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Bruce D. Meyer, University of Chicago and NBER

James X. Sullivan, University of Notre Dame

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Three Decades of Consumption and Income Poverty*

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Bruce D. Meyer
University of Chicago and NBER

and

James X. Sullivan
University of Notre Dame

Abstract

This paper examines the measurement of poverty in the United States from 1972 through 2004. We investigate how poverty rates and poverty gaps have changed over time, explore how these trends differ across demographic groups, and contrast these trends for several different income and consumption based measures of poverty. We also examine how sensitive different measures of poverty are to assumptions about equivalence scales, price adjustments, and the definition of the resource sharing unit. We document sharp differences, particularly in recent years, between different income based poverty measures, and between income and consumption based poverty rates and gaps. We find that sensible changes from the official price index and resource sharing unit tend to lead to substantial declines in measured income poverty rates, but our equivalence scale changes have only a small impact. We show moving from the official pre-tax money income measure to a disposable income measure that incorporates transfers and fringe benefits has a substantial effect on poverty rate changes over the past two decades. Furthermore, consumption based poverty rates often indicate large declines, even in recent years when income based poverty rates have risen. The patterns are very different across demographic groups, with aggregation hiding generally larger differences between income and consumption poverty rate changes, especially for the elderly. Income and consumption measures of deep poverty and poverty gaps have generally moved sharply in opposite directions in the last two decades with income deep poverty and poverty gaps rising, but consumption based deep poverty and poverty gaps falling. Although there are some practical limitations to an official, consumption based measure of poverty, we argue that consumption poverty is preferred for measuring changes in the well-being of the worst off.

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Meyer: Harris School of Public Policy Studies, University of Chicago, 1155 E. 60th Street, Chicago, IL 60637 bdmeyer@uchicago.edu

Sullivan: University of Notre Dame, Department of Economics and Econometrics, 447 Flanner Hall, Notre Dame, IN 46556 sullivan.197@nd.edu

1. Introduction

The change in the extent of poverty over time is of fundamental interest. The change in poverty is relied upon as an indicator of success or failure of our economic system and government policies. The official poverty rate based on pre-tax money income is by far the most cited measure of the well-being of those with few resources. Although this poverty measure has fluctuated from year to year, it is virtually the same today as it was in 1970. This measure is still relied upon despite its well-known flaws which include a narrow definition of income, an odd adjustment for family size, and a biased adjustment for price changes (Citro and Michael 1995; Besharov and Germanis 2004, Jencks, Mayer and Swingle 2004). While past work has examined some modifications to the official poverty rate, the effect alternative measures have on changes over time is not settled. Some have found that the change in poverty is sharply altered, while others have argued that alternative measures differ in levels but not trends. This paper examines changes over the last three decades in a wide variety of income and consumption measures of poverty in the United States. In addition to the standard poverty rate, we examine deep poverty, near poverty, and poverty gaps. We also explore how the changes differ across demographic groups. This work incorporates several methodological improvements as well as updates past research.

A better understanding of recent changes in poverty is important to both policy makers and researchers. First, the poverty rate is frequently cited by those who are evaluating the need for and consequences of social programs. Together, these programs account for a substantial amount of government spending. In 2002, government expenditures for means-tested state and federal transfer programs exceeded \$522 billion (U.S. Census Bureau 2004, p. 347). A large body of research examines poverty rates and poverty gaps (the difference between family income and the poverty line), or uses these measures to argue in support of or in opposition to specific government policies (Murray 1984; Sawhill 1988; Blank 1997; Burtless and Smeeding 2001; Scholz and Levine 2001; Ziliak 2004; JEC 2004).¹ Over the past few decades, we have seen

¹ A pointed use of poverty statistics comes from former House Ways and Means Committee Chairman Bill Archer's opening comments in the debate on the bill that became the 1996 welfare reform. He stated that "Government has spent \$5.3 trillion on welfare since the war on poverty began, the most expensive war in the history of this country, and the Census Bureau tells us we

dramatic changes in these policies that target poor families including welfare reform and expansions in the Earned Income Tax Credit (EITC). However, there is little consensus on how these reforms have affected poverty. Second, poverty rates are a key determinant of the allocation of federal funds to states and localities for use in education and other programs for the disadvantaged. The poverty line or multiples of the poverty line is also used as an eligibility criteria for dozens of assistance programs (Citro and Michael, 1995). Third, an accurate assessment of the material well-being of the worst off helps to gauge the performance of our economy. The degree of poverty and inequality is cited in discussions of the benefits of growth and the merits of limits on free-markets.

Our study contributes to the existing literature on poverty in several ways. First, we update past research by examining consumption and income based measures through 2004. Examining poverty trends in recent years is particularly interesting given the extensive overhaul during the 1990s in tax and transfer programs that target poor families. Moreover, there is evidence that trends in income and consumption differ noticeably during this period (Meyer and Sullivan, 2006). Second, we construct consumption based measures of poverty that improve upon measures used in previous studies by calculating better measures of housing consumption for those living in public or subsidized housing. Third, we examine the effect on poverty measures of alternative price indices, equivalence scales, and resource sharing units (the family or household) over the past three decades. Fourth, in addition to poverty rates, which focus on the cumulative distribution function at a single point, we also study deep poverty, near poverty and poverty gaps in order to examine more fully the trends in well-being of disadvantaged households. Fifth, we contrast income and consumption poverty rates and gaps for a number of demographic groups including single mothers, children, and the elderly. The fact that this study focuses on improved absolute poverty measures does not imply that relative poverty or inequality measures are uninteresting. Rather, we believe that absolute poverty is an important measuring stick that deserves a featured place among other measures of resource distribution.

In the following section we highlight the extensive literature that evaluates poverty measurement in the U.S., and summarize the findings regarding recent trends for various

have lost the war.” (Congressional Record, 104th Cong., 1st sess., March 21, 1995).

measures of poverty. In Section 3 we describe the data used in our analyses and the methods used to construct an improved measure of consumption. In Section 4 we present our results for changes in a number of different income and consumption based poverty measures over the past three decades. We also examine near poverty, deep poverty and poverty gaps, and present poverty trends for various demographic groups. We offer conclusions in Section 5.

2. Background

2.A. The Official Poverty Measure

Official poverty in the U.S. is determined by comparing the pre-tax money income of the family or unrelated individuals to a predetermined poverty threshold. These data come from an annual supplement to the Current Population Survey.² The original poverty thresholds, developed by Mollie Orshansky of the Social Security Administration in 1964, were based on the USDA's Economy Food Plan budgets. These budgets provide an estimate of the minimum cost for a nutritional diet for families of different sizes. A poverty threshold for a family of three or more was determined as three times the cost of the economy food plan. This multiplier was used because survey data on expenditures suggested that the average family of three or more people allocated about a third of their after-tax income for food. Noting that economies of scale for families of two are smaller, Orshansky used a different multiplier for a family of two (3.7), which again was based on expenditure data. The threshold for individuals was set at 80 percent of the two-person family threshold. In addition to family size, Orshansky's thresholds varied by gender of the family head, number of children under 18, and whether the family lived in a farm residence (Orshansky, 1965). Changes to the official poverty thresholds were made in 1969 and 1981. The current thresholds are adjusted annually using the CPI-U and there are no longer different thresholds for farm and non-farm residents and for male and female-headed families. For a more detailed summary see Citro and Michael (1995).

² The supplement, the Annual Social and Economic (ASEC) Supplement, was formerly called the Annual Demographic File (ADF). A family in the CPS is defined as all individuals related by blood or marriage living in the same unit. See Section 3.A for more details.

2.B. Criticisms of Official Poverty and Alternative Measures

A number of studies have highlighted the shortcomings of the official poverty measure and proposed alternative approaches for measuring absolute poverty.³ These alternative measures differ from official poverty in a number of ways including: different thresholds; different equivalence scales to adjust thresholds by family size; different price indices to adjust thresholds over time; different resource sharing units (i.e. family vs. household); and different resources.⁴

2.B.1 Equivalence Scales

Considerable debate has arisen over the best way to adjust poverty thresholds for different family types. There are a number of concerns regarding the equivalence scale implicit in the official measure. This scale is based on how food needs vary with family size, which may not appropriately reflect differences in costs of living across family types if, for example, economies of scale in non-food consumption are different from economies of scale in food consumption. In addition, the implicit scale does not exhibit diminishing marginal cost over the whole range of family sizes (Ruggles, 1990), and the thresholds imply that children are more costly than adults in some cases. A number of alternative scales have been proposed. The NAS panel recommended an equivalence scale that allows for differences in costs between adults and children and exhibits diminishing marginal cost with each additional adult equivalent.⁵ Scales such as these have been shown to lower the level of poverty slightly (Short et. al., 1999; Citro and Michael, 1995), particularly for unrelated individuals. Others have used expenditure data to construct equivalence scales that are determined by household specific spending on all goods and services, not just food (Slesnick 1993, 2001).

³A National Academy of Sciences (NAS) panel, which was appointed to review the official measure, offers a discussion of the shortcomings and recommended improvements. See Citro and Michael (1995).

⁴Other alternative approaches suggest constructing measures of poverty that vary by geographic area or measures for time periods shorter than a year.

⁵ Specifically, the NAS panel recommend a scale equal to $(\text{number of adults} + \text{number of children} \times 0.7)^F$, where F ranges from 0.65 to 0.75.

2.B.2 Price Indices

Because the official poverty thresholds are adjusted over time using the CPI-U, bias in this price index will lead to bias in poverty trends. Although this bias can be very substantial for changes over long time periods, this criticism has received less attention in the poverty literature. The BLS has implemented several methodological improvements in calculating the CPI-U over the past 25 years. Although the BLS does not update the CPI-U retroactively, it does provide a consistent research series (CPI-U-RS) that incorporates many of these changes.⁶ As we will show, these two price indices yield very different patterns for poverty changes over longer periods (also see Jencks et al. 2004). However, a consensus view among economists is that the CPI-U-RS does not make sufficient adjustment for the biases in the CPI-U. Between 1972 and 2004 the CPI-U grew on average between 0.4 to 0.5 percent per year faster than the CPI-U-RS, with essentially all of this difference occurring before 1998. The estimates of the bias in the CPI-U over this period are much larger—about 1.3 percent per year between 1978 and 1995. Gordon (2006) argues that even with recent changes that make the CPI-U and CPI-U-RS essentially the same, a bias of 0.8 percent per year remains.

There are four types of biases in the CPI-U that have been emphasized: substitution bias, outlet bias, quality bias, and new product bias. Substitution bias refers to the bias in the use of a fixed market basket when people substitute away from high relative price items. Outlet bias refers to the inadequate accounting for the movement of purchases toward low price discount or big box stores. Quality bias refers to inadequate adjustments for the quality improvements in products over time, while new product bias refers to the omission or long delay in the incorporation of new products into the CPI. The Boskin Commission (Boskin et al. 1996), a group of eminent economists appointed by the Senate Finance Committee, provides the most authoritative source on the extent of these biases. They concluded that the annual bias in the CPI-U was 1.1 percentage points per year at the time of the report, but 1.3 percentage points prior to 1996 (the .2 percent extra due to an inadvertent bias added by a 1978 change). While there have been criticisms of the Boskin Commission (see Gordon 2006 for a summary), the

⁶The CPI-U-RS does not incorporate all of the methodological improvements to the CPI-U. See Stewart and Reed (1999) for more details.

conclusions have held up fairly well. Some of the critics such as Hausman (2003) suggest that the commission understated the bias. The Commission itself argued that the estimates were on the “conservative” side and tended to understate the bias (Boskin et al. 1996 Section VI, Gordon 2006 p. 13).

The Boskin Commission estimated CPI bias by piecing together direct estimates of the bias from a variety of sources. Costa (2001) and Hamilton (2001) use an alternative approach that essentially determines how much CPI-U adjusted income needs to be further adjusted so that spending patterns at adjusted income are unchanged over time. Costa (2001) concludes that the CPI-U overstated inflation by 1.6 percent per year between 1972 and 1994. Hamilton (2001) uses a similar approach on a different data source and concludes that the CPI-U overstated inflation by 3.0 percent per year between 1972 and 1981 and by 1.0 percent per year between 1981 and 1991.

All of these sources indicate that the upward bias in the CPI-U is even greater than the between 0.4 and 0.5 percent per year that the CPI-U-RS removes. An alternative price index, that we might call the Boskin index, would be the CPI adjusted for the bias that the Boskin Commission concluded is present. This index would be the CPI minus 1.3 percent per year for 1978 to 1996 and the CPI minus 1.1 percent per year after 1996. Some recent improvements to the CPI should probably lower the adjustment slightly in the most recent years (Gordon 2006), but given the conservative nature of the earlier Boskin Commission numbers and the higher numbers from other sources such as Costa and Hamilton, this index seems reasonable. The bias calculations in the literature and the resulting adjusted price index are intended for the entire population. One qualification to this discussion is that the market basket for the poor is different from that of the overall population, specifically food at home, rent and utilities have particularly large shares for the poor. The research on CPI bias for specific commodities provides mixed evidence on how the CPI bias for the poor might compare to the overall bias. Food at home is the main source of outlet bias that is estimated to be quite substantial in Hausman and Leibtag (2005). On the other hand, the largest single component of expenditures by the poor, rent, has been found to have bias in the opposite direction, i.e. true prices have gone up faster than suggested by the CPI through the mid-1980s (Gordon and vanGoethem 2005). Given that the rental weight in the CPI is only slightly lower than its share in the consumption of

the poor (because the cost of home ownership is calculated using a rental equivalent), but the food at home weight is much lower the difference in bias between a reweighted index and the CPI-U is likely small.

2.B.3 Units of Analyses and Resources

The official measure of poverty only includes the resources of individuals within a housing unit who are related by blood or marriage. This unit of analysis excludes from families the resources of unrelated individuals, such as a cohabiting partner. Citro and Michael (1995) and others argue that cohabitators should be included in the family unit. Analytically, the unit should be based on those who share resources. However, in the CPS ADF/ASEC we do not observe whether the cohabitor is sharing resources with other family members. Other surveys offer a more appropriate unit of analysis for measuring poverty. For example, the unit of observation in the Consumer Expenditure (CE) Survey, the primary source of micro-level expenditure data in the U.S., is the consumer unit, which includes all those related by blood and marriage as well as cohabitators that share responsibility for housing, food, or other living expenses, but excludes cohabitators who do not contribute to these expenses. Different units of analyses may affect trends if there are significant changes in cohabitation over time as suggested by Bumpass and Lu (2000). Haider and McGarry (forthcoming) show that the share of household income coming from those outside the nuclear family increased noticeably during the 1990s.

A large number of studies criticize the official poverty measure, which defines resources as pre-tax money income, because this measure fails to reflect appropriately the resources at the family's disposal. Pre-tax money income does not include taxes or noncash benefits such as the EITC, Food Stamps, housing or school lunch subsidies, or public health insurance. Some studies argue that these benefits should be included as part of family income because they have an important effect on the resources available for consumption. Several studies have constructed alternative measures of poverty using imputed values of taxes and noncash benefits that the Census has computed for the CPS ADF/ASEC since 1980. However, some of these valuations have important limitations. For example, the Census imputes a fungible value of Medicare and Medicaid that attributes a market value to these benefits only to the extent that they free up resources that exceed basic needs based on the USDA Thrifty Food Plan (see Data Appendix).

Thus, these fungible values imply that public health insurance has no value for families whose resources fall short of their basic needs, which surely understates the value of public health insurance for this group.⁷

Additional complications arise with the Census' valuation of subsidized and owner occupied housing. Rental subsidies are imputed using data on housing characteristics and gross rent in the 1985 American Housing Survey (AHS) (see Data Appendix). However, it is difficult to match AHS data with the CPS because the latter does not include information on the characteristics of the living unit. The number of bedrooms is imputed for the CPS sample using information on family composition. Studies have shown that weighted estimates of total housing subsidies using CPS data fall far short of the administrative numbers reported by the U.S. Department of Housing and Urban Development (Steffick, 1993). The Census' imputed value of annuitized home equity, which is included in some alternative poverty measures to capture the value of owner occupied housing, is particularly problematic not only because home equity is not observed in the CPS, but also because this imputed value is highly sensitive to changes in interest rates. For example, when interest rates rise, poverty will fall even if disposable income or consumption does not change. Given these limitations in the Census valuation of health insurance and housing, one should be cautious in drawing strong conclusions about poverty trends based on alternative poverty measures that include these imputed values. An alternative to measuring the resources available for consumption is to measure consumption directly, as discussed in the following subsection.

Within the literature on alternative measures of poverty there is considerable disagreement regarding how different resource measures affect trends in poverty. Many have argued that while the level of poverty differs significantly for different income based measures, the trends are quite similar across these measures. (Hoynes, Page, and Stevens, 2006; Dalaker, 2005; Short et al., 1999; Triest, 1998; U.S. Census, 1992, 1995). In contrast, others provide evidence that some of these alternative measures follow distinct patterns over certain periods. For example, JEC (2004) shows that adding the EITC to money income results in a noticeably

⁷ See Citro and Michael (1995), p. 223-237 for a discussion of the inclusion of health insurance and health expenditures in a measure of poverty.

greater decline in poverty during the 1990s. Jencks et. al. (2004b) present similar findings for child poverty.

Earlier work looking at consumption based measures of poverty suggests that changes in these measures differ from income based measures. For example, comparing consumption to official thresholds, Cutler and Katz (1991) suggest that consumption poverty rose more than income poverty during the 1970s. Similarly, Johnson (2004) shows that consumption poverty increased more than income poverty during the 1970s and then remained steady through 1995. Using alternative equivalence scales, there is evidence that consumption poverty fell considerably more than income poverty from 1980 through 1995 (Slesnick 2001). In contrast, a recent working paper argues that changes in consumption poverty are similar to changes in income poverty in the 1980s and 1990s if the latter measure includes taxes and noncash benefits (Bavier 2006).

2.C. The Merits of Consumption Measures of Poverty

Throughout this paper we will emphasize important differences between income and consumption based measures of poverty. In previous work we present fairly strong evidence that consumption provides a more appropriate measure of well-being than income for families with few resources (Meyer and Sullivan 2003). Conceptual arguments as to whether income or consumption is a better measure of the material well-being of the poor almost always favor consumption. For example, consumption captures permanent income (for further discussion see Cutler and Katz 1991; Slesnick 1993; and Poterba 1991). Income measures fail to capture disparities in consumption that result from differences across families in the accumulation of assets or access to credit. Also, consumption reflects the insurance value of government programs, better accommodates illegal activity and price changes, and is more likely to reflect private and government transfers. In addition to these reasons, data from the CE Survey are better suited than data from the CPS for imputing some non-money resources, particularly those related to housing. For example, a better value of housing subsidies can be computed using CE Survey data because the survey provides information on out of pocket rent and the characteristics of the living unit including the total number of rooms, the number of bathrooms and bedrooms, and appliances such as a wash, dryer, etc. These characteristics can be used to impute a total rental value as we will explain in Section 3.B. In addition, for homeowners the CE Survey

provides self reported values of the rental equivalent of the home, which is arguably a better measure of the value of owner-occupied housing than an imputed annuitized value of home equity.

That consumption can be divided into meaningful categories, such as food and housing, provides two additional advantages over income: expenditures on categories such as food and housing are of interest in their own right, and one can better account for relative price changes. Meyer and Sullivan (2003) also shows that for single mothers consumption is a better predictor of well-being than income. For example, we examine other measures of material hardship or adverse family outcomes for those with very low consumption or income. These problems are more severe for those with low consumption than for those with low income, indicating that consumption does a better job of capturing well-being for these families.

Evidence on the tendency of surveys to capture accurate information on income or consumption is more evenly split. For most people, income is easier to report given administrative reporting and a small number of sources of income. However, for analyses of families with few resources these arguments are less valid. These families tend to have many income sources. Income appears to be substantially under-reported, especially for categories of income important for those with few resources. Furthermore, the extent of under-reporting appears to have changed over time. Meyer and Sullivan (2003) and Meyer, Mok and Sullivan (2006) provide evidence that commonly used household surveys have substantial under-reporting of key components of income. Weighted micro-data from these surveys, when compared to administrative aggregates, show that government transfers and other income components are severely under-reported and the degree of under-reporting has changed over time. Comparisons of survey micro-data to administrative micro-data for the same individuals also indicate severe under-reporting of government transfers in survey data. Meyer, Mok and Sullivan show that the share of key transfers including Food Stamps and TANF that is not reported in the CPS has doubled in recent years.

There is also some under-reporting of consumption, but because consumption often exceeds income, we might be more concerned about over-reporting of consumption, of which there is little evidence. Nevertheless, past work (Giesman 1987, Slesnick 1992, Garner et al. 2006, Attanasio et al. 2006) has emphasized a discrepancy between CE aggregates and Personal

Consumption Expenditure (PCE) data from the National Income and Product Accounts (NIPA). Some of this evidence is easily misinterpreted and is less applicable to the current analyses than it may seem for several reasons. First, many published comparisons are based on the integrated data that combine CE Diary and CE Interview data rather than the Interview data used exclusively here. Second, the poor consume a different bundle of goods than the general public, so that aggregate analyses do not reflect the composition of consumption for the poor. Third, the PCE numbers cover a different population, are defined differently from the CE, and are the product of a great deal of estimation and imputation that is subject to error.

In Table 1 we report comparisons of CE Interview Survey values weighted by population to corresponding categories of PCE data. The categories we report are food and housing, the two largest consumption categories for the poor, accounting for 70 percent of consumption of those near the poverty line in 2004. To improve comparability, we combine rent with utilities since rent often includes some utilities and space rent (exclusive of utilities) cannot be obtained in the CE. We divide food consumption into food consumed at home and food consumed away from home. The numbers indicate fairly steady ratios of CE to PCE expenditures on food at home and rent plus utilities. For food at home, on average the CE/PCE ratio is about 0.80 and for rent plus utilities the ratio is about 0.95. The numbers do indicate a noticeable decline over time in the ratio for food away, which leads to a decline in overall food. Since food away is a much smaller share of consumption for the poor, a share weighted ratio for total food expenditures for the poor would fall much less over time.

We should emphasize that the PCE coverage is larger. The PCE numbers include purchases by nonprofits in the totals, as well as purchases by those abroad, on military bases and in institutions. All of these categories are not included in CE expenditures. More importantly, the NIPA PCE values are constructed through a complex process that relies on input-output tables to impute sales to final sector and imputed wholesale and retail markups and imputed taxes. Thus, the PCE values are not as reliable as the administrative aggregates to which we compare government transfers, for example. The PCE numbers should not be taken as truth. An indication of the error in the PCE calculations is the substantial revisions that are made to the historical data from time to time (Slesnick 1992). The Bureau of Economic Analysis reported that in 1992 more than half of the difference between PCE and CE consumer spending was due

to coverage and definitional differences (summarized in GAO 1996).

3. Data and Methods

3.A The Current Population Survey

Our analyses of trends in poverty draw on income and consumption data from the Current Population Survey (CPS) and the Consumer Expenditure Interview (CE) Survey. The CPS is a nationally representative monthly survey of approximately 60,000 households. Once each year the CPS includes the Annual Social and Economic (ASEC) Supplement, formerly called the Annual Demographic File (ADF).⁸ This supplement is the most commonly used source of nationally representative income data and is the source of official U.S. poverty statistics. The ASEC includes questions regarding income for the previous calendar year. Respondents report the income amounts for a number of different sources that are included in the money income measure used to determine official poverty statistics.⁹ In addition, the respondents report receipt of noncash benefits including Food Stamps, housing subsidies, and subsidies for reduced or free school lunch. Starting with the 1980 survey, the ASEC/ADF also provides imputed values for these and other noncash benefits including Medicaid and Medicare, the value of housing equity converted into an annuity, and the value of employer health benefits. The Data Appendix provides more details on these noncash benefits. While respondents do not report income taxes, since 1980 imputed values for taxes and credits have been included in the ASEC/ADF.¹⁰ From these income data, we construct a measure of money income that follows the definition used by the Census to calculate official poverty statistics. In addition we construct several different measures of disposable income that include imputed values of taxes and noncash income as described below and in the Data Appendix.

⁸ The ASEC is administered to the March sample of the CPS as well as a random subsample of the respondents in the February and April CPS, raising the sample size to nearly 100,000 households. Prior to 2002, the supplement was only included in the March survey.

⁹ These sources, as reported in the ASEC codebook, include: earnings; net income from self employment; Social Security, pension, and retirement income; public transfer income including Supplemental Security Income, welfare payments, veterans' payment or unemployment and workmen's compensation; interest and investment income; rental income; and alimony or child support, regular contributions from persons outside the household, and other periodic income.

¹⁰ Prior to 1992, tax and noncash benefit data are available in separate data files. Much of these data are available at <http://www.census.gov/housing>.

3.B The Consumer Expenditure Survey

The CE Survey, which is conducted by the Bureau of Labor Statistics (BLS), is a rotating panel survey of approximately 7,500 families each quarter (5,000 prior to 1999). Each family in the survey reports spending for a large number of expenditure categories for up to four consecutive quarters. Expenditure data are reported at the level of the consumer unit, which is defined as either a group of individuals that are related by blood or marriage, a single or financially independent individual, or two or more persons that share resources.¹¹ Expenditure data are available for 1972, 1973, and annually beginning in 1980. However, in 1982 and 1983, the survey only included respondents from urban areas.¹² For more information on the CE Survey see Meyer and Sullivan (2003) or Bureau of Labor Statistics (1997).

Our measures of family consumption in the CE Survey are derived from expenditure questions. To convert reported expenditures into a measure of consumption, we make a number of adjustments. First, reported expenditures on durables tend to be lumpy because the entire cost of new durable goods is included in current expenditures. To smooth these lumpy vehicle expenditures, we convert vehicle spending to a service flow equivalent. For a detailed description of how we calculate these service flows, see Meyer and Sullivan (2001).¹³ Second, consumption does not include spending that is better interpreted as an investment such as spending on education and health care and outlays for retirement including pensions and social security.¹⁴

¹¹ Individuals are considered to be sharing resources if expenses are not independent for at least two of the three major expense categories: housing, food, and other living expenses.

¹²Currently we examine CE Survey data from 1984 through 2004. We plan to extend our analyses back to 1972. There are limitations in the data prior to 1984 that are important for calculating consumption. For example, we cannot identify consumer units living in public or subsidized housing prior to 1982. Also, in 1980 and 1981, homeowners do not report a rental equivalent.

¹³We are in the process of using detailed vehicle characteristics available in the CE Survey to estimate an improved flow value of car ownership. In addition, we hope to sensibly measure the value of public and private health insurance. The worker and firm cost of employer provided insurance can be obtained from the Mercer/Foster Higgins National Survey of Employer Sponsored Health Plans. A value can be put on Medicaid and Medicare based on expenditures per person in a given demographic group.

¹⁴ We also exclude spending on individuals or entities outside the family, such as charitable contributions and spending on gifts to non-family members. This category is small relative to total consumption.

Third, housing consumption is measured as the reported rental equivalent of the home for home owners, and as the reported out of pocket spending on rent for non-homeowners. However, respondents living in government or subsidized housing do not report a rental equivalent, and the CE Survey only collects information on out of pocket expenditures for housing. To get an appropriate measure of consumption for these families, we impute a rental value using reported information on their living unit including the number of rooms, bedrooms, and bathrooms, and the presence of appliances such as a microwave, disposal, refrigerator, washer, and dryer. Specifically, for renters that are not in public or subsidized housing we regress log rent on the housing characteristics mentioned above as well as a number of geographic identifiers including state, region, urbanicity, and SMSA status, as well as interactions of a nonlinear time trend with appliances. We then estimate a quantile regression and use the estimated coefficients to predict the 40th percentile of rent for the sample of families that do not report full rent because they reside in public or subsidized housing.

3.C Methods

In the analyses that follow, we examine the degree to which changes in poverty over time differ depending on the measurement approach used. We consider a number of poverty measures that differ from the official measure by using alternative equivalence scales, price indices, resource sharing units, and resource measures. For much of the analyses we will use an equivalence scale that follows the NAS panel recommendations: $(A + PK)^F$, where A is the number of adults in the family and K is the number of children. The panel recommended that the child proportion of an adult, P, be equal to 0.7 and that the economies of scale factor, F, fall in the range 0.65 to 0.75. In most cases we will use the midpoint of this range for F, although we also examine how patterns vary with F and P. In the CPS, we examine two different resource sharing units: the family and the household. For the CE Survey, the only unit of analysis that we observe is the consumer unit.

We analyze changes in poverty using different measures of resources. We will consider measures of both the resources available for consumption (i.e. income) as well as measures of the resources consumed. We will focus on four different income measures of resources using data from the CPS: 1) money income, 2) after-tax money income, 3) after-tax money income plus noncash benefits, and 4) after-tax money income plus noncash benefits plus annuitized

home equity. These disposable income measures follow the suggestions from Citro and Michael (1995), and are used in Census calculations of alternative poverty measurement (U.S. Census 2005, 2006), as well as other recent studies of poverty. A detailed definition of each of these measures is available in the Data Appendix. We will also examine several consumption based measures of resources including consumption as defined in the previous section, expenditures, and measures of consumption net of work expenses.

To facilitate comparisons we anchor each measure by using the threshold that equates poverty in the baseline year (1984). Specifically, for each alternative poverty measure we find the threshold such that the poverty rate for that scale-adjusted measure is equal to that of the official poverty rate in 1984 (14.4 percent).¹⁵ Anchoring our alternative measures to the official measure in 1984 allows us to examine the same point of the distribution initially so that different measures do not diverge simply because of differential changes at different points in the distribution.¹⁶ To obtain thresholds for other years, the thresholds are adjusted for inflation using different price indices including the CPI-U, the CPI-U-RS, and the PCE. We also consider other thresholds including 25 percent, 50 percent, 75 percent, 125 percent, and 150 percent of the 1984-anchored threshold for each alternative measure.

¹⁵In 1984, the 14.4 percentile of the distribution is actually quite similar across several of our different scale adjusted measures of resources. For example, the ratio of the threshold for after-tax money income to that of money income is 0.95; for after-tax money income plus noncash benefits, 1.11; for after-tax money income plus noncash benefits plus annuitized home equity, 1.29; and for consumption, 0.99.

¹⁶Triest (1998) and JEC (2004) use a similar approach.

4. Results

4.A Different Prices, Equivalence Scales, and Resource Sharing Units

Figure 1 shows changes since 1984 for various measures of poverty. Each measure is constructed as described above so that the poverty rate is the same as the official measure in 1984 (14.4%). The figure then plots differences between the poverty rate in each given year and the poverty rate in 1984. All five of the data series plotted in Figure 1 are for the same measure of resources—money income. This figure shows that changing from the equivalence scale implicit in the official thresholds to one that is more generally accepted does not greatly alter the change in the poverty rate. Using the same measure of resources (money income) and the same price index (CPI-U), there is little difference in the change in poverty between official income poverty and poverty calculated using the NAS equivalence scale for the years 1972 through 2004.¹⁷ These patterns are not appreciably different for small changes in F or P or for a 3-parameter equivalence scale.¹⁸

Figure 1 also shows that changes in poverty are noticeably different for poverty measures adjusted by price indices other than the CPI-U. By 2004, the poverty rate calculated using a threshold adjusted by the CPI-U-RS is nearly a full percentage point below the rate calculated using a threshold adjusted by the CPI-U. The difference is 1.4 percentage points if the PCE price index is used. Differences are most evident in the late 1970s. Using the same equivalence scale, between 1976 and 1980 poverty increases by more than a percentage point when thresholds are adjusted by the CPI-U, while poverty falls nearly half of a percentage point when adjusted by the CPI-U-RS.¹⁹ This difference primarily results from the significant change the BLS made in 1983 to the methodology for determining prices for owner-occupied housing in the

¹⁷Citro and Michael (1995) show that their recommended equivalence scale does not have a significant effect on changes in poverty between 1979 and 1992 for economies of scale parameters 0.65 and 0.75 (Table 5-11). Triest (1998) finds that poverty rates rise faster during the 1970s and early 1980s for measures adjusted by the NAS scale than for a modified measure of official poverty.

¹⁸We find that changes in poverty between 1972 and 2004 are remarkably similar for values of F between 0.65 and 0.75, for values of P between 0.7 and 1, or using the 3-parameter scales reported in Short et. al. (1999) and Betson (1996). Poverty rates increase significantly more during this period if economies of scale are considered to be large (i.e. $F = 0.25$).

¹⁹These results are similar to those reported in Burtless and Smeeding (2001).

CPI-U, shifting from using the purchase price of residential homes to a rental equivalent value of the home.

We also see that the poverty rate falls somewhat more when the resource sharing unit is the household rather than the family. From 1984 to 2004, the poverty rate based on the household falls by 0.7 percentage points more than a similarly defined measure based on the family. Most of this difference occurs between 1992 and 2004. There is little difference in the changes in these poverty measures for the years 1972 to 1992. Together, the differences in trends are quite large. Between 1984 and 2004, the poverty rate using the money income of the household, the NAS scale, and a threshold adjusted by the PCE falls by 2.3 percentage points more than the official poverty measure, which translates into about 6.6 million individuals.

4.B Different Resources

Figure 2 shows how poverty trends differ for various measures of income. For comparison, we have reproduced official income poverty and money income poverty (NAS scale, CPI-U-RS) from Figure 1. Adding taxes to money income increases the decline in poverty, particularly in the 1990s. Between 1993 and 1998, after-tax money income poverty fell by a full percentage point more than the rate for money income. This is consistent with a significant expansion of the EITC during this period. Since 1998, there has been little change in the difference between these two measures of poverty. Adding the value of noncash government benefits (food stamps, subsidies for housing and school lunch, the fungible value of Medicare and Medicaid, and the value of employer provided health benefits) has little additional impact on changes in poverty. However, adding the annuitized value of home equity offsets much of the effect of the EITC. Measures that include the annuitized value of home equity may fluctuate for reasons that are not directly related to changes in well-being because this value is very sensitive to changes in interest rates. For example, poverty based on this measure remains unchanged between 1984 and 1986—a period of significantly declining interest rates—while all other income based measures fall by a percentage point or more. Dalaker (2005) suggests that the similarity in trends between poverty based on money income and poverty based on money income plus noncash benefits and the annuitized value of home equity indicates that poverty trends are similar for different measures of resources. However, the results in Figure 2 show that how one defines income does have an important effect on changes in poverty for certain periods. For

example, a measure of poverty that includes taxes and noncash benefits but excludes the annuitized value of home equity yields a poverty rate that declines by about two percentage points more than one based on money income alone for the period from 1985 to 1995. In contrast, these different measures of income poverty exhibit very similar changes for the period from 1997 to 2004.

Using data from the CE Survey, we report changes in consumption based measures of poverty from 1983 to 2004 in Figure 3. We also show changes for official income poverty and a more comprehensive income based poverty measure from Figure 2 for comparison. Again, we determine the thresholds as those that yield a poverty rate in 1984 equal to the official measure. Thus, for all measures in Figure 3, the poverty rate is 14.4 percent in 1984. As with measures of disposable income, consumption poverty falls by more than the official poverty measure. Between some periods, the change in consumption poverty is similar to that of disposable income poverty. For example, between 1984 and 2002, consumption and disposable income based poverty both fall by about 5 percentage points. Recent research has presented patterns such as these as evidence that consumption and income provide very comparable measures of well-being at the bottom (Bavier, 2006). However, our analyses reveal important differences between the changes in consumption and income based poverty. Figure 3 shows that these measures diverge over some periods. Disposable income based poverty declines by more than consumption based poverty between 1994 and 2000. And, between 2000 to 2004 income based poverty rises while consumption based poverty does not change significantly. Moreover, we will provide evidence below of sharp differences for deep poverty, poverty among the elderly, and poverty gaps.

Previous research has shown that employment rates rose significantly during the 1990s for single mothers—a group that accounts for a substantial fraction of families in poverty. Because of these increases in work, some of the decline in consumption poverty may reflect greater work expenses rather than greater consumption of non-work related goods and services. Unfortunately, we cannot directly disentangle work-related expenses from other expenditures in the CE Survey. To determine whether recent changes in consumption poverty are driven by changes in work-related expenses, we consider an alternative definition of consumption: one that subtracts out child care and domestic services. As shown in Figure 3, subtracting out these

work expenses has little effect on changes in consumption based poverty. If we subtract a broader measure of work expenses (not shown)—one that also excludes all spending on clothing and transportation—the poverty rate falls by 1.5 percentage points more than does consumption poverty between 1984 and 1991. Since 1991 poverty based on this measure has fallen slightly less than has consumption poverty, but this difference is less than 0.5 percentage points. Figure 3 also shows that our trends for consumption poverty are not driven by our approach for imputing service flows for durables or housing consumption for those in public or subsidized housing. For much of this period changes in expenditure based poverty mirror the changes for consumption based poverty.

4.C Deep Poverty, Near Poverty, and Poverty Gaps

To this point, our analyses of poverty have focused on a single threshold for each poverty measure. To determine how changes in poverty differ at different points in the cumulative distribution of resources, we also examine other thresholds ranging from 0.25 to 1.5 times the original threshold. A subset of these results are reported in Table 2 for several income and consumption based measures of poverty. At 150 percent of our original threshold (Columns 1 through 4) we again see that disposable income and consumption based measures of poverty have decreased more in recent years than has poverty based on money income. However, changes for consumption based measures of poverty are similar to those that are based on disposable income.²⁰ At half of our original threshold (Columns 9 through 12), more distinct differences are evident between the income and consumption based measures. Deep poverty changes very little for our disposable income measures of poverty—at this threshold, the deep poverty rate for after-tax income plus noncash benefits (Column 10) decreases by only 0.2 percentage points from 1984 to 2004. By contrast, the deep poverty rate for our consumption based measure (Column 11) falls by more than a percentage point—a drop of more than fifty percent.

In order to examine more fully the trends in well-being of disadvantaged households and the depth of poverty, we also examine poverty gaps for the measures of poverty discussed above.

²⁰ Due to the less dispersed distribution for consumption, the level of consumption poverty is higher than that of income poverty at this higher cutoff even though the original thresholds are very similar.

We define the gap for a given poverty measure as the sum of the difference between the poverty threshold and family resources across all poor families or unrelated individuals. We express the gaps on a per poor person basis by dividing by the number of persons in poverty for that particular poverty definition. Comparisons of changes in the per person poverty gap across different measures of poverty reveal sharp differences. In Table 3 we see that the per person gap based on the official measure (Column 1) rises steadily throughout the past two decades. The gap per person is 27 percent higher in 2004 than in 1984. Based on a measure that uses the NAS scale and the CPI-U-RS (Column 2), the gap is somewhat smaller in levels, but the pattern over time is similar to that of the gap based on the official measure. For the disposable income based measure (Column 3), the gap increases even more than the gap based on money income; the former increases by 34 percent over the past two decades. In contrast, the consumption based measures of the poverty gap per person (Columns 4 through 6) tell a very different story. The level of the gap is much lower for the consumption based measures, reflecting the tighter distribution of consumption. Also, unlike income, the consumption based gaps fall over time. This drop is evident for all measures of consumption poverty.

The sharp contrast between changes in income and consumption based poverty gaps is even more evident within demographic groups. For families with a head 65 or older (Table 4), we see increases in income based poverty gaps of between 33 and 48 percent between 1984 and 2004 (Columns 1 through 3). For this same group, consumption based poverty gaps (Columns 4 through 6) fall during this period, although some of the consumption based measures indicate that the gap rises in the most recent decade. For single mother headed families (Table 5), we see smaller increases in income based gaps and larger decreases in consumption based gaps over the past two decades.

The difference in recent changes in the poverty gap has important implications for interpreting recent changes in poverty. For example, income based gaps suggest that while poverty has fallen over the past two decades those that remain in poverty are more likely to be in deep poverty. By contrast, the pattern for consumption based gaps suggests that as overall poverty fell between 1984 and 2004 the degree to which families were in deep poverty also fell.

4.D Demographics and Poverty

Some of the most striking differences in changes in poverty are evident within

demographic groups. In Figure 4 we show income and consumption measures for those 65 and over. For each measure the same threshold as in Figures 2 and 3 is used. Noticeable differences are evident even across income measures of poverty. For example, using the same scale and price index, poverty based on after-tax money income plus noncash benefits falls by less than the pre-tax money income based measure between 1984 and 1992. This difference is driven by changes in the fungible value of Medicare. Changes in poverty among the elderly are particularly sensitive to the inclusion of the annuitized value of home equity because this group is more likely to own their own home. Poverty among the elderly based on an income measure that includes the annuitized value of home equity is the same in 2004 as in 1984. This stability reflects falling interest rates over this period, which reduces the annuitized value of housing as calculated by the Census Bureau. The pattern for consumption based measures of poverty differs sharply from these income based measures. Between 1984 and 2004, consumption poverty falls by 8.6 percentage points. Since 1998, consumption poverty has remained steady, while a measure that excludes housing consumption has risen somewhat.

Changes in poverty for children under 18 also differ across measures (Figure 5). For this group, the disposable income based measure of poverty falls by 3.7 percentage points more than does money income poverty between 1984 and 1995. Changes for these two measures follow a more similar pattern after 1995. Our consumption based measure of poverty falls by less than does disposable income based measures of poverty. However, when a broad definition of work expenses is excluded (not shown), changes in consumption based poverty are similar to those for disposable income based measures.

Some of the sharpest drops in poverty during the 1990s are evident for single mother headed families (Figure 6). For much of this period changes in disposable income and consumption based measures of poverty are fairly similar. After 2001, most of the income based measures of poverty rise. More noticeable differences between income and consumption poverty are evident at lower points in the distribution. For example, at 50 percent of our baseline threshold (not reported), disposable income based measures of poverty for single mothers increase modestly after 1997 while consumption based measures appear to fall slightly.

A comparison of the demographic characteristics of the income poor and the consumption poor also reveals some important differences. As shown in Table 6, the

consumption poor are more likely to be minority, more likely to live in married-parent families, and, in recent years, less likely to be elderly than the income poor. In contrast, the demographic characteristics of the official income poor do not differ significantly from those of the disposable income poor. The differences between the characteristics of the consumption and income poor do not appear to be the result of sampling differences across the two surveys, as the demographic characteristics of the full samples (Columns 1, 2, 6, 7, 11, 12) are very similar across surveys. In addition, these differences between the consumption and income poor do not change noticeably over time. However, we do see some changes in the characteristics of the poor over time that are evident regardless of how poverty is defined. For example, the poor in the 1980s are more likely to be either black or white and less likely to be in the "other" family type, which includes families with cohabiting adults.

4.E Choosing Between the Different Measures of Poverty

In this study we present a number of alternative income based measures of poverty that address well-known flaws in the official measure. Some of these alternatives offer clear improvements. For example, a disposable income based poverty measure is an improvement on the official measure because the former better reflects the resources available for consumption. A measure of resources will be more closely tied to well-being if it includes taxes and noncash benefits such as Food Stamps, housing subsidies, and school lunch subsidies, and incorporating public health insurance benefits such as Medicaid and Medicare. However, given the important limitations in the Census valuations for some of these alternative resources including health insurance, housing subsidies, and valuations of owner occupied housing, one should be cautious in drawing strong conclusions about poverty trends based on alternative poverty measures that include these imputed values.

Although disposable income based poverty measures better capture the resources available for consumption than does the official measure, we argue that it is preferable to measure consumption directly. Among other reasons, as discussed in Section 2.C, consumption better captures permanent income, the insurance value of government programs, and some private and government transfers. Also, evidence shows that transfer income is significantly under-reported and the extent of under-reporting appears to have changed over time. In addition to these reasons, consumption data are better suited for imputing some non-money resources,

such as housing subsidies and the value of owner occupied housing. Furthermore, the unit of observation in the CE Survey, the consumer unit, is more appropriate for measuring poverty because, by definition, it includes those living together that pool resources for consumption.

Regardless of the approach taken to measure resources, changes in poverty over time should be calculated using an accurate price index. While the methodology for constructing the CPI-U has been adjusted a number of times during the past two decades, the BLS does not adjust this price index historically to reflect these improvements. As a result, estimates of changes in poverty that rely on CPI-U adjusted thresholds will be biased, particularly if the change is over a long time period. As we show in Figure 1 this bias leads to significant differences in changes in poverty over the past three decades. Thus, analyses of changes in poverty should use a more accurate price index such as the CPI-U-RS. However, it is likely that the CPI-U-RS does not go far enough in adjusting for biases, as discuss in Section 2.B.

5. Conclusions

The official poverty rate suggests that poverty has changed very little over the past three decades. Other measures of poverty based on household disposable income or consumption, rather than pre-tax family income, indicate that poverty has decline noticeably in recent years. This paper examines the measurement of poverty in the United States from 1972 through 2004. We investigate how poverty rates and poverty gaps have changed over time, explore how these trends differ across demographic groups, and contrast these trends for several different income and consumption based measures of poverty. We also examine how sensitive different measures of poverty are to assumptions about equivalence scales, price adjustments, and the definition of the resource sharing unit.

We document sharp differences, particularly in recent years, between different income based poverty measures, and between income and consumption based poverty rates and gaps. We find that sensible changes from the official price index and resource sharing unit tend to lead to substantial declines in measured income poverty rates, but our equivalence scale changes have only a small impact. Disposable income measures that incorporate transfers and fringe benefits often indicate declines in poverty rates of several percentage points over the past two decades. Consumption based poverty rates often indicate large declines, even in recent years when income

based poverty rates have risen. Patterns are very different across demographic groups, with aggregation hiding generally larger differences between income and consumption poverty rate changes, especially for the elderly.

Income and consumption poverty gaps have generally moved sharply in opposite directions in the last two decades with income gaps rising, but consumption gaps falling.

Since both the poverty rate and the poverty gap per poor person have fallen appreciably more in consumption data than in income data, the overall picture of the change in poverty is much more favorable using consumption measures than income measures. This observation as well as our other findings renew the question as to why income and consumption measures differ. Further evidence on the importance of measurement errors, saving and dissaving in explaining the differences would be especially valuable.

We argue that consumption poverty is preferred for measuring changes in the well-being of the worst off. However, there are some practical limitations to an official, consumption based measure of poverty. Small sample sizes in the CE Survey relative to the CPS make it difficult to compute reliable poverty statistics at the state and local level. Also, many government transfer programs determine eligibility by comparing the applicant's income to a standard of need which is tied to the poverty line. While consumption is better suited to determine standards for benefit amounts for transfer programs such as Food Stamps and TANF, the ease of reporting income makes it the more appropriate measure for determining eligibility for these programs.

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Data Appendix

A. Measures of Income in the CPS

Money Income: The Census definition of money income that is used to measure poverty.

After-tax Money Income: adds to money income the value of tax credits such as the EITC, and subtracts state and federal income taxes and payroll taxes, and includes capital gains and losses.

After-tax Money Income Plus Noncash Benefits: this adds to After-tax Money Income the cash value of Food Stamps, housing subsidies, school lunch programs, fungible value of Medicaid and Medicare, and the value of employer health benefits.

After-tax Money Income Plus Noncash Benefits Plus Annuitized Home Equity: this adds to After-tax Money Income Plus Noncash Benefits the value of housing equity converted into an annuity.

B. Measures of Consumption in the CE Survey

Expenditures: This summary measure includes all expenditures reported in the CE Survey. Expenditures are reported for three-month periods. We scale these quarterly expenditures to an annual level.

Consumption: Consumption includes all spending in total expenditures less spending on health care, education, pension plans, and cash contributions. In addition, housing and vehicle expenditures are converted to service flows. The rental equivalent for owned dwellings is used instead of spending on mortgage interest, property taxes, and spending on maintenance, repairs, and insurance. For those in public or subsidized housing, we impute a rental value using the procedure outlined in the text. For vehicles we estimate the value of new car purchases for each household that owns a car, and calculate a service flow that is a function of this predicted value of vehicle purchases and the age of each vehicle the household owns assuming a constant geometric vehicle depreciation of 5 percent per quarter. See Meyer and Sullivan (2001) for more details.

Work Expenses: Includes expenditures on domestic services, baby sitting and child day care.

C. Noncash benefits in the CPS

Below is a brief summary of the methods used to determine noncash benefits in the CPS ADF/ASEC. This information comes from various reports issued by the U.S. Census. For more details see U.S. Census (1992, 1999), Appendix B.

Face Value of Food Stamps: The value of food stamps for each family is determined using reported information on the number of persons receiving food stamps in the household and the

total value of food stamps received.

Income Value of School Lunch Program: The CPS imputes a value for lunch subsidies for families that report having children who receive free or reduced price school lunch. The value is determined using information on the dollar amount of subsidy per meal as reported by the USDA. If a child participates in school lunch, it is assumed that the child receives that subsidy type (reduced price or free) for the entire year.

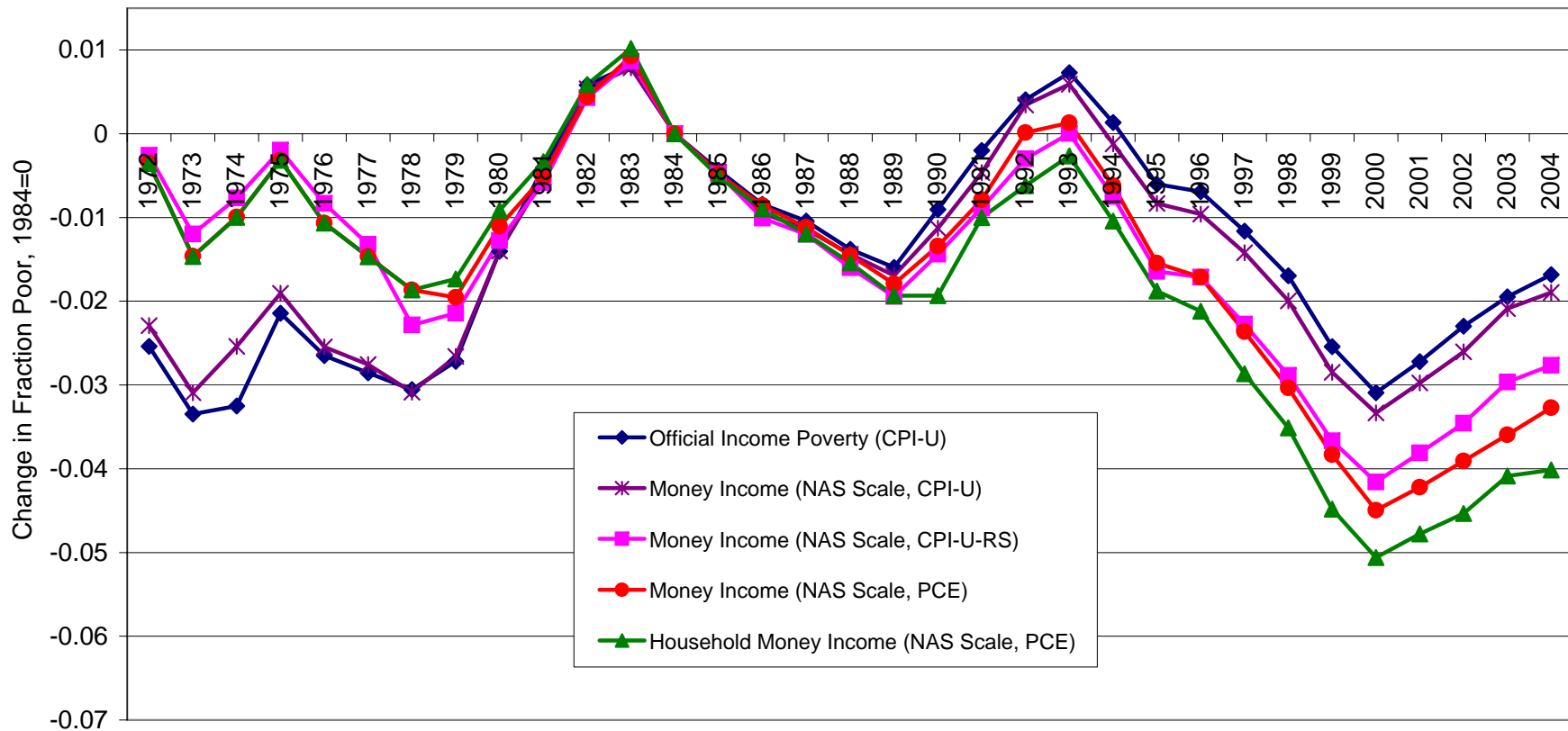
Fungible Values of Medicaid and Medicare: The CPS imputes a “fungible” value of Medicaid/Medicare for families that include an individual who is reported to be covered by Medicaid/Medicare. Fungible means that “Medicare and Medicaid benefits are counted as income to the extent that they free up resources that could have been spent on medical care.” Thus, these programs have no income value if the family does not have resources (the sum of money income, Food Stamps, and housing subsidies) that exceed basic needs. If these resources do exceed basic needs, then the fungible value of medical benefits is equal to the smaller of: a) the market value of these benefits and b) the value of resources less basic needs. The market value of Medicaid is equal to mean government outlays for families in a given state and risk class. The four risk classes are: 65 and over, blind and disabled, 21-64 nondisabled, and less than 21 nondisabled. The market value of Medicare is equal to mean government outlays for families in a given state and risk class. The two risk classes are: 65 and over and blind and disabled.

Housing Subsidies: The CPS imputes a value of housing subsidies for households that report living in public housing or receiving a public rent subsidy. The value of the subsidy is calculated as follows. Using data from the 1985 American Housing Survey (AHS), reported rent for unsubsidized two-bedroom housing units is regressed on housing characteristics. Separate regressions are estimated for each of four regions, and the coefficients from these models are used to predict rent for those living in subsidized units. The subsidy for those in subsidized housing is then calculated as the difference between out of pocket rent and imputed total rent. Region-specific adjustment factors for smaller and larger units are estimated using data on rent for units with different numbers of bedrooms in the 1985 AHS. Thirty-six different subsidy values are calculated which vary by four regions, three income brackets, and three different unit sizes. Because unit size is not observed in the CPS, this is imputed from family composition. Subsidy values for each year are based on estimates using the 1985 data, but are updated to reflect changes in shelter costs using the CPI residential rent index. Before 1985 March CPS data were linked to the Annual Housing Survey. For example, the 1980 March CPS was linked to the 1979 Annual Housing Survey.

Employer Contributions to Health Insurance: The CPS imputes a value of health insurance for persons who were covered by an employer health insurance plan. Using data from the 1977 National Medical Care Expenditures Survey, the value of the employer contribution was imputed as a function of observable characteristics including earnings, full-time/part-time, industry, occupation, sector, public/private, residence, and personal characteristics of the worker such as age, race, marital status, and education, and information on whether the employer paid all, part, or none of the cost of health insurance as reported in the supplement.

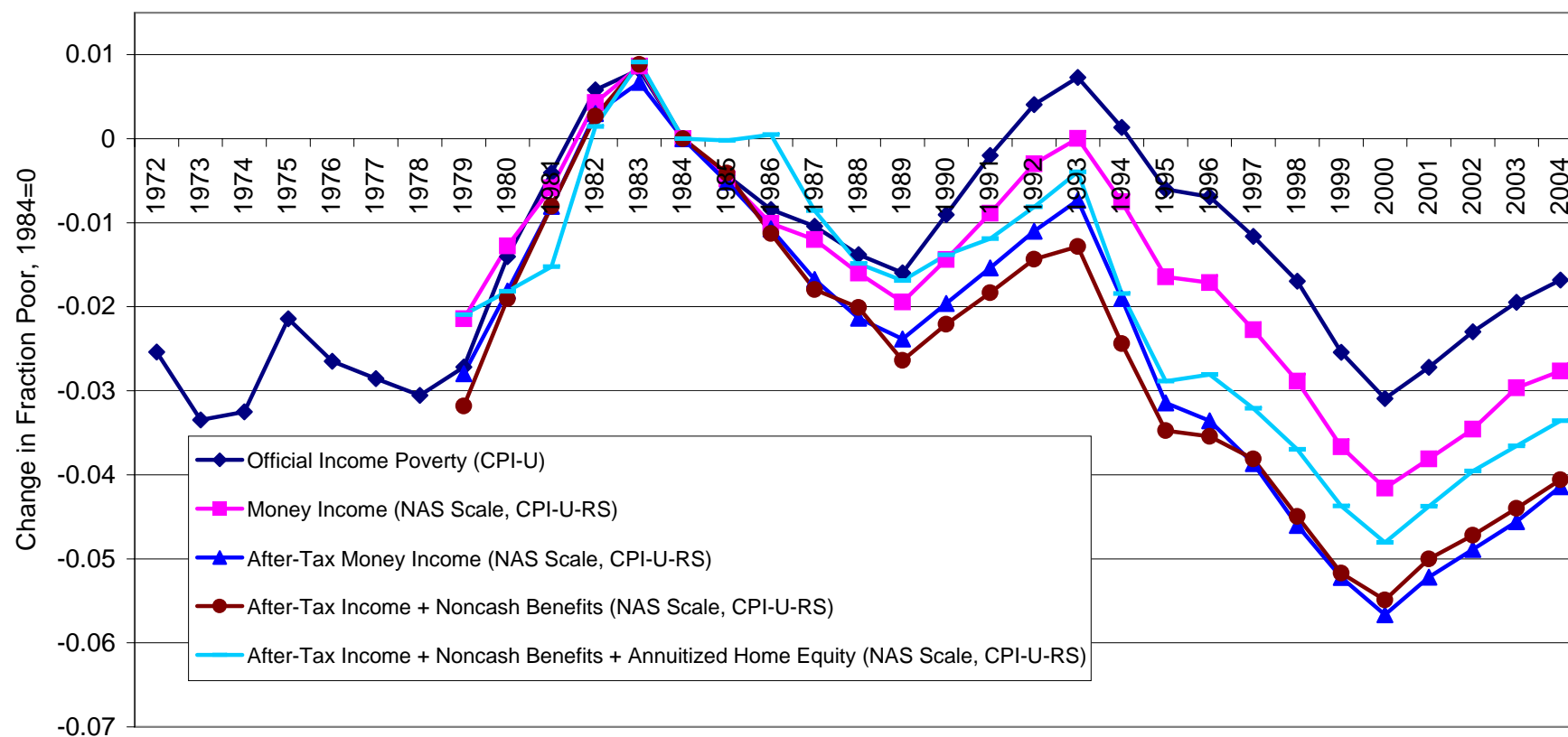
Net Return on Home Equity (annuitized value): Using data from the 1989 AHS, a value of home equity is imputed for each CPS household by matching the two surveys on observable characteristics. This equity is converted to an annuity, using a rate of return based on high grade municipal bonds from the Standard and Poors series. The value of home equity is net of imputed property taxes.

Figure 1: Change in Income Poverty Using Different Equivalence Scales, Price Indices, and Resource Sharing Units, CPS-ASEC/ADF, 1984 = 0



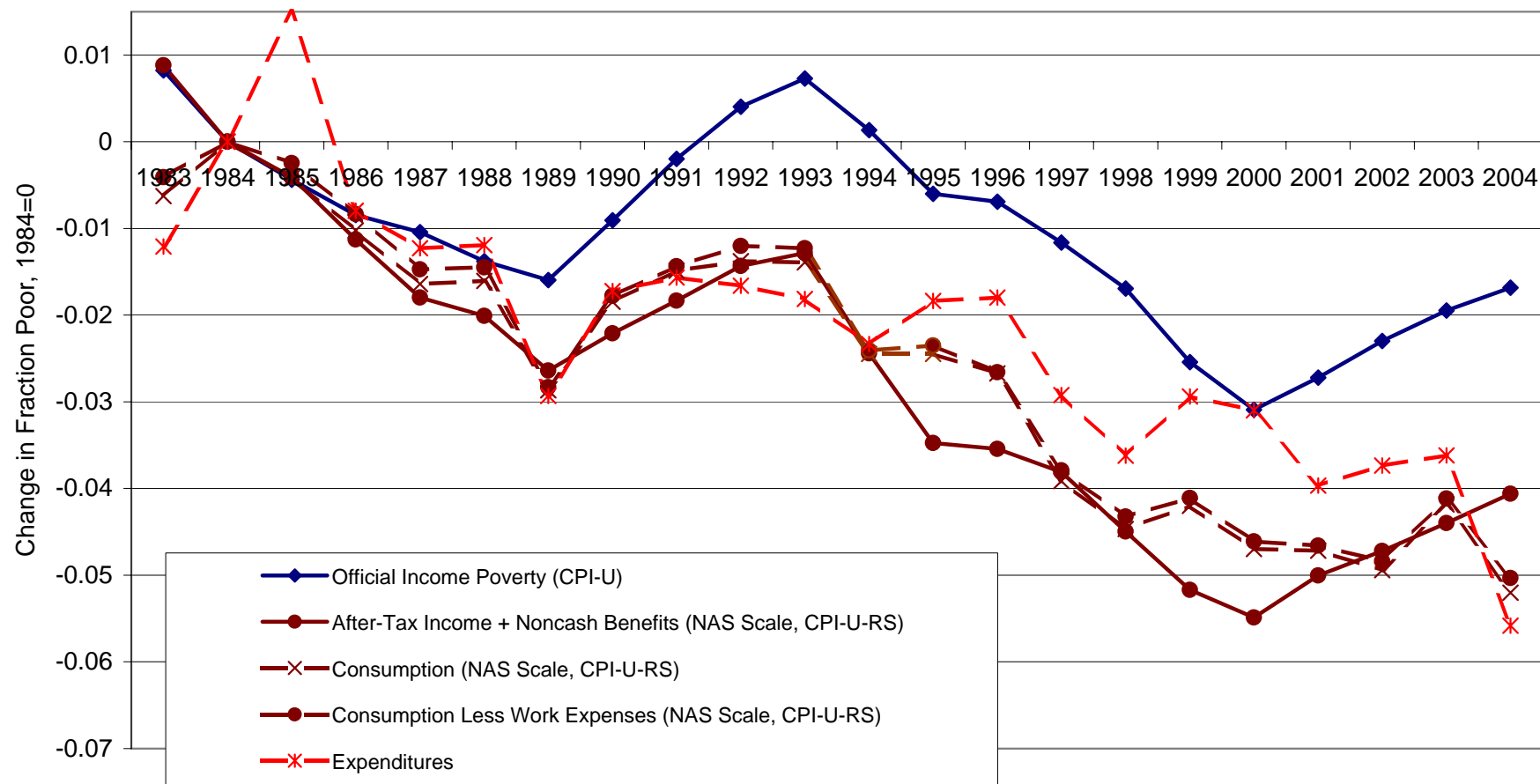
Notes: Prior to 2002 the Annual Social and Economic Supplement (ASEC) to the CPS was called the Annual Demographic File (ADF). All poverty rates are at the person level. Official Income Poverty follows the U.S. Census definition of income poverty using official thresholds. For measures other than the official one, the threshold in 1984 is equal to the value that yields a poverty rate equal to the official poverty rate in 1984 (14.4 percent). The threshold in 1984 is then adjusted overtime using various price indices.

Figure 2: Change in Income Poverty for Different Measures of Income Using NAS Scale and CPI-U-RS, CPS-ASEC/ADF, 1984 = 0



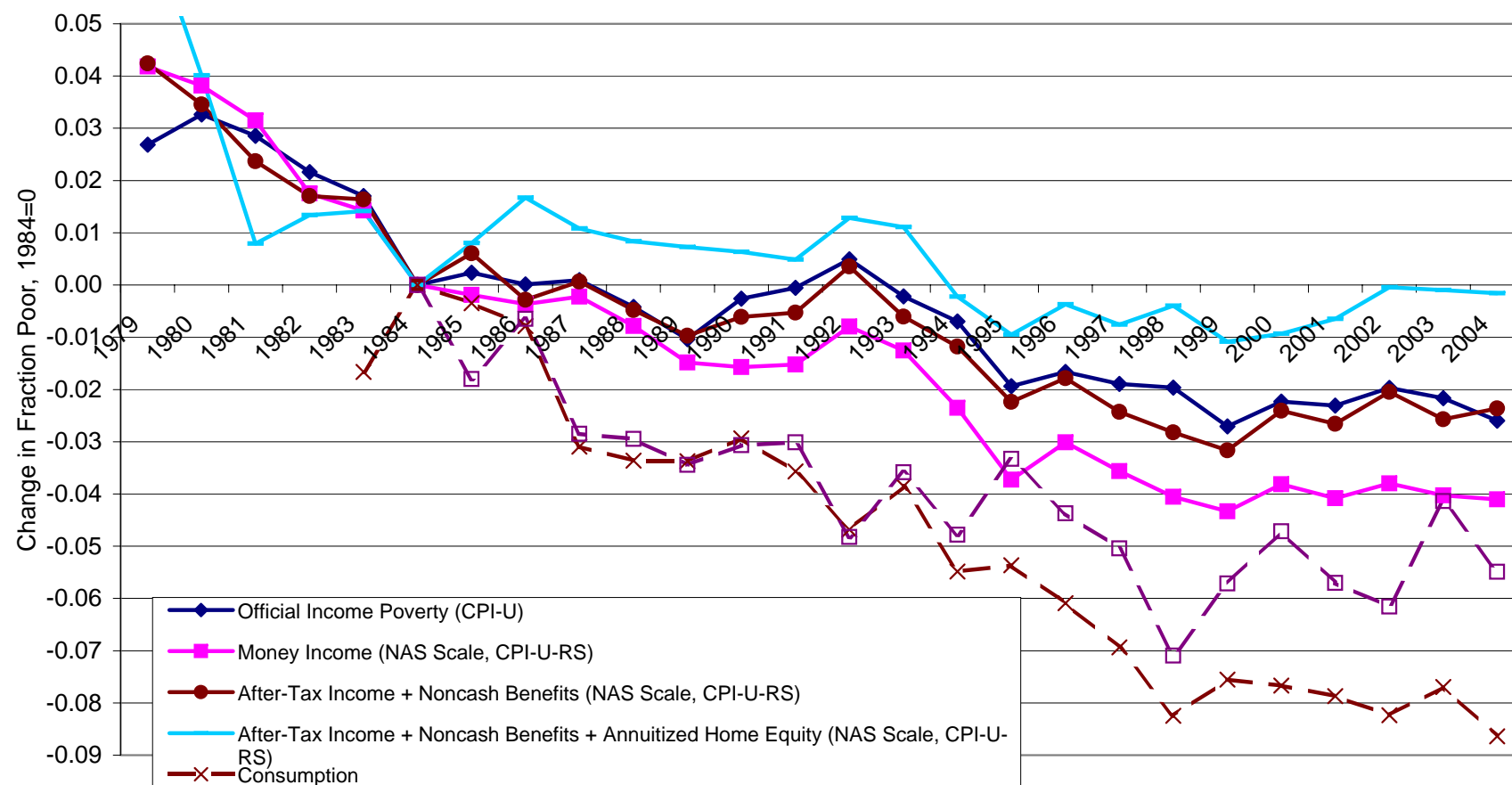
Notes: All poverty rates are at the person level. Official Income Poverty and Money Income are as in Figure 1. For measures other than the official one, the threshold in 1984 is equal to the value that yields a poverty rate equal to the official poverty rate in 1984 (14.4 percent). The threshold in 1984 is then adjusted overtime by the CPI-U-RS. After-tax Money Income includes taxes and credits as well as capital gains and losses. After-tax Income Plus Noncash Benefits also includes Food Stamps, housing and school lunch subsidies, the fungible value of Medicaid and Medicare, and the value of employer health benefits. See Data Appendix for more details.

Figure 3: Change in Consumption and Income Poverty, CPI-U-RS, CE Survey, CPS-ASEC/ADF, 1984 = 0



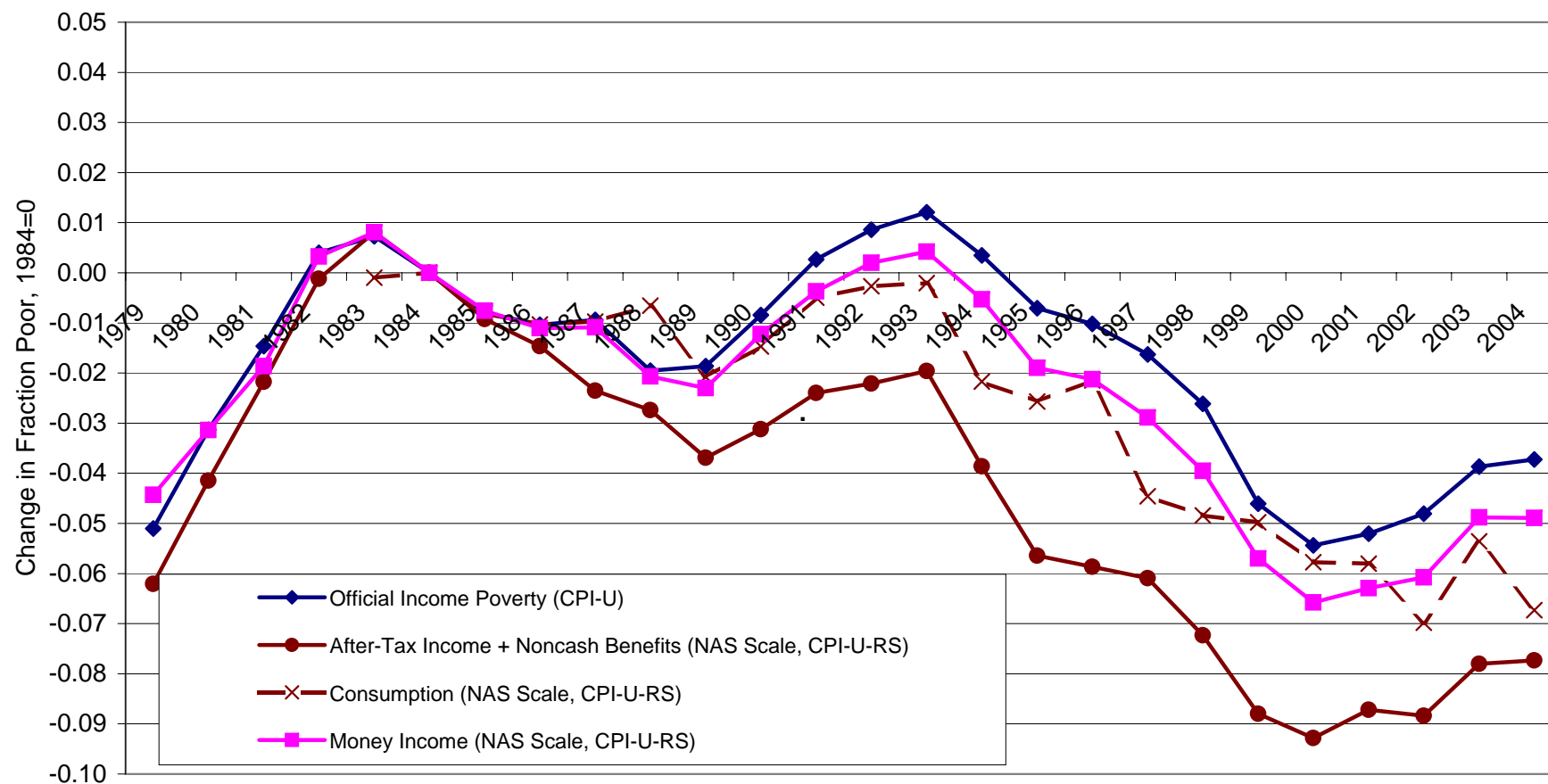
Notes: All poverty rates are at the person level. Official Income Poverty is as in Figure 1. For measures other than the official one, the threshold in 1984 is equal to the value that yields a poverty rate equal to the official poverty rate in 1984 (14.4 percent). The threshold in 1984 is then adjusted overtime by the CPI-U-RS. Work expenses include domestic services and child care. See Figure 2 for additional notes.

Figure 4: Change in Income and Consumption Poverty for Persons 65 and Over, CPS-ASEC/ADF and CE Survey, 1984 = 0



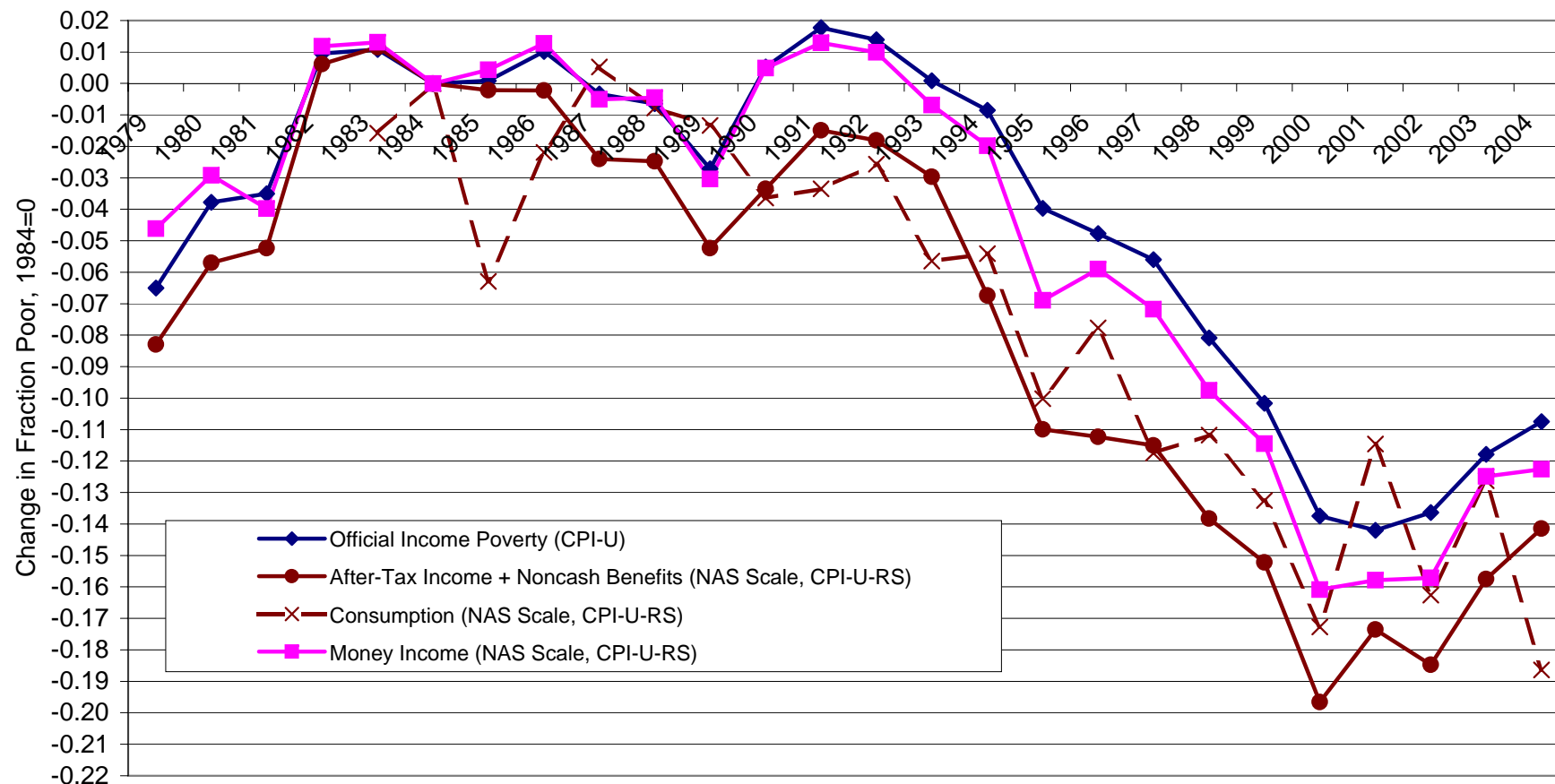
Notes: All poverty rates are at the person level. For each measure, thresholds are the same as those used in Figures 2 and 3. Thus, for this subgroup, the level of poverty in 1984 varies across these measures. For official poverty the 1984 rate is 12.4 percent; for Money Income, 12.9 percent; for After-tax Money Income plus Noncash Benefits, 11.2 percent; for After-tax Income plus Noncash Benefits plus Annuitized Home Equity, 7.7 percent; and for Consumption, 14.3 percent. See Figures 2 and 3 for additional notes.

Figure 5: Change in Income and Consumption Poverty for Children Under 18, CPS-ASEC/ADF and CE Survey, 1984 = 0



Notes: All poverty rates are at the person level. For each measure, thresholds are the same as those used in Figures 2 and 3. Thus, for this subgroup, the level of poverty in 1984 varies across these measures. For official poverty the 1984 rate is 21.5 percent; for Money Income, 21.3 percent; for After-tax Money Income plus Noncash Benefits, 20.9 percent; and for Consumption, 19.9 percent. See Figures 2 and 3 for additional notes.

Figure 6: Change in Income and Consumption Poverty for Single Mothers, CPS-ASEC/ADF and CE Survey, 1984 = 0



Notes: All poverty rates are at the person level. Sample includes families headed by an unmarried female living with her own children only. For each measure, thresholds are the same as those used in Figures 2 and 3. Thus, for this subgroup, the level of poverty in 1984 varies across these measures. For official poverty the 1984 rate is 51.3 percent; for Money Income, 50.1 percent; for After-tax Money Income plus Noncash Benefits, 43.8 percent; and for Consumption, 38.5 percent. See Figures 2 and 3 for additional notes.

Table 1: Comparison of CE Expenditure Measures to National Aggregates, 1984-2004

	1984	1987	1992	1997	2002	2004
Food at home ^a						
CE	205.1	236.4	324.9	376.2	400.2	477.4
PCE	260.6	290.7	366.8	431.3	540.1	603.4
Ratio	0.787	0.813	0.886	0.872	0.741	0.791
Food away from home ^b						
CE	98.9	120.1	136.4	164.9	176.9	217.8
PCE	123.6	154.9	212.3	262.7	339.4	388.2
Ratio	0.801	0.775	0.643	0.628	0.521	0.561
Total food						
CE	304.1	356.4	461.4	541.1	577.1	695.2
PCE	384.2	445.6	579.1	694.0	879.5	991.6
Ratio	0.791	0.800	0.797	0.780	0.656	0.701
Rent plus Utilities ^c						
CE	202.3	235.1	306.7	380.7	401.6	485.1
PCE	209.9	250.0	315.0	387.7	469.6	504.5
Ratio	0.964	0.940	0.974	0.982	0.855	0.961

Notes: PCE numbers come from National Income and Product Account Table 2.5.5: Personal Consumption Expenditures by Type of Expenditure.

^a Food at home is food purchased for off-premise consumption minus alcoholic beverages

^b Food away from home is purchased meals and beverages minus other alcoholic beverages.

^c Rent plus utilities is rent on tenant-occupied nonfarm dwellings plus utilities excluding telephone.

Table 2: Income and Consumption Poverty Rates for 150%, 100% and 50% of NAS Scale-adjusted Threshold, CPI-U-RS, 1979-2004, CPS-ASEC/ADF and CE Survey

year	150 % of Threshold				100 % of Threshold				50 % of Threshold			
	Pre-tax	After-Tax	Consumption	Less Work	Pre-tax	After-Tax	Consumption	Less Work	Pre-tax	After-Tax	Consumption	Less Work
	Money	Income +			Money	Income +			Money	Income +		
	Income	Noncash			Income	Noncash			Income	Noncash		
	CPS	CPS	CE	CE	CPS	CPS	CE	CE	CPS	CPS	CE	CE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1979	0.224	0.252			0.123	0.112			0.039	0.030		
1980	0.240	0.274			0.131	0.125			0.043	0.032		
1981	0.248	0.290			0.138	0.136			0.047	0.035		
1982	0.259	0.296			0.148	0.147			0.054	0.039		
1983	0.262	0.296	0.318	0.317	0.153	0.153	0.138	0.140	0.057	0.041	0.018	0.018
1984	0.248	0.280	0.338	0.341	0.144	0.144	0.144	0.144	0.054	0.037	0.017	0.017
1985	0.243	0.274	0.320	0.323	0.139	0.140	0.140	0.141	0.051	0.036	0.021	0.021
1986	0.232	0.258	0.316	0.322	0.134	0.133	0.134	0.136	0.051	0.036	0.018	0.018
1987	0.225	0.246	0.312	0.318	0.132	0.126	0.128	0.129	0.051	0.034	0.013	0.013
1988	0.222	0.242	0.307	0.312	0.128	0.124	0.128	0.129	0.050	0.034	0.012	0.013
1989	0.219	0.236	0.294	0.297	0.125	0.118	0.115	0.116	0.046	0.032	0.011	0.011
1990	0.224	0.245	0.308	0.312	0.130	0.122	0.126	0.126	0.049	0.032	0.014	0.013
1991	0.232	0.246	0.313	0.317	0.135	0.126	0.129	0.130	0.052	0.035	0.009	0.009
1992	0.239	0.250	0.329	0.334	0.141	0.130	0.130	0.132	0.056	0.038	0.011	0.011
1993	0.243	0.250	0.318	0.321	0.144	0.131	0.130	0.132	0.058	0.039	0.012	0.011
1994	0.233	0.233	0.317	0.324	0.136	0.120	0.120	0.120	0.055	0.036	0.008	0.008
1995	0.224	0.220	0.316	0.320	0.128	0.109	0.119	0.120	0.048	0.033	0.009	0.010
1996	0.221	0.218	0.307	0.310	0.127	0.109	0.117	0.117	0.049	0.031	0.009	0.008
1997	0.213	0.210	0.286	0.289	0.121	0.106	0.105	0.106	0.050	0.034	0.008	0.008
1998	0.201	0.196	0.284	0.290	0.115	0.099	0.099	0.101	0.047	0.033	0.008	0.009
1999	0.194	0.190	0.284	0.288	0.107	0.092	0.102	0.103	0.043	0.032	0.009	0.009
2000	0.188	0.184	0.273	0.279	0.102	0.089	0.097	0.098	0.040	0.031	0.008	0.008
2001	0.194	0.185	0.269	0.274	0.106	0.094	0.097	0.097	0.044	0.034	0.008	0.007
2002	0.200	0.188	0.259	0.263	0.109	0.097	0.092	0.093	0.046	0.036	0.007	0.007
2003	0.203	0.186	0.280	0.285	0.114	0.100	0.100	0.100	0.050	0.039	0.009	0.009
2004	0.203	0.189	0.269	0.276	0.116	0.103	0.092	0.094	0.050	0.039	0.007	0.007
Change												
1984-												
1994	-0.014	-0.047	-0.020	-0.018	-0.007	-0.024	-0.024	-0.024	0.001	-0.002	-0.009	-0.009
Change												
1994-												
2004	-0.030	-0.044	-0.048	-0.048	-0.020	-0.016	-0.028	-0.026	-0.005	0.004	-0.001	-0.001
Change												
1984-												
2004	-0.045	-0.091	-0.068	-0.066	-0.028	-0.041	-0.052	-0.050	-0.003	0.002	-0.011	-0.011

Notes: All poverty rates are at the person level. Thresholds are 150 percent, 100 percent and 50 percent of the thresholds used in Figures 2 and 3. See Figures 2 and 3 for additional notes

Table 3: Poverty Gap per Person in Poverty for Various Income And Consumption Measures, All Persons, 1979-2004, CPS-ASEC/ADF and CE Survey

Resources	Pre-tax Money Income	Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption	Consumption	Consumption Less Work Expenses
Scale	Official	NAS	NAS	Official	NAS	NAS
Price Index	CPI-U	CPI-U-RS	CPI-U-RS	CPI-U	CPI-U-RS	CPI-U-RS
All	(1)	(2)	(3)	(4)	(5)	(6)
1979	2,264	2,158	2,311			
1980	2,320	2,190	2,265			
1981	2,442	2,272	2,301			
1982	2,469	2,308	2,301			
1983	2,466	2,305	2,274	1,468	1,307	1,285
1984	2,455	2,280	2,248	1,461	1,410	1,331
1985	2,488	2,304	2,265	1,546	1,433	1,366
1986	2,542	2,350	2,314	1,410	1,382	1,308
1987	2,557	2,353	2,361	1,352	1,309	1,221
1988	2,552	2,321	2,325	1,335	1,266	1,200
1989	2,521	2,285	2,318	1,350	1,262	1,194
1990	2,537	2,293	2,295	1,463	1,359	1,283
1991	2,593	2,348	2,338	1,284	1,180	1,103
1992	2,669	2,399	2,423	1,347	1,233	1,150
1993	2,737	2,429	2,531	1,343	1,233	1,131
1994	2,726	2,424	2,570	1,293	1,190	1,113
1995	2,694	2,388	2,490	1,276	1,198	1,118
1996	2,709	2,395	2,469	1,278	1,210	1,116
1997	2,850	2,527	2,634	1,372	1,291	1,182
1998	2,880	2,582	2,740	1,352	1,236	1,136
1999	2,911	2,580	2,796	1,401	1,271	1,163
2000	2,934	2,577	2,842	1,344	1,255	1,141
2001	3,044	2,708	2,925	1,357	1,243	1,102
2002	3,051	2,730	2,990	1,403	1,278	1,143
2003	3,128	2,773	3,026	1,417	1,291	1,168
2004	3,123	2,789	3,009	1,374	1,248	1,124
Percent Change 1984-1994	11.01%	6.33%	14.32%	-11.50%	-15.64%	-16.33%
Percent Change 1994-2004	14.59%	15.06%	17.09%	6.21%	4.90%	0.93%
Percent Change 1984-2004	27.21%	22.35%	33.85%	-6.01%	-11.51%	-15.55%

Amounts are in 2004 dollars. The "Official" measures compare income or consumption to official poverty thresholds. The gaps in all other columns are calculated using the same thresholds as in Figures 2 and 3.

Table 4: Poverty Gap per Person in Poverty for Various Income And Consumption Measures, Persons in Families with Heads 65 and Over, 1979-2004, CPS-ASEC/ADF and CE Survey

Resources	Pre-tax Money Income	Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption Official	Consumption NAS	Consumption Less Work Expenses NAS
Scale	Official	NAS	NAS	Official	NAS	NAS
Price Index	CPI-U	CPI-U-RS	CPI-U-RS	CPI-U	CPI-U-RS	CPI-U-RS
Heads 65 & Over	(1)	(2)	(3)	(4)	(5)	(6)
1979	1,961	1,900	2,402			
1980	1,841	1,772	2,282			
1981	1,925	1,779	2,299			
1982	2,057	1,983	2,494			
1983	2,002	1,965	2,433	1,629	1,404	1,367
1984	1,843	1,727	2,221	1,604	1,603	1,463
1985	1,981	1,873	2,282	1,425	1,372	1,291
1986	1,951	1,814	2,306	1,551	1,579	1,491
1987	1,924	1,817	2,292	1,482	1,534	1,428
1988	1,993	1,834	2,304	1,387	1,378	1,315
1989	2,054	1,873	2,365	1,507	1,402	1,324
1990	2,082	1,963	2,364	1,518	1,463	1,339
1991	2,150	1,997	2,411	1,501	1,422	1,262
1992	2,142	2,027	2,450	1,445	1,376	1,299
1993	2,288	2,030	2,551	1,433	1,333	1,219
1994	2,389	2,241	2,703	1,426	1,348	1,234
1995	2,286	2,109	2,498	1,296	1,332	1,138
1996	2,321	2,097	2,528	1,200	1,273	1,083
1997	2,301	2,110	2,588	1,379	1,379	1,177
1998	2,347	2,337	2,827	1,428	1,527	1,296
1999	2,379	2,192	2,610	1,399	1,435	1,213
2000	2,396	2,192	2,658	1,313	1,406	1,169
2001	2,380	2,198	2,656	1,342	1,423	1,091
2002	2,301	2,205	2,608	1,367	1,483	1,250
2003	2,513	2,433	2,825	1,360	1,342	1,198
2004	2,674	2,561	2,951	1,309	1,476	1,198
Percent Change 1984-1994	29.65%	29.74%	21.71%	-11.06%	-15.90%	-15.62%
Percent Change 1994-2004	11.92%	14.30%	9.18%	-8.27%	9.44%	-2.99%
Percent Change 1984-2004	45.11%	48.29%	32.89%	-18.42%	-7.96%	-18.15%

Amounts are in 2004 dollars. The "Official" measures compare income or consumption to official poverty thresholds. The gaps in all other columns are calculated using the same thresholds as in Figures 2 and 3.

Table 5: Poverty Gap per Person in Poverty for Various Income And Consumption Measures, Single Mothers, 1979-2004, CPS-ASEC/ADF and CE Survey

Resources	Pre-tax Money Income	Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption	Consumption	Consumption Less Work Expenses
Scale	Official	NAS	NAS	Official	NAS	NAS
Price Index	CPI-U	CPI-U-RS	CPI-U-RS	CPI-U	CPI-U-RS	CPI-U-RS
Lone Single Mothers	(1)	(2)	(3)	(4)	(5)	(6)
1979	1,997	1,950	1,817			
1980	2,117	2,017	1,764			
1981	2,251	2,139	1,855			
1982	2,364	2,208	1,808			
1983	2,390	2,276	1,918	1,527	1,344	1,363
1984	2,342	2,236	1,830	1,365	1,394	1,251
1985	2,364	2,229	1,792	1,328	1,302	1,193
1986	2,397	2,254	1,818	1,389	1,434	1,288
1987	2,421	2,284	1,823	1,369	1,421	1,214
1988	2,474	2,300	1,894	1,402	1,382	1,258
1989	2,477	2,308	1,959	1,428	1,408	1,272
1990	2,443	2,231	1,754	1,422	1,395	1,237
1991	2,495	2,281	1,751	1,250	1,204	1,069
1992	2,621	2,373	1,870	1,415	1,409	1,229
1993	2,580	2,327	1,771	1,370	1,453	1,185
1994	2,520	2,272	1,820	1,314	1,267	1,122
1995	2,405	2,231	1,692	1,241	1,235	1,094
1996	2,512	2,236	1,739	1,278	1,263	1,067
1997	2,522	2,270	1,813	1,245	1,256	1,044
1998	2,503	2,246	1,801	1,320	1,271	1,110
1999	2,535	2,259	1,921	1,264	1,158	1,055
2000	2,322	2,110	1,831	1,143	1,228	980
2001	2,641	2,422	2,123	1,199	1,191	957
2002	2,527	2,314	2,022	1,209	1,183	898
2003	2,558	2,245	1,968	1,270	1,288	1,013
2004	2,688	2,439	2,096	1,132	1,166	946
Percent Change 1984-1994	7.60%	1.65%	-0.57%	-3.77%	-9.07%	-10.29%
Percent Change 1994-2004	6.66%	7.35%	15.21%	-13.85%	-8.02%	-15.68%
Percent Change 1984-2004	14.76%	9.12%	14.55%	-17.09%	-16.37%	-24.36%

Amounts are in 2004 dollars. The "Official" measures compare income or consumption to official poverty thresholds. The gaps in all other columns are calculated using the same thresholds as in Figures 2 and 3.

Table 6: Demographic Characteristics of the Consumption and Income Poor, 1980-2004, CPS-ASEC/ADF and CE Survey

Sample	1980-1989					1990-1999					2000-2004				
	All	All	Poor	Poor	Poor	All	All	Poor	Poor	Poor	All	All	Poor	Poor	Poor
	CPS	CE Survey	CPS	CPS	CE Survey	CPS	CE Survey	CPS	CPS	CE Survey	CPS	CE Survey	CPS	CPS	CE Survey
Resources Used to Define Poverty			Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption			Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption			Pre-tax Money Income	After-Tax Income + Noncash Benefits	Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Age															
0-17	0.267	0.273	0.396	0.382	0.390	0.265	0.272	0.397	0.374	0.405	0.255	0.261	0.358	0.327	0.375
18-64	0.617	0.609	0.494	0.515	0.493	0.615	0.606	0.504	0.524	0.504	0.624	0.620	0.541	0.564	0.548
65+	0.116	0.118	0.110	0.103	0.116	0.120	0.122	0.099	0.101	0.091	0.120	0.119	0.101	0.109	0.077
Race															
White, Non Hispanic	0.778	0.778	0.532	0.557	0.467	0.729	0.738	0.471	0.485	0.423	0.684	0.697	0.456	0.466	0.392
Black, Non Hispanic	0.119	0.120	0.282	0.258	0.322	0.125	0.123	0.266	0.253	0.293	0.122	0.125	0.238	0.229	0.260
Other	0.103	0.103	0.186	0.184	0.211	0.147	0.139	0.263	0.262	0.284	0.194	0.179	0.306	0.305	0.347
Region															
Northeast	0.210	0.223	0.175	0.159	0.184	0.196	0.203	0.176	0.166	0.160	0.188	0.185	0.170	0.163	0.144
Midwest	0.249	0.253	0.232	0.229	0.240	0.235	0.235	0.201	0.198	0.208	0.226	0.226	0.193	0.190	0.187
South	0.340	0.317	0.404	0.424	0.413	0.348	0.336	0.390	0.404	0.407	0.357	0.360	0.403	0.416	0.454
West	0.201	0.207	0.189	0.187	0.162	0.221	0.226	0.233	0.232	0.225	0.229	0.229	0.234	0.231	0.215
Family Type															
Lone Single Mothers	0.061	0.060	0.222	0.189	0.173	0.062	0.067	0.219	0.196	0.177	0.058	0.060	0.185	0.160	0.146
Married Parents	0.704	0.713	0.384	0.443	0.493	0.664	0.674	0.334	0.357	0.479	0.645	0.655	0.320	0.330	0.461
Single Individuals	0.105	0.106	0.148	0.127	0.107	0.115	0.113	0.151	0.141	0.094	0.125	0.118	0.179	0.170	0.107
Other	0.131	0.121	0.246	0.241	0.226	0.159	0.146	0.296	0.305	0.250	0.172	0.167	0.316	0.340	0.287
N ('000s)	1,600	165.2	227.3	221.7	18.0	1,427	219.9	202.6	168.1	20.2	983.9	151.4	119.2	93.8	11.6

Notes: All poverty rates are determined at the person level. For columns 3, 8, and 13 the official definition of poverty is used. The other income and consumption poverty definitions are calculated using the NAS scale and the CPI-U-RS as explained in the notes to Figure 3. Columns 2 and 5 only include data from the CE Survey from 1983-1989.