the relatives of the householder, and (3) roomers and boarders of the householder who were not included in the unmarried-partner or housemate-roommate units of analysis. All persons in the household who are not included in this unit of analysis, that is, those included in the unmarried-partner and housemate-roommate units of analysis, are

instead classified according to the procedures of the official measure.

4. Fourth, the household unit of analysis is defined as including all persons in the household.

Appendix D.

Summary of NAS Panel Recommendations

This appendix summarizes pages 4 through 15 of *Measuring Poverty: A New Approach*, Constance F. Citro and Robert T. Michael, editors, National Academy Press, 1995.

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, nonwork-related transportation).
- A threshold for a reference family type should be developed using actual Consumer Expenditure Survey data and updated annually to reflect changes in expenditures 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 premiums.

Recommendation 2.1. A poverty threshold with which to initiate a new series of official U.S. poverty statistics should be derived from Consumer Expenditure Survey data for a reference family of four persons (two adults and

two children). The procedure should be to specify a percentage of median annual expenditures for such families on the sum of three basic goods and services (food, clothing, and shelter, including utilities) and apply a specified multiplier to the corresponding dollar level so as to add a small amount for other needs.

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

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

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

Recommendation 3.1. The four-person (two-adult/two-child) poverty threshold should be adjusted for other family types by means of an equivalence scale that reflects differences in consumption by adults and children under 18 and economies of scale for larger families. A scale that meets these criteria is the following: children under 18 are treated as consuming 70 percent as much as adults on average; economies of scale are computed by taking the number of adult equivalents in a family (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 housing across geographic areas of the country. Available data from the decennial census permit the development of a reasonable cost-of-housing index for nine regions and, within each region, for several population size categories of metropolitan areas. The index should be applied to the housing portion of the poverty thresholds.

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

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

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

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

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

- Deduct child support payments from the income of the payer.

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

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

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

Recommendation 5.3. The Census Bureau should routinely issue public-use files from both SIPP and the March CPS that include the Bureau’s best estimate of disposable income and its components (taxes, in-kind benefits, child care expenses, 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 estimates from the limited information in the decennial census that are comparable with the estimates that would be obtained under a fully implemented disposable income concept. In addition, serious consideration should be given to adding one or two questions to the decennial census to assist in the development of comparable estimates.

Recommendation 5.6. The Bureau of Labor Statistics should undertake a comprehensive review of the Consumer Expenditure Survey to assess the costs and benefits of changes to the survey design, questionnaire, sample size, and other features that could improve the quality and usefulness of the data. The review should consider ways to improve the 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 an annual basis. Appropriate agencies should develop poverty measures for periods that are shorter and longer than a year, with data from SIPP and the Panel Study of Income Dynamics, for such purposes as program evaluation. Such measures may require the inclusion of asset values in the family resources definition.

Recommendation 6.2. The official measure of poverty should continue to use families and unrelated individuals as the units of analysis for which thresholds are defined and 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.

Elements of the Current and Proposed Poverty Measures¹

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	Adjust 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

¹Table copied from Table 1-1, page 41: Constance F. Citro and Robert T. Michael (eds.), *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

Appendix E.

Source and Accuracy of Estimates

SOURCES OF DATA

Most estimates in this report come from data obtained in March of the years 1991 through 1998 in the Current Population Survey (CPS). The Census Bureau conducts the survey every month, although this report uses only March data for its estimates. The March survey uses two sets of questions: the basic CPS and the supplement.

The Census Bureau used data from various sources in developing alternative measures of income and poverty for 1997. Specifically, we combined data from the American Housing Survey (AHS), the Consumer Expenditure Survey (CEX), the Survey of Income and Program Participation (SIPP), the National Medical Expenditure Survey (NMES), the Income Survey Development Program (ISDP), and the Internal Revenue Service (IRS) with CPS data.

In addition, this report uses the *State Tax Handbook* from the Commerce Clearing House as another information source of tax data. For some noncash valuation estimates, this report uses data from the U.S. Department of Agriculture (USDA), the Health Care Financing Administration (HCFA), and the Department of Housing and Urban Development (HUD).

A description of the sources of data we used to derive these estimates follows. Except for the CPS, these descriptions are brief. See Current Population Reports, Series P60-186RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1992*, and publications on the appropriate surveys for more details.

American Housing Survey. The Census Bureau collects housing data for the Department of Housing and Urban Development. The population covered by the sample for the AHS (called the Annual Housing Survey before 1984) includes all housing units in the United States. For a more detailed description of the sample design, see the report Current Housing Reports, Series H150-89, *The American Housing Survey for the United States in 1989*, U.S. Department of Commerce.

The AHS is no longer conducted in even numbered years, so we based the property tax estimates in this report on the 1993 AHS. Also, for the noncash estimates, we used the 1985 AHS data in a model to estimate the value of public housing. For more details on the AHS model used to estimate public and subsidized housing values, please see Appendix B of Current Population Reports, Series P60-186RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1992*.

Consumer Expenditure Survey. There are two components to the Consumer Expenditure Survey: the Quarterly Interview Survey and the Diary Survey.

The Quarterly Interview Survey obtains data on large expenditures and those which occur on a fairly regular basis; that is, the type of expenditures that we expect respondents to recall accurately over a 3-month period and for which records are likely to be available. The Diary Survey provides data on items not covered in detail in the Quarterly Survey by asking respondents to keep two 1-week diaries to record all purchases made during the period.

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 U.S. Census Bureau. The design in effect until 1994 introduced a new sample panel each February. In 1994 and 1995, there were no panels introduced. In 1996, a nonoverlapping design was implemented. Each sample household is interviewed every 4 months. The sample covers the U.S. civilian noninstitutionalized population and members of the Armed Forces living off post or with their families on post. Sample size has varied from 12,500 to 23,500 households per panel; the 1996 panel is composed of 36,700 households. The reporting unit is the household, with unrelated individuals and families also identified.

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

Income Survey Development Program. The ISDP was the research and development phase for the Survey of Income and Program Participation (SIPP). The Census Bureau used the ISDP to examine and resolve design, operational, and technical issues for the SIPP. The household sample for the 1979 ISDP was a nationwide multiple

frame sample. The majority of sample households in the ISDP came from addresses contacted in the 1976 Survey of Income and Education.

Statisticians selected the remainder of sample households from a reserve file of sample cases maintained by the Census Bureau. For a more detailed description of this sample design, see the report *Wage and Salary Data From the Income Survey Development Program: 1979 (Preliminary Data From Interview Period One)*, Current Population Reports, Special Studies, Series P-23, No. 118.

Internal Revenue Service data. Much of the IRS data in this report come from the Statistics of Income (SOI) series, in particular the SOI Bulletin *Individual Income Tax Returns, Preliminary Data: 1996*, Spring 1998. This report, based on a sample drawn from all tax returns filed in 1997, presents information on taxpayers' incomes, exemptions, deductions, credits, and taxes.

Data from other sources. The State Tax Handbook, October 1, 1991, from the Commerce Clearing House, includes information on state tax systems. We updated these data to reflect changes in state income tax rates.

Much of the data on cash and noncash benefits are from administrative records. Values of school lunches and food stamps are from USDA unpublished data. Medicaid and medicare data come from HCFA unpublished records. Also, USDA and HUD data are used to compute medicaid and medicare values. For more details, see Appendix B of Current Population Reports, Series P60-186RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1992*.

Basic CPS. The basic CPS collects primarily labor force data about the civilian noninstitutional population. Field representatives ask questions concerning labor force participation of each member 15 years old and over in every sample household.

The CPS sample includes coverage in all 50 states and the District of Columbia. The Census Bureau continually updates the sample to account for new residential construction. The Census Bureau divides the United States into 2,007 geographic areas. In most states, a geographic area consists of a county or several contiguous counties. In some areas of New England and Hawaii, the Census Bureau uses minor civil divisions instead of counties. We select a total of 754 geographic areas for the sample. About 50,000 occupied households are eligible for interview every month. Field representatives are unable to obtain interviews at about 3,200 of these units. This occurs when the occupants are not found at home after repeated calls or are unavailable for some other reason.

Since the introduction of the CPS, the Census Bureau has redesigned the CPS sample several times. These redesigns have improved the quality and accuracy of the data and have satisfied changing data needs. The Census Bureau completely implemented the most recent changes in July 1995.

Table E-1. Description of the March Current Population Survey

Time period	Number of sample areas	Housing units eligible ¹	
		Interviewed	Not interviewed
1996 to 1998	754	46,800	3,200
1995	792	56,700	3,300
1990 to 1994	729	57,400	2,600
1989	729	53,600	2,500
1988	729	53,200	2,600
1986 to 1987	729	57,000	2,500
1985	² 629/729	57,000	2,500
1982 to 1984	629	59,000	2,500
1980 to 1981	629	65,500	3,000
1977 to 1979	614	55,000	3,000
1973 to 1976	461	46,500	2,500
1972	449	45,000	2,000
1967 to 1971	449	48,000	2,000
1963 to 1966	357	33,500	1,500
1960 to 1962	333	33,500	1,500

¹Excludes about 2,500 Hispanic households added from the previous November sample. (See "CPS March Supplement.")

²The Census Bureau redesigned the CPS following the 1980 Decennial Census of Population and Housing. During the phase-in of the new design, housing units from the new and old designs were in sample.

Table E-1 summarizes changes in the CPS designs for the years 1960 to 1998.

CPS March supplement. In addition to the basic CPS questions, field representatives ask supplementary questions in March about money income received the previous calendar year.

To obtain more reliable data for the Hispanic population, the Census Bureau increased the March CPS sample by about 2,500 eligible housing units, interviewed the previous November, that contained at least one sample person of Hispanic origin.¹ In addition, the sample includes people in the Armed Forces living off post or with their families on post.

CPS estimation procedure. This survey's estimation procedure inflates weighted sample results to independent estimates of the civilian noninstitutional population of the United States by age, gender, race, Hispanic/non-Hispanic origin, and state of residence. The independent estimates are based on:

- The 1990 Decennial Census of Population and Housing.
- An adjustment for undercoverage in the 1990 census.
- Statistics on births, deaths, immigration, and emigration.
- Statistics on the size of the Armed Forces.

¹This report shows information on the Hispanic population collected in the 50 states and the District of Columbia, and therefore does not include residents of Puerto Rico.

The independent population estimates used for 1994 and later are based on updates to controls established by the 1990 decennial census. Data previous to 1994 are based on independent population estimates from the latest available decennial census data. For more details on the change in independent estimates, see the section entitled "Introduction of 1990 Census Population Controls" in an earlier report (Series P-60, No. 188). The estimation procedure for the March supplement included a further adjustment so that the husband and wife of a household received the same weight.

ACCURACY OF THE ESTIMATES

Since the CPS estimates come from a sample, they may differ from figures from a complete census using the same questionnaires, instructions, and enumerators. A sample survey estimate has two possible types of error: sampling and nonsampling. The accuracy of an estimate depends on both types of error, but the full extent of the nonsampling error is unknown. Consequently, one should be particularly careful when interpreting results based on a relatively small number of cases or on small differences between estimates. The standard errors for CPS estimates primarily indicate the magnitude of sampling error. They also partially measure the effect of some nonsampling errors in responses and enumeration, but do not measure systematic biases in the data. Bias is the average, over all possible samples, of the differences between the sample estimates and the true value.

Nonsampling variability. We can attribute nonsampling errors to several sources including the following:

- Inability to obtain information about all cases in the sample.
- Definitional difficulties.
- Differences in the interpretation of questions.

- Respondents' inability or unwillingness to provide correct information.
- Respondents' inability to recall information.
- Errors made in data collection, such as recording and coding the data.
- Errors made in processing the data.
- Errors made in estimating values for missing data.
- Failure to represent all units with the sample (undercoverage).

CPS undercoverage results from missed housing units and missed people within sample households. Compared with the level of the 1990 decennial census, overall CPS undercoverage is about 8 percent. Undercoverage varies with age, gender, and race. Generally, undercoverage is larger for males than for females and larger for Blacks and other races combined than for Whites. As described previously, ratio estimation to independent age-gender-race-Hispanic population controls partially corrects for bias due to undercoverage. However, biases exist in the estimates to the extent that missed people in missed households or missed people in interviewed households have different characteristics from those of interviewed people in the same age-gender-race-Hispanic origin group.

A common measure of survey coverage is the coverage ratio, the estimated population before post-stratification divided by the independent population control. Table E-2 shows CPS coverage ratios for age-gender-race groups for a typical month. The CPS coverage ratios can exhibit some variability from month to month, but these are a typical set of coverage ratios.

Answers to questions about money income often depend on the memory of one person in the household. Recall problems can cause underestimates of income in survey data because it is easy to forget minor or irregular sources of income. Respondents may also misunderstand

Table E-2. March CPS Coverage Ratios

Age	Non-Black		Black		All persons		
	Male	Female	Male	Female	Male	Female	Total
0 to 14 years	0.942	0.951	0.880	0.904	0.932	0.943	0.937
15 to 19 years	0.864	0.910	0.885	0.751	0.867	0.884	0.876
20 to 24 years	0.823	0.877	0.707	0.757	0.808	0.859	0.834
25 to 29 years	0.863	0.919	0.755	0.810	0.850	0.903	0.877
30 to 34 years	0.880	0.950	0.671	0.833	0.855	0.934	0.895
35 to 44 years	0.899	0.940	0.684	0.863	0.875	0.930	0.903
45 to 54 years	0.938	0.961	0.778	0.953	0.923	0.960	0.942
55 to 64 years	0.932	0.953	0.834	0.929	0.923	0.951	0.938
65 to 74 years	0.932	0.977	0.939	0.958	0.932	0.975	0.956
75 years and older	1.019	1.008	0.910	0.961	1.011	1.004	1.007
15 years and older	0.902	0.945	0.767	0.858	0.887	0.934	0.912
0 years and older	0.911	0.946	0.802	0.871	0.898	0.936	0.917

what the Census Bureau considers money income or may simply be unwilling to answer these questions correctly because the questions are considered too personal. See Appendix C, Current Population Reports, Series P60-184, *Money Income of Households, Families, and Persons in the United States: 1992* for more details.

For additional information on nonsampling error, see Appendix F of this report. Also, see Statistical Policy Working Paper 3, *An Error Profile: Employment as Measured by the Current Population Survey*, Office of Federal Statistical Policy and Standards, U.S. Department of Commerce, 1978 and Technical Paper 40, *The Current Population Survey: Design and Methodology*, Bureau of the Census, U.S. Department of Commerce.

Comparability of data. Data obtained from the CPS and other sources are not entirely comparable. This results from differences in interviewer training and experience and in differing survey processes. This is an example of nonsampling variability not reflected in the standard errors. Use caution when comparing results from different sources.

A number of changes were made in data collection and estimation procedures beginning with the January 1994 CPS. The major change was the use of a new questionnaire. The Bureau of Labor Statistics redesigned the questionnaire to measure the official laborforce concepts more precisely, to expand the amount of data available, to implement several definitional changes, and to adapt to a computer-assisted interviewing environment. The Census Bureau modified the March supplemental income questions for adaptation to computer-assisted interviewing, but did not change definitions and concepts. Because of these and other changes, one should use caution when comparing estimates from data collected in 1994 and later years with estimates from earlier years.

Data users should also use caution when comparing estimates in this report (which reflect 1990 census-based population controls) with estimates from the March 1993 CPS and earlier years (which reflect 1980 census-based population controls). This change in population controls had relatively little impact on summary measures, such as means, medians, and percent distributions. It did have a significant impact on levels. For example, 1990-based population controls caused a 1-percent increase in the civilian noninstitutional population and in the number of families and households. Thus, estimates of levels for data collected in 1994 and later years will differ from those for earlier years by more than what could be attributed to actual changes in the population. These differences could be disproportionately greater for certain subpopulation groups than for the total population.

Since the Census Bureau did not use independent population control totals for people of Hispanic origin before 1983, compare Hispanic estimates over time cautiously.

Based on the results of each decennial census, the Census Bureau gradually introduces a new sample design for

the CPS. During this phase-in period, the Census Bureau collects CPS data from sample designs based on different censuses. While most CPS estimates have been unaffected by this mixed sample, geographic estimates are subject to greater error and variability. Users should exercise caution when comparing estimates across years for metropolitan/nonmetropolitan categories. For more information, see Appendix C, Current Population Reports, Series P60-193, *Money Income in the United States: 1995 (With Separate Data on Valuation of Noncash Benefits)*.

Note when using small estimates. The Census Bureau shows summary measures (such as medians and percentage distributions) only when the base is 75,000 or greater. Because of the large standard errors involved, summary measures would probably not reveal useful information when computed on a smaller base. However, we display estimated numbers even though the relative standard errors of these numbers are larger than those for corresponding percentages. These smaller estimates permit combinations of the categories to suit data users' needs. Take care in the interpretation of small differences. For instance, even a small amount of nonsampling error can cause a borderline difference to appear significant or not, thus distorting a seemingly valid hypothesis test.

Sampling variability. Sampling variability is variation that occurred by chance because a sample was surveyed rather than the entire population. Standard errors, as calculated by methods described below in Standard errors and their use, are primarily measures of sampling variability, but they may include some nonsampling error.

Standard errors and their use. Data users must use a number of approximations to derive, at a moderate cost, standard errors applicable to the estimates in this report. Instead of providing an individual standard error for each estimate, we have provided two parameters, a and b, to calculate standard errors for each type of characteristic.

Table E-3 provides standard error parameters for various types of characteristics. Table E-4 provides factors to approximate CPS standard errors for estimates prior to 1997. Table E-5 has the year-to-year correlation coefficients for income characteristics.

The sample estimate and its standard error enable one to construct a confidence interval, a range that would include the average result of all possible samples with a known probability. For example, if all possible samples were surveyed under essentially the same general conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then approximately 90 percent of the intervals from 1.645 standard errors below the estimate to 1.645 standard errors above the estimate would include the average result of all possible samples.

A particular confidence interval may or may not contain the average estimate derived from all possible samples.

Table E-3. CPS Standard Error Parameters for Poverty, Income, and Nonincome Characteristics: 1997

Characteristics	Total or White		Black		Hispanic	
	a	b	a	b	a	b
BELOW POVERTY LEVEL						
Persons						
Total	-0.000039	10,380	-0.000301	10,380	-0.000338	10,380
Male	-0.000079	10,380	-0.000647	10,380	-0.000641	10,380
Female	-0.000076	10,380	-0.000563	10,380	-0.000666	10,380
Age						
Under 15	-0.000134	8,002	-0.000834	8,002	-0.000857	8,002
Under 18	-0.000112	8,002	-0.000698	8,002	-0.000664	8,002
15 and over	-0.000050	10,380	-0.000417	10,380	-0.000486	10,380
15 to 24	-0.000106	3,927	-0.000703	3,927	-0.000487	3,927
25 to 44	-0.000047	3,927	-0.000366	3,927	-0.000276	3,927
45 to 64	-0.000070	3,927	-0.000666	3,927	-0.000295	3,927
65 and over	-0.000122	3,927	-0.001403	3,927	-0.000885	3,927
Households, Families, and Unrelated Individuals						
Total	+0.000102	2,442	+0.000102	2,442	+0.000102	2,442
ALL INCOME LEVELS						
Persons						
Total	-0.000012	2,454	-0.000116	2,810	-0.000135	2,810
Male	-0.000025	2,454	-0.000258	2,810	-0.000264	2,810
Female	-0.000023	2,454	-0.000210	2,810	-0.000275	2,810
Age						
15 to 24	-0.000066	2,454	-0.000503	2,810	-0.000349	2,810
25 to 44	-0.000030	2,454	-0.000262	2,810	-0.000197	2,810
45 to 64	-0.000044	2,454	-0.000477	2,810	-0.000211	2,810
65 and over	-0.000076	2,454	-0.001047	2,810	-0.000633	2,810
Households, Families, and Unrelated Individuals						
Total	-0.000013	2,241	-0.000119	2,247	-0.000210	2,247
Households with children under 18	-0.000013	2,241	-0.000119	2,247	-0.000210	2,247
NONINCOME CHARACTERISTICS						
Persons						
Employment status	-0.000018	2,985	-0.000125	3,139	-0.000151	3,139
Educational attainment	-0.000012	2,757	-0.000139	2,680	-0.000163	3,051
Health insurance	-0.000024	6,332	-0.000320	11,039	-0.000359	11,039
Total, Marital Status, Other						
Some household members	-0.000019	5,211	-0.000217	7,486	-0.000244	7,486
All household members	-0.000024	6,332	-0.000320	11,039	-0.000359	11,039
Households, Families, and Unrelated Individuals						
Total	-0.000012	2,068	-0.000077	1,871	-0.000155	1,871

Note: To determine parameters prior to 1997, multiply by the appropriate factor in Table E-4. For nonmetropolitan residence categories, multiply the a and b parameters by 1.5. For foreign-born characteristics, multiply the a and b parameters for Total and White by 1.3. No adjustment is necessary for Blacks and Hispanics.

However, one can say with specified confidence that the interval includes the average estimate calculated from all possible samples.

Some statements in the report may contain estimates followed by a number in parentheses. This number can be

added to and subtracted from the estimate to calculate upper and lower bounds of the 90-percent confidence interval. For example, if a statement contains the phrase

Table E-4. **CPS Factors to Apply to a and b Parameters for Estimates Prior to 1997**

Characteristics	Factor
NON-HISPANIC	
1996	1.00
1989 to 1995	0.92
1988	1.02
1981 to 1987	0.86
1967 to 1980	0.75
HISPANIC	
1996	1.00
1989 to 1995	0.92
1988	1.19
1984 to 1987	0.86

“grew by 1.7 (±1.0) percent,” the 90-percent confidence interval for the estimate, 1.7 percent, is 0.7 percent to 2.7 percent.

Data users may also use standard errors to perform hypothesis testing. This is a procedure for distinguishing between population parameters using sample estimates. One common type of hypothesis appearing in this report is that two population parameters are different.

One can perform tests at various levels of significance. The significance level of a test is the probability of concluding that the characteristics are different when, in fact, they are the same. All statements of comparison in the text were tested at the 0.10 level of significance or better. This means that the absolute value of the estimated difference between characteristics is greater than or equal to 1.645 times the standard error of the difference.

The Census Bureau uses 90-percent confidence intervals and 0.10 levels of significance to determine statistical validity. Consult standard statistical textbooks for alternative criteria.

Standard errors of estimated numbers. One can obtain the approximate standard error, s_x , of an estimated number shown in this report by using the formula:

$$s_x = \sqrt{ax^2 + bx} \quad (1)$$

Here x is the size of the estimate and a and b are the parameters in Table E-3 associated with the particular type of characteristic. When calculating standard errors from cross-tabulations involving different characteristics, use the set of parameters for the characteristic which will give the largest standard error.

Illustration. Suppose that there were 35,574,000 people below the poverty level in 1997. Use the appropriate parameters from Table E-3 and formula (1) to get

Number, x	35,574,000
a parameter	-0.000039
b parameter	10,380
Standard error	566,000
90% conf. int.	34,644,000 to 36,504,000

The standard error is calculated as

$$s_x = \sqrt{-0.000039 \times 35,574,000^2 + 10,380 \times 35,574,000} = 566,000$$

The 90-percent confidence interval is calculated as 35,574,000 ± 1.645 × 566,000.

A conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 90 percent of all possible samples.

Standard errors of estimated percentages. The reliability of an estimated percentage, computed using

Table E-5. **CPS Year-to-Year Correlation Coefficients for Poverty and Income Estimates**

Characteristics	Below poverty level								All income levels	
	1972-1983 or 1984-1997		1983 - 1984		1971 - 1972		1970 - 1971		1960 - 1997	
	People	Families	People	Families	People	Families	People	Families	People	Families, households, and unrelated individuals
Total	0.45	0.35	0.39	0.30	0.15	0.14	0.31	0.28	0.30	0.35
White	0.35	0.30	0.30	0.26	0.14	0.13	0.28	0.25	0.30	0.35
Black	0.45	0.35	0.39	0.30	0.17	0.16	0.35	0.32	0.30	0.35
Other races	0.45	0.35	0.30	0.30	0.17	0.16	0.35	0.32	0.30	0.35
Hispanic ¹	0.65	0.55	0.56	0.47	0.17	0.16	0.35	0.32	0.45	0.55

¹People of Hispanic origin may be of any race.

Note: These correlations are for comparisons of consecutive years. For comparisons of nonconsecutive years, assume the correlations are zero. For Asians and Pacific Islanders, use the correlation coefficient for total. Correlation coefficients for 1983-84 are lower than those for 1982-83 or 1984-85 because of the phase-in of the new sample design.

sample data from both numerator and denominator, depends on both the size of the percentage and its base. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more. When the numerator and denominator of the percentage are in different categories, use the parameter from Table E-3 indicated by the numerator. One can obtain the approximate standard error, $s_{x,p}$, of an estimated percentage by using the formula

$$s_{x,p} = \sqrt{\frac{b}{x} p(100 - p)} \quad (2)$$

Here x is the total number of people, families, households, or unrelated individuals in the base of the percentage, p is the percentage ($0 \leq p \leq 100$), and b is the parameter in Table E-3 associated with the characteristic in the numerator of the percentage.

Illustration. Suppose that of the 35,574,000 people below the poverty level in 1997, 24,396,000, or 68.6 percent, were White. Use the appropriate parameter from Table E-3 and formula (2) to get

Percentage, p	68.6
Base, x	35,574,000
b parameter	10,380
Standard error	0.8
90% conf. int.	67.3 to 69.9

The standard error is calculated as

$$s_{s,p} = \sqrt{\frac{10,380}{35,574,000} \times 68.6 \times (100 - 68.6)} = 0.8$$

The 90-percent confidence interval is calculated as $68.6 \pm 1.645 \times 0.8$.

Standard error of a difference. The standard error of the difference between two sample estimates is approximately equal to

$$s_{x-y} = \sqrt{s_x^2 + s_y^2 - 2rs_x s_y} \quad (3)$$

where s_x and s_y are the standard errors of the estimates, x and y . The estimates can be numbers, percentages, ratios, etc. Table E-5 contains the correlation coefficient, r , for year-to-year comparisons for CPS income estimates of numbers and proportions. For other comparisons, assume that r equals zero. Making this assumption will result in accurate estimates of standard errors for the difference between two estimates of the same characteristic in two different areas, or for the difference between separate and uncorrelated characteristics in the same area. However, if there is a high positive (or negative) correlation between the two characteristics, the formula will overestimate (or underestimate) the true standard error.

Illustration. Suppose that the number of people below the poverty level in 1997 was 35,574,000 and in 1996 was 36,529,000. The apparent difference is -955,000. Use the appropriate parameters and factors from Table E-3 and Table D-4 and formulas (1) and (3) to get

	x	y	difference
Estimate, x	35,574,000	36,529,000	-955,000
a parameter	-0.000039	-0.000039	-
b parameter	10,380	10,380	-
r	-	-	0.45
Standard error	566,000	572,000	597,000
90% conf. int.	34,644,000 to 36,504,000	35,588,000 to 37,470,000	-1,937,000 to 27,000

The standard error of the difference is calculated as

$$s_{x-y} = \sqrt{566,000^2 + 572,000^2 - 2 \times 0.45 \times 566,000 \times 571,000} = 597,000$$

The 90-percent confidence interval for the estimated difference between the number of people in poverty for 1997 and 1996 is calculated as $-955,000 \pm 1.645 \times 597,000$. Because this interval contains zero, we cannot conclude with 90-percent confidence that the number of people below the poverty level in 1997 was lower than the number of people below the poverty level in 1996.

Standard error of a ratio. Certain estimates may be calculated as the ratio of two numbers. The standard error of a ratio, x/y , may be computed using

$$s_{x/y} = \frac{x}{y} \sqrt{\left(\frac{s_x}{x}\right)^2 + \left(\frac{s_y}{y}\right)^2 - 2r \frac{s_x s_y}{xy}} \quad (4)$$

The standard error of the numerator, s_x , and that of the denominator, s_y , may be calculated using formulas described earlier. In formula (4), r represents the correlation between the numerator and the denominator of the estimate.

For one type of ratio, the denominator is a count of families or households and the numerator is a count of people in those families or households with a certain characteristic. If there is at least one person with the characteristic in every family or household, use 0.7 as an estimate of r . An example of this type is the mean number of children per family with children.

For all other types of ratios, r is assumed to be zero. If r is actually positive (or negative), then this procedure will provide an overestimate (or underestimate) of the standard error of the ratio. Examples of this type are the mean number of children per family and the family poverty rate.

Note: For estimates expressed as the ratio of x per 100 y or x per 1,000 y , multiply formula (4) by 100 or 1,000, respectively, to obtain the standard error.

Illustration. Suppose the number of families below the poverty level, x , was 7,324,000 and the total number of families, y , was 70,884,000. The ratio of families below

the poverty level to the total number of families would be 0.103 or 10.3 percent. Use the appropriate parameters from Table E-3 and formulas (1) and (4) with $r=0$ to get

	x	y	ratio
Estimate	7,324,000	70,884,000	0.103
a parameter	+0.000102	-0.000012	
b parameter	2,442	2,068	-
Standard error	153,000	294,000	0.002
90% conf. int.	7,073,000 to 7,575,000	70,401,000 to 71,367,000	0.099 to 0.107

Using formula (8) with $r = 0$, the estimate of the standard error is

$$s_{x/y} = \frac{7,324,000}{70,884,000} \sqrt{\left[\frac{153,000}{7,324,000}\right]^2 + \left[\frac{294,000}{70,884,000}\right]^2} = 0.002$$

The 90-percent confidence interval is calculated as 0.103 \pm 1.645 x 0.002.

Appendix F.

Data Quality: Current Population Survey

The quality of income data derived from surveys is affected by two main sources of error: sampling error and nonsampling error. Sampling error is fairly easily quantified and is discussed in Appendix E. Nonsampling error, which is addressed in this section, can have many sources, such as:

1. Failure of the sample frame to include all units for which the survey was intended to represent.
2. Failure to contact all sample units.
3. Poor quality of responses.
4. Missing data problems.

Most of the analysis of nonsampling error is made at the aggregate level since the kind of data needed to make those types of analysis are more readily available.

Over the years, evaluations of the quality of the March CPS income estimates have revealed downward biases when survey estimates are compared to independent estimates derived from administrative sources. Deriving independent estimates for the purpose of evaluating the quality of survey data can be difficult and results in some uncertainties. The survey and administrative sources use different definitions, cover different universes, and are based on different concepts. Therefore, adjustments to the administrative sources must be attempted. These adjustments attempt to remove income that is received by the institutional population, deceased people, and people not living the United States. Also, the adjustments should remove any components of income that are received as in-kind payments or benefits and remove lump-sum or one-time payments or withdrawals.

In spite of the uncertainties regarding the development of independent estimates, it is important to attempt to monitor the quality of survey data using these sources. An evaluation of March 1997 CPS income data follows.

Table F1 presents income aggregates for 17 different income sources. Five of those sources are well reported in the March CPS with their aggregate incomes exceeding 90 percent of benchmark estimates: wages and salary, social security, supplemental security income, veterans' payments, and private pensions. The reporting of these income sources has remained about the same or improved

over time (see Table F2). The reporting for three other income sources has shown a steady trend of improved reporting though they are not at the same high levels relative to benchmarks. Property income, both interest and dividends, improved from the low to mid 50 percent levels in 1984 to over 70 percent in 1996. Unemployment compensation showed a moderate improvement with aggregate income, relative to benchmarks, going from 75 percent to 83 percent. In total, these eight sources of income with improved reporting accounted for roughly 90 percent of all the income collected in the CPS in 1996.

The reporting for the remaining income sources has not fared so well. CPS aggregate income estimates have declined, relative to benchmarks, steadily over time for the remaining income sources with the exception of workers' compensation. The reporting of workers' compensation is up from its 1984 levels, though down slightly from 1990. Some of the declines for the other income sources are relatively minor as in the case of Federal employee pensions where the percent went down only a few points (from 85 percent to 81 percent). Others, however, are more severe, such as military retirement (dropping nearly 40 percentage points) and rents and royalties (dropping 35 percentage points). Though it is not encouraging to see a drop in the reporting of any income source, the sources showing a decline in their aggregate income, relative to benchmarks, are minor and accounted for only 7 percent of all CPS income in 1996.¹

This section does not report on nonsampling error for noncash items, such as food stamps, that are used in this report. Nevertheless, it is important to note that many of the elements of the poverty estimates presented in this report suffer from underreporting, as we have shown in Appendix C. Each element is subject to underreporting problems to differing degrees. In contrast, the imputation for medical out-of-pocket expenses is controlled to a benchmark which is not underreported. Corrections for these underreporting problems would result in different estimates of the prevalence of poverty and, therefore, this is an additional subject for research.

¹The remaining 3 percent of aggregate CPS income in 1996 is from sources where we do not have independent benchmarks at this time.

Table F1. **CPS Aggregates as a Percent of Benchmark: 1996**

	Benchmark (preliminary)	Aggregate (millions)	1996
Wages and salary	3,585,238	3,668,060	102.3
Self-employment	471,624	239,367	50.8
Interest	198,784	156,114	78.5
Dividends	108,186	76,658	70.9
Rents and royalties	75,332	44,515	59.1
Social security	323,274	298,819	92.4
Railroad retirement	7,660	3,405	44.5
Supplemental security income	27,270	22,261	81.6
Aid to families with dependent children	21,574	13,368	62.0
Other cash welfare	3,375	2,720	80.6
Unemployment compensation	21,163	17,624	83.3
Worker compensation	16,704	12,954	77.6
Veterans payments	18,318	15,854	86.5
Private pensions	99,421	106,993	107.6
Federal employee pensions	38,715	31,111	80.4
Military retirement	28,201	16,388	58.1
State and local employee pensions	65,835	37,649	57.2
Total (where benchmark exists) ...	5,110,676	4,763,857	93.2

Source: Preliminary Census Bureau tabulations of March 1997 CPS data.

Table F2. **CPS Aggregates as a Percent of Benchmark: 1984-1996**

	1984	1990	1996
Wages and salary	97.3	97.0	102.3
Self-employment	70.2	66.8	50.8
Interest	56.7	61.1	78.5
Dividends	51.8	31.3	70.9
Rents and royalties	95.4	87.8	59.1
Social security	91.9	93.0	92.4
Railroad retirement	71.4	66.7	44.5
Supplemental security income	84.8	89.0	81.6
Aid to families with dependent children	78.4	71.6	62.0
Other cash welfare	120.0	86.2	80.6
Unemployment compensation	74.8	80.2	83.3
Worker compensation	48.2	94.5	77.6
Veterans payments	59.7	77.5	86.5
Private pensions	57.2	110.8	107.6
Federal employee pensions	84.7	82.6	80.4
Military retirement	98.1	89.2	58.1
State and local employee pensions	71.7	80.1	57.2
Total (where benchmark exists) ...	88.3	89.0	93.2

Source: Data for 1984 from Vaughan (1989), for 1990 from Coder and Scoon-Rogers (1996), and for 1996 from preliminary Census Bureau tabulations of March 1997 CPS data.

