

**Who is Poor, How Poverty has Changed, and Why it Matters:  
Poverty Measurement in the U.S. and its Implications for Policy\***

September 30, 2022

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**ABSTRACT**

This paper discusses the key issues in the U.S. poverty measurement debate and the implications of these issues for our understanding of who is poor and how poverty has changed over time. Particular emphasis is given to data quality issues concerning how income or consumption should be measured—an issue that has received less attention in the literature, but has important implications for poverty trends. We then discuss the empirical evidence on how well different poverty measures identify the poor at a point in time, and how well they track changes in poverty over time. The paper highlights several key points. First, at a point in time, how resources are measured has a significant impact on the composition of the poor. In particular, the consumption poor are a much more disadvantaged group than the income poor. Second, how one measures poverty has a large effect on the long-run trends. While the official poverty rate has not declined (it is was higher as recently as 2015 than in 1980), the evidence of a long-run decline in poverty is clear in both income- and consumption-based measures of poverty that address some of the well-known flaws in the official measure. The most important factors that affect trends in poverty are how resources are defined (i.e. pre-tax income, disposable income, consumption, etc.), how income is measured (whether administrative data are incorporated), and how thresholds are adjusted over time for inflation. Third, there is considerable evidence that important sources of income for the poor are significantly under-reported in surveys. The problem is particularly severe for those with extremely low reported income. This evidence makes a strong case for consumption being a more accurate measure of economic well-being for those with few resources than reported income. The evidence also points to the value of improved income measures relying on surveys linked to administrative data. Finally, poverty has been sharply reduced through tax rate cuts and tax credits and expansions in social security.

\* We would like to thank Mandana Malgorzata Vakil for helpful comments. We also thank the Russell Sage, Alfred P. Sloan, and Charles Koch, and Menard Family Foundations for their support. Han: School of Economics, Zhejiang University, Yuhangtang Road No.866, Hangzhou, 310058 China [jeehoonhan3@gmail.com](mailto:jeehoonhan3@gmail.com)  
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## I. Introduction

Few economic indicators are more closely watched or more important for policy than the official poverty rate. Poverty is used to gauge the extent of deprivation in the U.S. and to determine how economic well-being has changed over time. The poverty rate is often cited by policy makers, researchers, and advocates who are evaluating social programs that account for more than three-quarters of a trillion dollars in government spending.<sup>1</sup> Eligibility for some of these means-tested transfer programs is determined based on poverty thresholds, and local poverty rates affect the allocation of billions of dollars in federal funds.

This paper discusses the key issues in the U.S. poverty measurement debate and the implications of these issues for our understanding of who is poor and how poverty has changed over time in the United States. We focus on poverty measurement in the U.S., but most of the issues are more general. At times we rely on lessons from other countries, but we do not contend that all of the U.S. lessons apply elsewhere, though undoubtedly many of them do. We discuss the origins of the official poverty measure in the U.S. The methods for calculating this measure, largely unchanged since the 1960s, have been criticized by many researchers. We highlight the key decisions that go into constructing a poverty measure and then present empirical evidence on how these decisions affect the composition of poverty and its trends. Particular emphasis is given to how income or consumption should be measured and data quality—an issue that has received less attention in the literature, but has important implications for poverty trends.

The paper highlights several key points. First, at a point in time, how resources are measured has a significant impact on the composition of the poor. In particular, the consumption poor are a much more disadvantaged group than the income poor, even when the measure of income is expanded to include taxes and in-kind benefits. Second, how one measures poverty has a large effect on the long-run trends. While the official poverty rate has not declined (it is was higher as recently as 2016 than in 1970), the evidence of a long-run decline in poverty is clear in other measures that address some of the well-known flaws in the official measure. The most important factors that affect trends in poverty are how resources are defined (i.e. pre-tax income, disposable income, consumption, etc.), how income is measured (whether administrative data is used to replace badly reported income components), and how thresholds are adjusted over time for inflation. While the long-run trends for consumption poverty are fairly similar to those for a disposable income poverty measure, there are substantive differences. In particular, consumption-based poverty fell more noticeably over the past two decades than did income-based poverty. Between 2000 and 2020, consumption-based poverty fell by 2.9 percentage points more than income poverty, a difference of nearly 10 million individuals. We also show that consumption deep poverty falls more noticeably than income deep poverty. Correcting for well-known biases in the price index used to adjust thresholds over time also has a significant effect on overall changes. A poverty measure that accounts for the magnitude of the bias suggested by the recent literature falls by 6.9 percentage points more than a measure that relies on the CPI-U, the index that is used to adjust the official thresholds.

Third, there is considerable evidence that important sources of income for the poor are significantly under-reported in surveys. The problem is particularly bad for those with extremely

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<sup>1</sup> <https://www.cbo.gov/system/files/2019-06/55347-MeansTested.pdf>

low reported income. Recent evidence on the quality of consumption data; the fact that consumption exceeds income for those at the bottom; and that low-consumption is a much better predictor of deprivation make a strong case for consumption being a more accurate measure of economic well-being for those with few resources. Finally, some government programs have contributed to the sharp decline in poverty over the past four decades. For example, accounting for taxes and tax credits—in particular, expansions in the EITC—led to a 5.7 percentage point greater decline in poverty, and expansions in social security have resulted in a 6.3 percentage point greater decline. There is limited evidence of an impact of other cash or noncash programs, but this may be due to the fact that these programs are significantly under-reported in surveys and the under-reporting has increased over time.

## **II. Goals of poverty measures**

Typically, poverty measures are designed to achieve one or more of the following goals: 1) identify the individuals and subgroups of the populations that are the most disadvantaged, 2) determine how the level and extent of deprivation has changed over time to assess how macroeconomic and broad social changes affect those with few resources and the need for transfer programs, 3) assess the impact that public policies and broad social and economic trends have on deprivation both at a point in time and over time, 4) target transfers to individuals, groups or areas most in need, 5) provide a benchmark for eligibility for means-tested programs, and 6) determine program eligibility for specific individuals. The appropriateness of a poverty measure will differ depending on the goal. For example, the appropriate design of a poverty measure intended to aid the targeting of benefits will depend on the situation of the target group, such as whether the benefits are for temporary or chronic deprivation? In this paper, we will focus on the first three goals. This focus accords very closely with the goals stated in the National Academy of Sciences report *Measuring Poverty*.<sup>2</sup> For the last three goals, a different set of criteria are crucial for assessing the appropriateness of the measure such as immediate availability for program eligibility and fine geographic detail for allocation of funding. Thus, the measures most suited to these other purposes may be different from those on which we focus here. We should also note that there are other conceptions of poverty in the social sciences that highlight opportunities available to individuals rather than outcomes per se.

## **III. Basics of poverty measurement**

In this section, we discuss the common components and various decisions that go into constructing a poverty measure. We will also discuss the origins of the official measure of poverty in the U.S. and how it is constructed and describe alternative approaches to income-based poverty measurement that have been implemented.

### **A. Single dimensional versus multiple dimensional poverty measures**

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<sup>2</sup> “The panel proposes a new measure that will more accurately identify the poor population today...Equally important, the proposed measure will more accurately describe changes in the extent of poverty over time that result from new public policies and further social and economic change.” (Citro and Michael 1995, pp. 1-2). For similar language see p.1 of Ruggles (1990) or p. 5 of Interagency Technical Working Group (2021).

Most poverty measures reflect a single dimension of well-being such as income or consumption. An attraction of such measures is that they are simple to understand and provide summary information in a single statistic. A different approach that has been used, mostly in developing countries and in Europe, is to examine multiple measures that capture different dimensions of well-being. A version of this line of work looks at “social inclusion” (Atkinson et al. 2002), which, in practice, is taken to include material well-being, education, health, housing, labor market outcomes, and the ability to participate in society. An even broader set of measures is argued for in Stiglitz, Sen, and Fitoussi (2009), which includes social connections and relationships, the environment, and physical and economic insecurity. The Global Multidimensional Poverty Index (MPI) developed by the Oxford Poverty and Human Development Initiative (OPHI) and released by the United Nations Development Program (UNDP) in the Human Development Report since 2010 uses ten indicators to measure three dimensions of poverty at the individual level: education, health, and material living standards.

Following this trend, in October 2018, the World Bank presented its own multidimensional poverty measure (World Bank 2018). The World Bank’s Atkinson Commission Report “Monitoring Global Poverty” (World Bank 2017) advised using a six-dimensional measure of overlapping deprivations. The report advised that this measure should cover health, nutrition, education, work, living standards, and violence.

Multidimensional poverty indices have also been developed by many countries as official national poverty statistics. Some work has been done to develop these types of measures for the U.S., including two 2019 reports using ACS data, one from the Census Bureau (Glassman 2019) and a paper by Dhongde and Haveman (2019). Indicators used in these studies include income poverty status, incompleteness of high school education, lack of health insurance, number of disabilities experienced by an individual, overcrowding, housing costs, English fluency, and neighborhood characteristics, but there are important differences in the specific dimensions selected and the definition of deprivation for each dimension across studies. For example, Glassman includes official poverty status and neighborhood characteristics as dimensions while Dhongde and Haveman do not. On the other hand, Dhongde and Haveman examine English fluency while Glassman does not. While these multi-dimensional approaches offer many advantages, this paper will concentrate on single dimensional measures given their prevalence in the U.S.

## **B. The components of a single-dimensional poverty measure**

There are many components to a single-dimensional poverty measure and the structure of these components can affect who within the population is specified as poor, the fraction of the population that is designated as poor, and how this poverty rate changes over time. We discuss how these different components affect the composition of poverty and changes in poverty over time in Sections VI and VII. In this subsection, we briefly explain the main components.

- 1) *Resources*: A key component of a typical single-dimensional poverty measure is the definition of resources. Specifying resources entails answers to a number of questions:

- a. What is included in resources? Typically, resources are measured using income or consumption, but there is much discussion in the literature as to how to define income and consumption.
  - b. Over what time period are resources measured? Many poverty measures consider resources over the course of a year, although both shorter and longer time periods have been proposed.
  - c. Who is included in the resources sharing unit? Often the resource sharing unit includes all related members of a family, but other approaches include unrelated cohabitators in the family unit or define the sharing unit based on who within a household shares resources.
- 2) *Thresholds*: To determine poverty, single-dimensional measures compare resources to a specified threshold. Four key questions must be answered to determine poverty thresholds:
- a. Where to draw the line? Thresholds can be set as an absolute level of resources or relative to some standard, such as the median level of income. For example, the European Union focuses on a measure of poverty defined as the fraction below 60 percent of median income. The value of the poverty cutoff can have a large effect on the estimated poverty rate, but its precise location is inherently arbitrary.
  - b. How should the cutoff be adjusted over time to account for inflation?
  - c. How should the cutoff be adjusted across families of different sizes to account for economies of scale in consumption?
  - d. Should the cutoff be adjusted across geographic areas to account for regional price differences, and if so, how?
- 3) *Poverty indicator vs. poverty intensity*: Most poverty measures rely on indicators specifying whether an individual's resource sharing unit's resources fall above or below a specified threshold, also called a head count measure. Alternatively, a measure could capture how far resources fall below the threshold, as is done by a poverty gap measure.

### C. The Official Poverty Measure and Its Origins

The first major federal effort to measure poverty in the United States was set in motion by President Lyndon Johnson's declaration of a "War on Poverty" in his State of the Union address to Congress in 1964.<sup>3</sup> The Council of Economic Advisers' (CEA) 1964 Economic Report of the President set the terms for President Johnson's war. The chapter of the report on poverty was written by Robert Lampman who was the lead economist on poverty measurement at the CEA and was a key intellectual force behind early poverty measurement (also see his book, Lampman (1971). The chapter discussed poverty as a head count measure with an absolute standard based on pre-tax money income with thresholds that were updated for inflation each year.<sup>4</sup> The 20 percent baseline was achieved by setting the threshold for families at \$3,000 regardless of family size and for single adults at \$1,500. In mentioning these thresholds, the report refers to a study from the Social Security Administration (SSA) that defined an "economy plan" budget for a nonfarm family of four as \$3,165 in 1962 prices. Thus, the choice of our poverty thresholds is often recounted as having been determined by the cost of a single food plan. In fact, those involved in the decision have reported that the overall rate was set, and the food plan was chosen

<sup>3</sup> <https://millercenter.org/the-presidency/presidential-speeches/january-8-1964-state-union>

<sup>4</sup> <https://fraser.stlouisfed.org/title/economic-report-president-45/1964-8135>

to arrive at that rate (Fisher, 2008). Burkhauser et al. (2021) argue that the 20 percent baseline poverty rate was a political decision by Present Johnson and his administration. The frequent recounting suggests a desire to make a political choice that was fundamentally arbitrary seem more natural.

Later work by Mollie Orshansky of the Social Security Administration (SSA) in 1965 defined resources similarly, but set thresholds differently.<sup>5</sup> The SSA approach provided two sets of thresholds at three times the cost of either the economy food plan or the low-cost food plan for families of different sizes and composition as determined by the U.S. Department of Agriculture (USDA). Thus, the two different food plans produced two different poverty rates. The multiplier of three reflected a 1955 survey finding that food expenditures represented about a third of spending for the average family. Variation in the cost of the plan by family size and composition provided an implicit adjustment for the number and ages of family members that accounted for different food consumption across these families.

A series of reports by the Census Bureau then followed, each producing different versions of these poverty measures. The reports were informed by the decisions of an interagency group involving the Bureau of the Budget (what is now the Office of Management and Budget), CEA, SSA, and other agencies regarding key elements of the poverty measure. The culmination of this process was an official notice by the Bureau of the Budget in 1969 that created the Official Poverty Measure (OPM). This notice, later formalized as Statistical Policy Directive 14, required all agencies to adopt the poverty measure as defined in the latest Census Bureau report that reflected the interagency group's decisions.<sup>6</sup> The OPM thresholds would be set based on the (lower-cost) economy food plan, and would be updated with inflation each year.<sup>7</sup> Fisher (2008) argues that the economy food plan based thresholds were chosen because they produced an initial poverty rate of approximately 20 percent in 1963, the baseline published by CEA in 1964 used for President Johnson's War on Poverty.<sup>8</sup> Thus, the decisions about the baseline poverty rate and whether to adopt an absolute poverty standard were in effect determined by President Johnson and his CEA, while the equivalence scale (how thresholds vary across families of different sizes) was determined by the SSA approach.

To calculate official poverty each year, the Census Bureau relies on data on pre-tax money income from the Current Population Survey Annual Social and Economic Supplement, a survey of about 75,000 households. If a family has income below the poverty threshold for that size family, all family members are classified as poor. In 2021, the official poverty threshold for a two-adult, two-child family was \$27,479. In terms of the components of a poverty measure laid out above, the resources are pre-tax money income, the time period is one year, and the resource sharing unit is those related by blood or marriage. The original equivalence scale, developed by Mollie Orshansky as mentioned above, were based on the cost of the US Department of Agriculture's Economy Food Plan. Except for a few minor changes, the only adjustment to these thresholds over the past five decades has been for inflation using the Consumer Price Index for

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<sup>5</sup> <https://www.ssa.gov/policy/docs/ssb/v28n1/v28n1p3.pdf>

<sup>6</sup> Bureau of the Budget, Office of Statistical Policy, *Definition of Poverty for Statistical Purposes*, Statistical Reporter, Washington, DC, September 1969, p. 37, and *ibid*, *Revision of the Poverty Definition*, p. 39.

<sup>7</sup> Bureau of the Budget, Office of Statistical Policy, *Definition of Poverty for Statistical Purposes*, Statistical Reporter, Washington, DC, September 1969, p. 37, and *ibid*, *Revision of the Poverty Definition*, p. 39.

<sup>8</sup> <https://heinonline.org/HOL/LandingPage?handle=hein.journals/ssbul68&div=22&id=&page=>

all Urban Consumers (CPI-U).<sup>9</sup> There is no geographic adjustment. For a more detailed summary see Citro and Michael (1995), Blank (2008), and Blank and Greenberg (2008).

#### **IV. Limitations to the Official Poverty Measure and Alternative Approaches**

Since the design of the official measure fifty years ago, all of its components from its designation of resources to how it adjusts for family size have been called into question. In the 1980s, the Census Bureau published a series of experimental poverty measures that sought to make improvements on the OPM. These experimental measures focused on improvements in the resource measure by adjusting for taxes, including in-kind transfers, and experimenting with various approaches for including a value of health insurance. Besides the Census Bureau, outside researchers provided many suggested changes to the official measure. The influential monograph by Ruggles (1990) proposed updating the overall level of the thresholds, changing the equivalence scale, moving to an after-tax income measure and incorporating “cashlike” in-kind benefits.

Then in 1995, a National Academies of Sciences (NAS) panel published a volume entitled, *Measuring Poverty*, which proposed the creation of a new poverty measure.<sup>10</sup> The report recommended the adoption of a “quasi-relative” standard for adjusting thresholds, which would neither be updated with inflation (an absolute standard) nor increased proportionally with median resources (a relative standard) each year. Instead, thresholds would be tied to spending on a certain set of goods – food, clothing, shelter and utilities – purchased by families with moderate levels of spending on these goods. The resource measure would adjust for taxes, include in-kind transfers except health insurance, and would adjust resources based on certain expenditures such as medical out-of-pocket spending and child care costs.

An interagency technical working group in 2010 published a short report that largely adopted the recommendations of the 1995 NAS report, which set in motion the development of the Supplemental Poverty Measure (SPM) by the Census Bureau. The SPM was first published by the Census Bureau in 2011. It was not intended to replace the OPM or be used for determining eligibility for government programs. Instead, it was intended to be published in addition to the OPM as an experimental measure that would continually be improved. In this light, an SPM technical working group was formed in 2016 to recommend improvements.

The SPM has two main features. First, it includes in resources estimates of in-kind benefits, while subtracting estimated taxes and reported medical out-of-pocket expenditures and child care. Second, it sets the poverty thresholds as 1.2 times average spending on food, clothing, shelter, and utilities (FCSU) among households with exactly two children and any number of adults that are between the 30th and 36th percentiles of spending on those goods. Scaling up by 1.2 is meant to account for “additional basic needs”. Separate poverty thresholds are calculated for three different housing status groups: renters, homeowners with a mortgage, and homeowners

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<sup>9</sup> Between 1969 and 1979 the thresholds were adjusted using the All-items Consumer Price Index (CPI-W). Since then, the thresholds have been adjusted using the CPI-U (ITWG-CIM, 2021). The original thresholds varied by sex of the head, whether the head is under 65, family size, number of children, and whether the residence is a farm. Since 1981 the thresholds have varied by whether the head is under 65, family size, and number of children (<https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>).

<sup>10</sup> <https://www.nap.edu/catalog/4759/measuring-poverty-a-new-approach>

without a mortgage (those in public housing are included in this last group) based on the FCSU spending of consumer units of the size mentioned above in the 30<sup>th</sup> to 36<sup>th</sup> percentiles of FCSU spending within those groups.

In 2019, a new interagency group was formed that took a comprehensive view of the latest research on poverty measurement and recommended new alternative poverty measures in addition to the SPM. The Interagency Technical Working Group on Evaluating Alternative Measures of Poverty (ITWG-EAMP), which included members from 11 federal agencies, published its consensus final report in January 2021. The report assembled the evidence on poverty measurement developed in the more than 25 years since the 1995 NAS panel, and made 36 recommendations for the development of two new sets of poverty measures to be published alongside the OPM and SPM. One set of poverty measures would be based on income, combining survey data with administrative data, and another set of measures would be based on consumption (ITWG-EAMP 2021). These recommendations were largely motivated by the extent of errors in reporting and imputing components of income in surveys and the conceptual advantages of consumption in measuring disadvantage as described in the report.

For the remainder of this section, we discuss the key issues in the debates over how to specify each component of a single dimensional poverty measure. We also explain how the SPM specifies each of these components and highlight some of the pros and cons of the alternative approach in each case.

## **A. Measuring Resources in a Single Dimensional Poverty Measure**

### **A.1 What Resources Should be Included?**

Perhaps the most widely-criticized feature of the official poverty measure is that it defines resources as pre-tax money income, failing to reflect the full resources at a family's disposal. Money income does not subtract tax liabilities (and even low-income workers must pay payroll taxes for Social Security and Medicare), nor does it include the Earned Income Tax Credit and other tax credits or noncash benefits such as food stamps, housing or school lunch subsidies, or public health insurance. Thus, many of the major anti-poverty initiatives of the last few decades are not reflected in the poverty rate, because policies like a rise in the Earned Income Tax Credit, a more generous Child Tax Credit, and expansions of Medicaid and food stamps do not show up as money income.

Several alternative income measures of resources have been proposed that are after tax and include some noncash benefits, including the NAS recommended measure, the SPM resource measure, and those proposed by the ITWG-EAMP. However, conceptual limitations remain and, as we discuss in Section VI, such modifications do not necessarily improve the ability of these alternative income based measures to accurately identify the worst off.

Rather than defining resources based on what is available for consumption, other researchers have argued that one should define resources by measuring consumption directly (Cutler and Katz 1991; Poterba 1991; Slesnick 1993, Meyer and Sullivan 2003, 2011, 2012a). This research has pointed to both conceptual and measurement reasons for favoring consumption. We summarize the conceptual arguments here and discuss measurement issues in Section V.



Conceptual arguments as to whether income or consumption is a better measure of the material well-being for those struggling to meet basic needs almost always favor consumption. Because individuals may save or borrow to smooth over variable income, consumption is more likely to reflect long-run resources. Income-based measures of well-being will not capture differences over time or across households in wealth accumulation or access to credit. Another fundamental problem with income-based poverty measures is that income misses the value of ownership of durable goods such as houses and cars. Someone who owns a home outright receives a flow of services and does not have to pay rent. Income measures also miss some of the indirect benefits of anti-poverty programs. For example, many programs are valuable to households because they act as insurance for when earnings are low. These conceptual limitations have influenced a large literature that looks at consumption-based measures of well-being and discusses their advantages (Cutler and Katz 1991; Poterba 1991; Slesnick 1993, Meyer and Sullivan 2003, 2011, 2012a).

Some researchers have argued that income may have some conceptual advantages over consumption. One reason is that individuals can choose to have low consumption, while income reflects access to resources that can be used for consumption, and as such is not driven by consumption decisions (Atkinson, 1991). However, individual choices affect the level of income as well through education, employment, occupation, and hours worked choices. Furthermore, consumption is more likely than income to be affected by the ability to borrow and by access to public insurance programs. Thus, consumption will do a better job of capturing the effects of changes in access to credit or the government safety net. Another potential advantage to income is that current consumption fails to capture the benefits to donors of leaving bequests. While this is an important concern, the effect of a desire to leave an estate on consumption is likely to be small for the poor.

In their evaluation of poverty measurement, the NAS panel concluded that “On balance, many members of the panel find more compelling the arguments in favor of a consumption definition that attempts to assess actual levels of material well-being” (Citro and Michael 1995, p. 213). The panel’s final recommendation, however, calls for an income based measure because of concerns about adequate consumption data. One important concern is that small samples in current consumption datasets make it difficult to construct poverty statistics at the subnational level, rather than the national statistics we report here. We discuss other concerns regarding data quality below.

One of the most vexing choices facing those designing a poverty measure is how to handle health insurance. The stakes are high because in 2020, national health expenditures were \$4.1 trillion and 20 percent of GDP (CMS 2022). Despite the large and increasing amount of resources spent on health insurance, the value of employer and government provided health insurance is not captured in the OPM. It is also not captured in the SPM, except to the extent that health insurance changes out-of-pocket expenses on health care and health insurance premiums. Measures of poverty or the income distribution incorporating health insurance have been produced by the Census Bureau going back to the 1980s and by many researchers (see ITWG-EAMP 2021, p. 21 for references; the following discussion relies heavily on this report).

One challenge when incorporating health insurance into a poverty measure is determining its value. There is a strong case that such a measure should reflect the ex-ante value of health insurance, or its value prior to knowledge about injury or sickness in a given year. This approach helps to avoid the problem of making the injured and sick or those with greater medical needs look less poor, which is a larger concern with an alternate approach of simply including as a resource all medical spending incurred on behalf of an individual through insurance in a given year. However, even the ex-ante value of health insurance can make individuals with disabilities or longer-term health conditions look less poor since they require more health care and thus typically consume more health insurance. Thus, it may be desirable to ensure health insurance values are not conditioned on disability status or other health conditions.

The ITWG-EAMP considered various approaches for valuing health insurance. The key approaches considered included: (i) using the full market value of health insurance; (ii) using a lower value of health insurance reflecting research that estimates a willingness to pay below 100 percent of its full market value; (iii) using a fungible value of health insurance; and (iv) placing a zero value on health insurance. Each of these measures could be implemented with an exclusion from resources of all or some medical out of pocket spending to reflect that such amounts are not available for non-health consumption. It is worth acknowledging that none of these approaches would perfectly capture the situation of all individuals—it is a question of choosing a strategy that approximates the value of health insurance well for most people.

## **A.2 Unit of time**

Another factor that affects the measure of resources is the time period over which resources are measured. The official poverty measure and the vast majority of single-dimensional poverty measures calculated for the U.S. and elsewhere specify the reference period for resources as one year. There are a number of strong reasons why an annual rate might be appropriate. In particular, income, and to a lesser extent consumption, fluctuates over short time periods for a variety of reasons, but these fluctuations do not necessarily translate into changes in well-being. For example, teachers are often paid on a 9-month basis, which may lead to a sharp decline in income during the summer months that does not reflect a decline in well-being in most cases. There are also reasons one might prefer a different reference period for a poverty measure. Short-term poverty may better reflect the negative effects of high frequency changes in resources, or transitory spells of deprivation. However, short-term income measures will over-state changes in poverty if people are able, to some extent, to smooth consumption as income fluctuates. Other researchers have also pushed for considering long-term measures of poverty, arguing that such measures would be a better indicator of the effect of programs designed to have a permanent impact on economic well-being (Duncan, Smeeding and Rodgers, 1992). There also is substantial evidence that multi-year measures of income are more closely associated with other measures of deprivation and unfavorable outcomes (Brooks-Gunn and Duncan 1997; Duncan et al. 1998; Sullivan et al. 2009). Given their prevalence in the literature, we will focus on annual income poverty rates in our discussions below.

### **A.3 Resource sharing unit**

The official poverty measure treats the resource-sharing unit as those related by family ties; in contrast, the sharing unit in the SPM also includes cohabitators and their children, who are treated in the official measure as a separate family unit within the household even though they live together and may share resources. Ideally, the sharing unit should be, well, those who share resources. Information on resource sharing across cohabitators is not collected in the Current Population Survey, although resources or cost-sharing provided to a family by cohabitators may be substantial. The treatment of cohabitators has become more important in recent years as the fraction of households with cohabitators present has risen.

In surveys such as the Consumer Expenditure Survey that are used to construct consumption measures of poverty, the reference unit includes all those related by blood and marriage as well as cohabitators who share responsibility for housing, food, or other living expenses, but excludes cohabitators who do not contribute to these expenses. This more closely aligns with what is intended to be captured by a poverty measure.

## **B. Specifying Thresholds in a Single Dimensional Poverty Measure**

Four factors go into determining poverty thresholds, or the point in the distribution of resources below which a family or individual is designated as poor: selection of where in the distribution of resources to draw this line; adjustments for changes in the cost of living or changes in the real standard of living over time; adjustments for differences in family size; and whether to adjust for geographical differences in cost of living.

### **B.1 Where to draw the poverty line**

As discussed above, the original official poverty thresholds were set to achieve a given poverty rate, though the chosen rate was subsequently justified by reference to a food plan that was chosen to lead to the rate. Considerable debate has centered on whether these thresholds specify an appropriate cutoff. Alternative measures, such as the SPM, have proposed cutoffs that are typically higher than those in the official measure.<sup>11</sup> Another approach is to specify the thresholds as a given percentage of median income or consumption. For example, the European Union sets the cutoff at 60 percent of median income. These are called relative poverty measures because the minimum standard of living is designated as a value relative to another point in the distribution, and therefore the standard changes over time in real terms.

The intention of the SPM and relative poverty measures, as in Orshansky (1965), is to tie the location of the cutoff to some notion of minimum sufficient needs of a family. While there is a scientific basis for some aspects of poverty measurement, the selection of a poverty cutoff is

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<sup>11</sup> The official threshold for a family with two adults and two children in 2021 is \$27,479. The SPM threshold in 2021 for this family type that owns a home with a mortgage (\$31,107) or rents (\$31,453) is higher than the official cutoff, but the SPM threshold for this family type that owns a home without a mortgage (\$26,279) is lower than the official cutoff ([www.bls.gov/pir/spm/spm\\_thresholds\\_2021.htm#:~:text=As%20seen%20in%20Chart%201,for%20two%20adults%20two%20children](http://www.bls.gov/pir/spm/spm_thresholds_2021.htm#:~:text=As%20seen%20in%20Chart%201,for%20two%20adults%20two%20children)).

inherently arbitrary. Well-being is likely to vary continuously with the level of income or consumption, and research has not shown a sharp change in outcomes near the poverty line.

While the arbitrariness of poverty thresholds was emphasized by the authors of the 1964 Economic Report of the President, Molly Orshanky, and Patricia Ruggles, Ivan Fellegi, the long-time Chief Statistician of Canada summarized the issues well:

Both [absolute and relative] approaches involve judgmental and, hence, ultimately arbitrary choices.

In the case of the relative approach, the fundamental decision is what fraction of the overall average or median income constitutes poverty. Is it one-half, one-third, or some other proportion? In the case of the absolute approach, the number of individual judgements required to arrive at a poverty line is far larger. Before anyone can calculate the minimum income needed to purchase the "necessities" of life, they must decide what constitutes a "necessity" in food, clothing, shelter and a multitude of other purchases, from transportation to reading material.

The underlying difficulty is due to the fact that poverty is intrinsically a question of social consensus, at a given point in time and in the context of a given country. Someone acceptably well off in terms of the standards in a developing country might well be considered desperately poor in Canada. And even within the same country, the outlook changes over time. A standard of living considered as acceptable in the previous century might well be viewed with abhorrence today.

It is through the political process that democratic societies achieve social consensus in domains that are intrinsically judgmental. The exercise of such value judgements is certainly not the proper role of Canada's national statistical agency which prides itself on its objectivity, and whose credibility depends on the exercise of that objectivity (Fellegi, 1997).

Having an arbitrary cutoff is a feature, not just of the SPM, but of virtually all poverty indicators. There are valid arguments for why new thresholds should be greater in real terms than those specified in the 1960s, particularly if individual well-being is affected by the affluence of others. Median income and consumption have risen considerably over the past forty years. However, how much thresholds are adjusted up in real terms is a value judgment. That the poverty rate for an alternative measure exceeds or is lower than the official rate at a point in time is a consequence of subjective or political decisions, not scientific ones.

## **B.2 Adjusting thresholds over time**

An important purpose of a poverty measure is that it serves as a key social indicator of the extent of deprivation and how it has changed over time. Since the purchasing power of a dollar changes with time, some adjustment must be made for inflation. Some poverty measures would also make additional adjustments.

### *Changes in absolute vs. relative poverty*

How one adjusts thresholds over time differs between absolute and relative poverty measures. With an absolute poverty measure the thresholds are adjusted for inflation, so that the real value of the thresholds remains unchanged over time. With a relative poverty measure the real value of the thresholds can rise or fall over time. An absolute measure of poverty is particularly useful for understanding changes in the material circumstances of the population or for evaluating policy changes that aim to reduce the number of people with very few resources. However, an important concern with an absolute measure is that societal views on what it means to be poor change, particularly over long periods. Goods that are viewed as luxuries for one generation (such as televisions or cars) may be viewed as necessities by future generations. Even those involved in President Johnson's War on Poverty, who advocated for an absolute measure of poverty, acknowledged that anti-poverty goals should be updated, albeit infrequently, to reflect rising living standards (Lampman, 1971).

Relative poverty measures, which are in essence inequality measures, have a number of important limitations. A relative measure keeps adjusting the standard for overcoming poverty, making it difficult to understand how absolute deprivation is changing. This is particularly problematic for evaluating policy. For example, when the thresholds are a percentage of median income, anti-poverty policies that affect incomes around the median as well as at the bottom might very well reduce the extent of deprivation but have no impact on a relative poverty measure. The experience of Ireland around the turn of the century is instructive. Ireland grew rapidly during that period with real growth in incomes throughout the distribution including the bottom. However, because the middle grew a bit faster than the bottom, a relative poverty measure shows an increase in poverty while an absolute measure shows a sharp decrease in poverty (Nolan, Munzi and Smeeding 2005). Another troubling example is a recession during which median income or consumption falls. With a recent period of falling officially measured median income in the U.S., we could have relative poverty falling despite a decline in incomes at low percentiles.

### *Changes in SPM thresholds over time*

The SPM is not a true absolute measure of poverty because the value of the thresholds changes in real terms over time. It is also not a pure relative measure of poverty, because the value of the poverty thresholds do not change one-for-one with a change in a point in the distribution of income (like the median). As a result, interpreting changes in the poverty rate as calculated by the SPM is challenging. For example, in a deep recession during which the 30th to 36th percentiles of spending on food, clothing, shelter and utilities fall, the poverty rate as calculated by the SPM might indicate that poverty fell, even at a time when absolute deprivation rose. It is unclear whether changes in the poverty rate generated by the SPM are due to family incomes changing or the thresholds changing, making it difficult to determine whether anti-poverty policies are effective at reducing deprivation.

## *Price Index Bias*

The official measure of poverty is often advertised as an absolute measure, but this characterization is not quite right, because the poverty lines are adjusted upwards over time to account for inflation using the CPI-U, which overstates the true rise in the cost of living. The price index has this bias because it does not take into account sufficiently the arrival of new goods in the market, quality improvements in existing goods, and possibilities for substitution between goods. As we discuss below, this bias has a very significant impact on the long-term changes in poverty rates. Meyer and Sullivan (2012b, pp. 146-148) provide an extensive discussion of the evidence for and implications of the overstatement of inflation in setting the official poverty thresholds.

We show how the price index affects changes in poverty thresholds in Figure 1, where we plot the real value of the 1980 official poverty threshold for a two-adult, two-child family over time using five different price indexes: CPI-U, CPI-U-RS, Chained-CPI-U, PCE, and biased-corrected CPI-U-RS. The official poverty thresholds are adjusted using the CPI-U. A large literature has highlighted significant biases in the CPI-U. The literature on price index bias emphasizes four primary sources of this bias. Substitution bias stems from failure to account for consumers' substitution among goods in response to relative price changes. Substitution bias can be broken down into 1) upper-level bias arising from ignoring substitution among items across expenditure categories and 2) lower-level bias resulting from ignoring substitution among items within a category. Quality change bias arises from not adjusting for quality changes of existing products. New product bias occurs because the CPI market basket does not include new products quickly. New outlets bias arises because the price index does not account for the impact of new outlets on price changes (Lebow and Rudd 2003, Moulton 2018).

To address, in part, these biases, the BLS has revised the methods for calculating the CPI-U on occasion, but it provides a consistent index that applies the current methods to earlier years: the Consumer Price Index Research Series (CPI-U-RS). Because the biases in the CPI-U lead to an overstatement of inflation, the CPI-U-RS adjusted thresholds rise more slowly over time. By 2020, the CPI-U-RS-adjusted threshold is 4.5 percent lower than the official threshold. Differences in these two price indices arise in periods when the BLS made changes to the methods for calculating the CPI-U. One of the most substantive changes to the CPI was the change in how owner-occupied housing was treated. In 1983 the BLS switched from using user cost of owned homes to using the rental equivalent. Between 1983 and 1986, the BLS estimated the Owners' Equivalent Rent (OER) index by reweighting the sample of renters. Starting in 1987, the BLS estimated the OER index using a sample of owners for whom an implicit rent is imputed by matching each owner to a set of renters using location and other characteristics such as housing structure type, age, number of rooms (Moulton 1997, Poole, Ptacek, and Verbrugge 2006). The largest differences between the growth of the CPI-U and CPI-U-RS occurred after this change, between 1987 and 1994. During this period, the CPI-U grew by 26.1 percent, while the CPI-U-RS grew by 30.5 percent. In 1995, the BLS implemented a few methodological changes in how they calculate implicit rent for owned homes (see Poole, Ptacek, and Verbrugge 2006 for details). Starting in 1999, the BLS switched back to the previous rental equivalence approach, reweighting the renter sample to estimate the OER. Since 1999 the growth in the CPI-U and CPI-U-RS are virtually the same.

The Chained CPI-U and the Personal Consumption Expenditures (PCE) indices use somewhat different methods to account for inflation. In particular, the Chained CPI-U uses month-to-month market baskets to reflect substitution between goods and services due to relative price changes. The PCE and the CPI-U are different in terms of formula (Fisher-Ideal vs. Laspeyres formula), weight sources (business surveys vs. a household survey), and the coverage of items and expenditures (out-of-pocket expenditures of households vs. expenditures by households and nonprofit organizations serving households) (Johnson, Reed, and Stewart 2006, McCully, Moyer, and Stewart 2007). Both of these indices indicate less inflation than the CPI-U-RS. Between 1980 and 2020, the CPI-U-RS grew by 200 percent while the Chained-CPI-U grew by 180 percent and the PCE by 170 percent.<sup>12</sup> Consequently, converting the 1980 thresholds into 2020 dollars, the Chained-CPI threshold is 10.9 percent lower than the official threshold, and the PCE-adjusted threshold is 14 percent lower.

Despite changes to the CPI-U to address bias, several studies have concluded that considerable bias remains. The Boskin Commission (Advisory Commission to Study the CPI) estimated that the overall bias in the CPI-U was 1.1 percentage points in 1996. Lebow and Rudd (2003) estimated that the CPI overstated inflation by about 0.9 percentage point in 2001. And Moulton (2018) estimated that the overall bias in the CPI-U is 0.85 percentage points in 2017. Decomposing the sources of the bias, Moulton estimated substitution bias of 0.3 percentage points, new products/quality change bias of 0.37 percentage point, new outlets bias of 0.08 percentage points, and weighting bias of 0.1 percentage points. To account for these remaining biases, we construct a bias-corrected CPI-U-RS index that subtracts 0.8 percentage point from the growth in the CPI-U-RS index each year from 1980 to 2020. Between 1980 and 2002, the bias corrected CPI-U-RS grew by 119 percent. Consequently, converting the 1980 thresholds into 2020 dollars using this index, the bias-corrected threshold is 30 percent lower than the official threshold.

An additional issue is whether the price adjustment for the poor should be the same as the adjustment for overall price changes given that the market basket chosen by the poor is different, and the poor may pay different prices (Moulton 2018, Jaravel 2019). Previous research has argued that differences in price changes by income either suggests little difference or, when the difference is substantial, it applies to a short time period or small share of expenditures (McGranahan and Paulsen, 2005; Broda et al. 2009; Garner et al. 1996). On the other hand, a recent Interagency Technical Working Group on Consumer Inflation Measures (ITWG-CIM, 2021) concludes that inflation is greater for low-income households. This report recommends that a separate price index be constructed to adjust poverty thresholds over time. They construct an experimental CPI that accounts for the fact that low-income consumer units have different budget shares. Their experimental index implies higher estimates of inflation than the CPI-U for the period from 2004 to 2017. The report concludes that more research is needed to determine the best approach for constructing a price index to adjust poverty thresholds. While this experimental index does not correct for the upward bias in the CPI-U noted above, if those at or near the poverty line do experience greater inflation than other families due to different budget

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<sup>12</sup> Chained-CPI-U index goes back to the year 1999. We impute Chained-CPI-U index for years before 1999 using CPI-U-RS index in the corresponding years.

shares, then this would suggest smaller declines in poverty than the results we report below that rely on a bias-corrected CPI-U-RS.

### **B.3 Adjusting for differences in family size: equivalence scales**

Poverty thresholds are typically adjusted to account for the fact that larger families need more resources. The adjustment for differences in family size implicit in the official poverty measure suggests children are more costly than adults in some cases and does not exhibit diminishing marginal increments for additional individuals over the whole range of family sizes (Ruggles 1990). For example, the second child in a two-parent family adds much more to the thresholds than the first or third child. Many alternative family size adjustments have been proposed. A common approach is to specify a function that reflects economics of scale (i.e. that the increase in resources necessary to meet family needs as an individual is added to the family falls as family size rises) and reflects that the needs of children may be lower than those of adults. Such scales offer several important improvements over the scale implicit in the official thresholds. In particular, it is a much more transparent and consistent adjustment for differences in costs across families of different sizes and composition. Unlike the scale adjustment in the official measure, it exhibits diminishing marginal cost with each additional child or adult. Examples, of such scales include those recommended by the NAS panel and those used to calculate the SPM. See Citro and Michael (1995) and Meyer and Sullivan (2012a) for more discussion.

An issue that takes on increased importance if health insurance coverage is incorporated in a poverty measure is the possibility of different equivalent scales for different components of consumption or income. The reasoning behind an equivalence scale is that the cost to obtain a given level of utility for two people is lower than twice that for one, if some goods are not completely “rival in consumption” i.e. can at least be partially shared. For example, housing is often shared. On the other hand, most health expenditures are individual. One person’s blood test or cancer treatment does not reduce the cost of another person’s diabetes drugs. Meyer and Sullivan (2012b) provide an example of how such a situation might be treated.

### **B.4. Geographic adjustments to the thresholds**

Some have argued that the poverty thresholds should vary by geographic area because a family would need more resources to reach a given standard of living in a high cost of living area. Expenditures on some goods that account for a large share of total consumption for families with few resources, such as housing, can vary sharply across geographic areas. On the other hand, at least part of the variation in typical prices reflects geographical differences in local attributes including wages that people choose in deciding where to live. The official poverty rate does not adjust poverty thresholds to account for the considerable variation in living costs across geographic areas. The SPM does make such an adjustment based entirely on differences in rents paid across areas.

The idea of a price index to account for differences in prices is a central idea in economics. However, a long literature in economics suggests that spatial differences in prices reflect



differences in what purchasers obtain for those prices.<sup>13</sup> As a result, the variation in housing prices across locations – which is the sole or central price in geographic price adjustments – may simply reflect variation in locational desirability. Furthermore, a long literature has also highlighted conceptual and data limitations of geographic adjustments and noted that such adjustments probably would not reflect other regional differences such as the level of assistance to low-income families (U.S. Department of Health, Education, and Welfare 1976; General Accounting Office 1995; Black 2011).

Advocates of geographic adjustments to thresholds often argue that if poverty is defined as not being able to purchase a given market basket of goods<sup>14</sup> then that calls for adjusting that market basket for geographic price differences. This argument, however, makes two important logical leaps. First, it assumes a particular implementation of poverty measurement, rather than aiming for the overall goal of identifying the most disadvantaged. Second, it presumes that we can account for attributes of goods such as housing by valuing them, a strong assumption that the hedonics literature suggests may not be warranted, and has been outright rejected by some (Greenstone, 2017). Greenstone argues that omitted variable bias is just too pervasive and the difficulty of estimating inframarginal values of attributes so great that it is not possible to value many housing attributes.

Meyer, Wu and Curran (2022) propose a rigorous approach to assess the desirability of geographic adjustments to poverty measures by examining how well they achieve a central objective of a poverty measure: identifying the least advantaged population. Specifically, they compare an exhaustive list of material well-being indicators of those classified as poor under the OPM, the SPM and a new Comprehensive Income Poverty Measure. They examine these three measures with and without a geographic adjustment. Well-being indicators are drawn from administrative data, the Current Population Survey, and the Survey of Income and Program Participation and include material hardships, appliances owned, home quality issues, food security, public services, health, education, assets, permanent income, and mortality. For nine of the ten domains of well-being indicators, they find that incorporating a geographic adjustment identifies a less deprived poor population. These results are broadly consistent across different poverty measures, various ways of implementing a geographic adjustment, and multiples of the poverty line.

Other research has come to a similar conclusion. For example, Harkness et al. (2009) use the Panel Study of Income Dynamics and its Child Development Supplement and find that children in high cost of living areas are not more disadvantaged on measures of several health and wellbeing outcomes compared to comparable children in regions with lower housing costs.

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<sup>13</sup> In one of the most commonly used spatial equilibrium frameworks, consumers are modeled as willing to pay more in certain areas to consume higher-quality amenities (Rosen 1974, Haurin 1980, Roback 1982). Relatedly, Tiebout (1956) hypothesized that individuals sort themselves across geographies according to their preferences for public goods. Empirically, this sorting leads to increased housing prices in communities with higher levels of public goods provision (Oates 1969, Epple 2008, Brueckner 2011).

<sup>14</sup> See Ruggles (1990) pp. 2 and 84 or NAS (1995) p. 184.

### **C. Poverty indicator vs. poverty intensity**

The focus of this discussion has been on the narrow, but ubiquitous, head count measures of poverty—the fraction of all individuals whose resources fall below a specified threshold. Such measures overlook important information about the extent of deprivation. By focusing on a single point in the distribution of resources, we learn very little about what is going on far away from the cut-off; the well-being of the extremely poor, for example, may fall even as the overall poverty rate is declining. Poverty researchers have examined a number of different measures to capture the material circumstances of those with resources far from the thresholds. For example, one might look at the fraction of individuals who fall below 50 percent of a specified threshold (deep poverty) or 150 of the threshold (near poverty). Some researchers have examined the fraction of people in the U.S. with income below a very low threshold such as \$2 per day, the threshold used by the World Bank to identify extreme poverty (Shaefer and Edin, 2013). Alternatively, one might measure the poverty gap, defined as the sum over all poor individuals of the difference between the poverty threshold and family resources. The gap is a measure of the intensity of poverty and is often thought to be a better measure of deprivation than head count measures (Dasgupta 1993, Deaton 1997).

### **V. Data quality and measurement issues**

All of the major poverty indicators in the U.S. rely on survey data, and the validity of these indicators depends critically on the quality of the data collected. Of particular concern is the ability of surveys to accurately capture family resources, either income or consumption. Above, we discussed how, on conceptual grounds, consumption is a better measure of the material circumstances of the poor than income. Here, we discuss the evidence on data quality for these two measures, focusing on the primary source for income—the Current Population Survey (CPS)—and consumption—the Consumer Expenditure Survey (CE)—data in the U.S. We emphasize that concerns about income data quality are a strong argument for relying on consumption measures of poverty.

#### **A. Income Under-Reporting**

Income in the CPS is substantially under-reported, especially for categories of income important for the poor. Furthermore, the extent of under-reporting has increased over time. Meyer, Mok and Sullivan (2015) report comparisons of weighted micro-data from the CPS ASEC to administrative aggregates for government transfers and tax credits. We have extended their calculations to recent years. In 2019, more than half of benefits paid through the TANF program and SNAP and nearly half of Workers' Compensation program benefits were not recorded in the survey. More than one-third of unemployment insurance benefits, 20 percent of Social Security Disability benefits and nearly 15 percent of Supplemental Security Benefits were missed as well. The degree of under-reporting has increased sharply over time for most income sources. In 1995, only 36 percent of food stamp dollars paid out to families were not recorded in the CPS. By 2020 that figure had risen to 55 percent. In 1995, only 15 percent of unemployment insurance dollars were missed, but by 2020 that figure had reached a shocking 62 percent of the over half a trillion dollars paid out that year.

Rothbaum (2015) provides similar comparisons for almost all components of pre-tax money income. In the most recent year reported, 2012, only 2.5 percent of wage and salary earnings are missed, but two thirds of self-employment income is not recorded and nearly one-third of pension income. Tax credits such as the EITC and CTC that are especially important to those with low incomes, are also understated in the CPS ASEC. These credits are not reported by survey respondents, but rather imputed by the Census Bureau. The Census Bureau typically identifies fewer people as being eligible than tax records indicate receive these credits. Meyer et al. (forthcoming) finds that in 2010 nearly one-third of EITC dollars and 20 percent of CTC dollars were missed.

The above patterns were assessed by comparing weighted microdata to administrative aggregates, are for dollars not recipients, and reflect underreporting by some recipients and over-reporting by others. An alternative approach links administrative microdata from tax or program records to the CPS directly at the individual level. Results from such linkages are available for fewer income sources and years but provide a similar picture. Meyer and Mittag (2019) find that 43 percent of SNAP recipients, 63 percent of TANF or General Assistance Recipients and 36 percent of housing assistance recipients in New York State over the 2008-2011 period did not report receipt. Meyer, Wu, Stadnicki and Langetieg (2022) find that 39 percent of UI recipient nationwide did not report receipt in 2010.

Similar linked data indicate that there is also severe under-reporting of government transfers in other household surveys such as the American Community Survey, which has been used to implement state and local versions of the SPM, and in the Survey of Income and Program Participation which is generally thought to be the Census Bureau survey with the most complete income data (Gathright and Crabb 2014; Meyer, Mittag and Goerge, 2018). The former paper also shows a pronounced increase over time in false negative reporting of Social Security retirement, disability and SSI benefits.

Other evidence suggests that the quality of income data from surveys is particularly bad for those with extremely low reported income. As we discuss below, the observable characteristics of those with very low income strongly suggest that income is mis-measured for this group. For example, those with income below 50 percent of the poverty cut-off appear better off than those below 100 percent, and many families with extremely low reported income in surveys are actually well off in consumption terms (Meyer and Sullivan, 2011, 2012a). This evidence is particularly worrisome for measures that focus on deep income poverty or extreme income poverty. In fact, Meyer, Wu, Medalia and Mooers (2021) find that a large share of those with survey reported income below \$2 per person per day, have income above the poverty line based on administrative data.

## **B. Consumption Under-Reporting**

There is also substantial evidence that at least some types of consumption are under-reported in the CE and that this under-reporting has increased over time. To assess the degree of under-reporting, CE data have been compared to data from many sources, most commonly the Personal Consumption Expenditure (PCE) data from the National Income and Product Accounts. In the most comprehensive study of this issue, Bee, Meyer, and Sullivan (2015) survey this literature

and provide new estimates on expenditure under-reporting in the CE. They show that among the eight largest comparable categories of expenditures six are reported at a high rate and that rate has been roughly constant over time. These well-measured categories are the imputed rent on owner-occupied nonfarm housing (i.e. the consumption value of owning a home), rent and utilities, food at home, gasoline and other energy goods, communication and new motor vehicles. In 2010, the ratio of CE to PCE is 0.95 or higher for imputed rent, rent and utilities, and new motor vehicles. It is 0.86 for food at home, 0.80 for communication, and 0.78 for gasoline and other energy goods. The largest poorly measured expenditure categories are food away from home with a ratio of 0.51, furniture and furnishings at 0.44, clothing at 0.32, and alcohol at 0.22. Many of these poorly measured categories are a small share of the budgets for disadvantaged families.

However, these aggregate numbers likely overstate the weakness of the data for the typical person and even more so for the poor. Sabelhaus et al. (2015) examine the representativeness of the CE by income. They match CE respondent and non-respondent households to income at the zipcode level. They find that there is a small under-representation of those from the top four or five percentiles of zipcode level income and no under-representation (maybe a slight over-representation) at the bottom of the zipcode level income percentiles. Much more important quantitatively, they find that the income reported in the survey, either because high income people are missing or because income is under-reported at the top, does not match well to other sources such as the Survey of Consumer Finances and tax records. Furthermore, reported spending relative to income is very low at the top. The finding that much of the under-reporting of expenditures occurs at the very top of the income distribution means that the aggregate under-reporting statistics likely overstate the weakness of the CE for a typical person and even more so for the typical poor person.

### **C. Income vs. Consumption**

A case for the accuracy of income would note that, for most people, income is easier to report given that much of it is recorded in tax records and that it typically comes from a small number of sources (predominantly earnings). However, for analyses of families with few resources this argument is less valid, as these families tend to have many, often sporadic, income sources (Edin and Lein, 1997). Additionally, while income may be easier to report for some, it is likely to be a more sensitive topic for survey respondents than consumption.

In fact, four pieces of empirical evidence present a strong case that consumption is a better measure of economic well-being for the poor than income. First, as discussed above, components of consumption that are particularly important for the poor are fairly well-captured in surveys while components of income important to the poor are not captured well. Second, while both income and consumption appear to be under-reported, the problem is worse with income. For those at the bottom, consumption exceeds income. This is evident even for those with little or no assets or debts, so the discrepancy cannot be due to borrowing or drawing down assets. It is also particularly true the further down the distribution you go (Meyer and Sullivan 2003, 2011). For families in the bottom five percent of the income distribution, expenditures exceed income by more than a factor of 7 (Meyer and Sullivan, 2011). Third, consumption is a much better predictor of deprivation than income; in particular, material hardship and other adverse family

outcomes are more severe for those with low consumption than for those with low income (Meyer and Sullivan 2003, 2011, 2012a). Finally, evidence from other countries is consistent with that for the U.S. In their paper, "Why are Households that Report the Lowest Incomes so Well-Off?", Brewer, Etheridge, and O'Dea (2017) show that on average in the UK spending is much greater among families with extremely low income than those with just very low income. The authors conclude that this is mostly due to under-reporting of income.

## **VI. Who is Poor and How well poverty measures identify the most disadvantaged**

All of the choices in constructing a poverty measure discussed above will affect who is designated as poor. Some choices, such as the resources measure, play a big role, while others, such as the equivalence scale and resource sharing unit, are less important. These choices lead some poverty measures to be much better than others at identifying those who are the most disadvantaged.

To determine how the composition of those designated as poor differs across different approaches for defining poverty, and how well these different measures identify those who are most disadvantaged, we examine the observable characteristics of those designated as poor using three different poverty measures: official poverty, the SPM, and consumption poverty. These results, which are reported in Table 1, rely on data from the Consumer Expenditure Survey for reference year 2020.<sup>15</sup> For appliances and amenities, however, we report these means for a sample for reference year 2012, the most recent year that complete information on ownership of these goods is available. To ensure that differences in mean characteristics are not simply the result of looking at different cutoffs in the distribution of resources, we keep the baseline poverty rate constant at the Supplemental Poverty Measure rate in 2020 (9.1 percent). Thus, each of the three measures of poverty designates the same number of individuals as poor.

The demographic characteristics in Table 1 clearly show that the three poverty measures differ considerably in who is designated as poor. The consumption poor are much more likely to live in a married parent family and less likely to have a head 65 and over. That elderly households are less represented among the consumption poor is consistent with the fact that these households are more likely to rely on assets and the consumption of durables than other households, which would be reflected in a consumption-based measure, but not an income-based measure. Below, we present poverty rates separately by demographic group, and these results show that income poverty rates are much greater than consumption poverty rates for the elderly (Tables 2 and 3). Looking at other characteristics, we see that compared to the income-based measures, the consumption poor are more likely to have a non-minority head.

### *The Relationship between Poverty and Other Indicators of Well-being*

The results in Table 1 also show which measures are most strongly associated with other indicators of disadvantage. These results show that those categorized as "poor" by the SPM appear less disadvantaged than the official poor: they have higher consumption, are much more likely to have private health insurance, are more likely to own a home and various appliances,

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<sup>15</sup> These results update similar analysis from Meyer and Sullivan (2012a).

are slightly more educated, and have accumulated more assets. Conversely, those categorized as “poor” by the consumption measure appear more disadvantaged than the official poor: they have much lower consumption, are less likely to have health insurance, are less likely to have many of the amenities or appliances, and are less educated.

Because most people who are classified as poor under one measure will also be classified as poor by another measure, the means for characteristics of these groups, such as those reported in Table 1, will inevitably be similar. Another, perhaps more useful, way to compare two measures of poverty is to focus on the characteristics of those whose poverty status is altered in moving from one measure to another. A poverty measure that more accurately identifies the disadvantaged would add to poverty individuals who are worse off in other dimensions than those who are subtracted. Such an exercise is an indicator of which poverty measure of material well-being is most correlated with other measures of well-being. Results from this exercise from Meyer and Sullivan (2012a) shows that, compared to the official poverty measure, the SPM does a poor job of identifying the disadvantaged. The SPM adds to poverty individuals who are more likely to be college graduates, own a home and a car, live in a larger housing unit, have air conditioning, health insurance and substantial assets, and other favorable characteristics than those who are dropped from poverty. On the other hand, we find that a consumption measure, compared to the official measure or the SPM, adds to the poverty rolls individuals who appear worse-off. These results present strong evidence that a consumption-based poverty measure is preferable to the official income measure and the SPM for determining who are the most disadvantaged.

Meyer and Sullivan (2012a) also examine how the characteristics of those in deep poverty—having resources below half the poverty line—differ across these three poverty measures. In general, the results for deep poverty are similar to those discussed above: compared to the official measure, individuals added to deep poverty by the SPM appear better off than those subtracted. In addition, compared to the official measure, those added to deep poverty by a consumption-based measure appear worse off than those subtracted. In fact, using the SPM, those below 50 percent of the poverty line appear better off than the larger group below 100 percent of the poverty line. This finding is consistent with other research that has shown that many families with extremely low reported income in surveys are actually well off in consumption terms, suggesting significant underreporting of income for these families (Meyer and Sullivan 2011). Below we show that the trends for income and consumption poverty differ most noticeably when examining deep poverty.

Official poverty, the SPM, and consumption poverty differ in how resources are defined and how thresholds are adjusted for family size. A decomposition of these different features shows that how resources are measured has a very significant impact on accurately identifying who is poor, while the impact of changes in the equivalence scale is much smaller. If one compares two poverty measures that only differ in that one is measured using income and the other using consumption, the latter does a much better job identifying the disadvantaged. Within income measures of poverty, ones that subtract medical out of pocket spending (as does the SPM) do a much worse job at identifying the disadvantaged than those that do not subtract such expenses. See Meyer and Sullivan (2012a) for more discussion.

The results also suggest that some largely untested but common presumptions may turn out to be wrong. For example, many researchers have argued that income after accounting for taxes and noncash benefits more closely reflects material well-being than pretax money income. While this may be true conceptually, in practice accounting for taxes and noncash benefits may not help if they are imprecisely measured in income data sources. Often taxes and benefits are imputed based on little relevant individual information. In fact, a comparison of pre-tax and after-tax income poverty measures suggests that the latter measure does not do a better job of identifying the disadvantaged. Taken together, these analyses raise the question as to whether income, even when modified to be conceptually closer to consumption (an approach taken by the SPM and many other alternative poverty measures), can reliably be used to measure well-being for the most disadvantaged.

How poverty is measured has an important impact in our understanding of which groups are in greatest need. One of the most noticeable differences between the SPM and the official measure is that poverty rates by age change sharply. In 2020, the official poverty rate for children was 16.0 percent while the SPM rate was 9.7 percent. For those 65 or older, the official poverty rate was 8.9 percent while the SPM rate was 9.5 percent (Creamer et al. 2022). A range of other evidence shows that the economic circumstances of the elderly are better (and the poverty rate is much lower) than that of other groups, which is inconsistent with the estimates of who is poor from the SPM. In 2020, two-thirds of those in the bottom income quintile of the elderly owned a home; conversely, for the bottom income quintile of children, 38 percent lived in an owned home. The elderly also have considerably more assets than those in the bottom income quintile of other age groups. In 2020, the 75 percentile of financial assets of the low-income elderly were 2.8 times greater than those of children in low-income families, and 1.3 times greater than those of low-income non-elderly adults.

The major reason for these differences by age traces back to the subtraction of medical out-of-pocket expenses from income when calculating the SPM. Fox and Burns (2021) reports that subtracting medical out-of-pocket expenses raises overall poverty by 1.5 percentage points, while no other incremental change has more than a 0.8 percentage point effect. This adjustment disproportionately affects the elderly; subtracting medical out-of-pocket expenses raises their poverty rate by 2.7 percentage points.

It is troubling that this change has such a large impact, because subtracting out-of-pocket medical spending is probably the most controversial of these adjustments on a priori grounds. On the one hand, large out-of-pocket medical expenses resulting from poor health can drain family resources. On the other hand, these expenses can arise because families choose to allocate resources towards health, purchasing expensive health insurance or electing to have procedures that are not fully covered by insurance. It is difficult a priori to determine whether most out-of-pocket medical spending reflects those with lower health status or those who have greater resources and make choices to spend more on out-of-pocket health care costs. But the evidence shows that when out-of-pocket medical expenses are subtracted from income to calculate poverty, those identified as “poor” have higher consumption, more education, more rooms in their home and are more likely to be covered by health insurance. This pattern is consistent with a belief that many families with large medical out-of-pocket expenses have the resources to support such spending, and they are making a choice to spend as much as they do on medical

care. The importance of this issue, and its substantial impact on who is defined as poor, suggests a need for more research on the determinants of out-of-pocket health care spending.

## **VII. Trends in poverty**

Trends in official poverty inform the conventional wisdom that the U.S. has made little progress in reducing poverty. Many have argued that trends in official poverty show that the panoply of income support programs, from food stamps to unemployment insurance, have been ineffective anti-poverty tools. In 1995 former House Ways and Means Committee Chairman Archer stated, “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 have lost the war.” More concisely, President Reagan said, “we fought a war on poverty, and poverty won.” This line of argument has led to calls to abandon the safety net (Murray 1984, Tanner 2012).

Unfortunately, this argument is based on an official poverty measure with well-known flaws. In this section we show that simple adjustments that address these flaws lead to the conclusion that poverty has fallen sharply. The most important factors that affect trends in poverty are how resources are defined and how thresholds are adjusted over time for inflation. Other features of a poverty measure such as how one specifies the resource sharing unit or how one adjusts for differences in family size have a much smaller impact on changes over time.

In the results comparing trends across poverty measures that follow we do not use the official poverty thresholds for all measures. Rather for alternative measures reported below, we specify thresholds that equate poverty in the baseline year (2000). Specifically, for each alternative poverty measure we find thresholds such that the poverty rate for that measure (after adjusting for family size) is equal to that of the official poverty rate in 2000 (11.3 percent). Anchoring our alternative measures to the official measure facilitates comparisons of trends, allowing us to examine the same point of the distribution in 2000 so that different measures do not diverge simply because of differential changes at different points in the distribution of resources. To obtain thresholds for other years, the thresholds are adjusted for inflation using a price index. Our choice to anchor in 2000 does not qualitatively affect the conclusions we draw about differences in changes in poverty over time across measures, although it will affect the level of poverty in a given year.

### **A. The impact of price indices on poverty trends**

Among the most important factors affecting poverty trends is how thresholds are adjusted over time for inflation. As discussed above, there is a well-known upward bias in the CPI-U, the index used to adjust official poverty thresholds for inflation, and although the BLS has changed the methodology used to calculate the CPI-U to address some of these biases, some bias remains. Figure 2 reports changes in money income poverty (the resource definition used for official poverty) using four different price indices: the CPI-U, CPI-U-RS, the PCE, and our bias-corrected CPI-U-RS. These results show that the well-known upward bias in the CPI-U has an enormous effect on changes in poverty over long periods. When adjusting thresholds using the CPI-U-RS, the money income poverty rate decreases by 2.8 percentage points between 1980 and



2020, as compared to a 1.7 percentage point decline when the CPI-U is used. As one moves toward a price index that comes closer to what past research suggests would be an unbiased measure of inflation, trends in poverty are considerably more favorable. Money income poverty declines by 4.6 percentage points between 1980 and 2020 when the PCE is used, and by 8.5 percentage points, from 17.8 to 9.3 percent, when the bias-corrected CPI-U-RS is used.

## **B. The impact of resources on poverty trends**

How resources are measured also has a substantial impact on changes in poverty. Figure 3 presents poverty rates for three measures that differ in how resources are defined, either as money income, after-tax money income plus noncash benefits (including the cash value of SNAP, school lunch, and housing subsidies), or consumption. For each of the three measures, we adjust the thresholds over time using the bias-corrected CPI-U-RS, and anchor the thresholds to the official poverty rate in 2000 (11.3 percent). If we anchor in different years, the levels differ the trends are similar (Appendix Figures 1a and 1b). Our results show that conceptually better measures of resources indicate a greater decline in poverty over time. A money income measure does not reflect tax credits like the Earned Income Credit and Child Credit and does not include food stamps, housing benefits and other in-kind transfers. Such programs are an increasing share of our domestic anti-poverty efforts. Accounting for both taxes and noncash benefits, poverty fell by 16.6 percentage points, from 22.5 to 6 percent, between 1980 and 2020, which is nearly twice as large as the decline in the measure based on just pre-tax money income. Burkhauser et al. (2021), Wimer et al. (2016), and Meyer and Sullivan (2012b) also find significant declines in income-based poverty when a more comprehensive measure of income is used.<sup>16</sup>

Consumption measures indicate a similar decline in poverty for the overall period.<sup>17</sup> Between 1980 and 2020 consumption poverty fell by 17 percentage points. Although the overall change is similar for consumption- and income-based poverty, there are some sharp differences for some subperiods. Between 2003 and 2008, for example, income poverty was virtually unchanged, while consumption poverty fell by 4 percentage points. Between 2008 and 2010, consumption poverty rose by 1.4 percentage points (21 percent), while after-tax income plus noncash benefits poverty was virtually flat. Although the recession officially began in 2007, unemployment rates did not start to rise sharply until mid-2008 and the sharpest rise in unemployment occurred from November 2008 through January 2010, making it all the more surprising that after-tax income plus noncash benefits poverty did not rise more during this period.

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<sup>16</sup> Burkhauser et al. (2021) extend their analysis of after-tax income plus noncash benefits to earlier years and show that between 1962 and 1980 this poverty measure falls much more than does a measure that does not include taxes and noncash transfers. We do not include these earlier years in our analyses because prior to 1980 less information on noncash benefits was available and therefore more imputation is necessary, and consumption data were not available for each year and were more limited. For comparability of consumption data prior to 1980, see the data appendix in Meyer and Sullivan (2012b).

<sup>17</sup> To address concerns about underreporting of consumption in the CE Survey, prior work has focused on well-measured categories of consumption (Meyer and Sullivan 2022). However, for well-measured consumption to be an adequate proxy for total consumption its share of total consumption must be roughly constant, a condition that did not hold in the most recent year due to the pandemic (Meyer, Murphy, and Sullivan, 2022). As shown in Appendix Figure 2, changes in poverty for well-measured consumption are very similar to those we report in our main results using total consumption.

Even more pronounced differences between income and consumption poverty are evident for the trends by family type. We report income and consumption poverty rates for five mutually exclusive and exhaustive family types in Table 2: single parent families, married parent families, single individuals, married couples without children, those with head 65 and over. These results are an update of Table 2 in Meyer and Sullivan (2012b). For the full period, the decline in consumption poverty noticeably exceeds the decline in income poverty for single individuals with consumption poverty falling by 15.8 percentage points while income poverty falls by 11.6 percentage points. For households with a head 65 and over, in contrast, consumption poverty falls less than income poverty, with consumption poverty falling by 28.0 percentage points while income poverty falls by 26.0 percentage points. As was the case for the full sample, income- and consumption-based poverty diverge for some periods within family types. For example, since 2000 consumption poverty has fallen more sharply than income poverty for families with children and for single individuals, but not for married couples without children or for families with a head 65 or older.

The estimates in Table 3 show that both income- and consumption-based poverty declined sharply for all age groups. Both measures of poverty fell by more than 20 percentage points between 1980 and 2020 for children and those 65 and over. The most noticeable decline over this period is in consumption-based poverty for the elderly, which fell 25.7 percentage points (92 percent), and now stands at 2.2 percent. While the declines are comparable across measures for the full period, the trends differ for some subperiods. For example, between 2000 and 2020 income-based poverty for children fell by 7.6 percentage points (52 percent) while consumption-based poverty fell by 11.7 percentage points (71 percent). That the differences across measures are particularly noticeable for children in recent years is consistent with concerns about measurement error in components of income such as means-tested transfers that target families with children. We discuss these measurement error concerns in Sections V and IX.

We also consider how poverty trends differ across race and ethnicity groups (Table 4). Again we see that poverty falls sharply over the full period for all of these subgroups. Looking at differences across measures, we see the most noticeable differences were evident for minority race and ethnicity groups over the past two decades. For example, for Black Americans, income-based poverty fell by 11 percentage points (54 percent) between 2000 and 2020, while consumption-based poverty fell by 17 percentage points (79 percent).

The most striking differences between the patterns for income and consumption poverty are evident for measures that focus on the bottom of the distribution such as measures of deep poverty. In Figure 4, we show trends in deep poverty rates using consumption and income measures. We set the deep poverty threshold in 2000 to 50 percent of the poverty thresholds used in Figure 3. Figure 4 shows noticeable differences in the trends for consumption and income deep poverty. While the income based deep poverty rate remained flat for much of the past four decades depending on the income measure, the consumption based deep poverty rate significantly declined during the same period. In particular, the deep poverty rate based on after-tax income plus noncash benefits fell by 36 percent (from 4.6 to 2.9 percent) between 1980 and 2020, and most of this decline occurred in the most recent three years. By contrast, during this same period the consumption based deep poverty rate fell sharply by 90 percent from 3.1 to 0.3 percent.

### **C. The impact of other components of a measure on poverty trends**

While how one accounts for inflation and how one measures resources have a significant effect on changes in poverty over time, other components of a single-dimensional poverty measure have a much smaller impact on changes over time. In Appendix Figure 3, we report poverty rates for the 1980-2020 period for three measures, all based on pre-tax money income with thresholds adjusted over time using the CPI-U. Two of the measures use the same resources-sharing unit (the family) but different equivalence scales to account for differences in needs across families of different sizes and composition. One measure relies on the implicit equivalence scale in the official poverty measure, which is determined by the different thresholds across family size and composition. The other measure adjusts resources using the scale recommend by the 1995 NAS report (Citro and Michael, 1995) that allows for differences in costs between adults and children and exhibits diminishing marginal cost with each additional adult equivalent. In particular, we scale income by  $(A + 0.7K)^{0.7}$ , where A is the number of adults in the family and K is the number of children. As is evident in this figure, the changes in poverty are very similar across these two measures. In fact, these two series are virtually on top of each other, and the difference in the change in poverty between 1980 and 2020 across these two measures is 0.1 percentage points, suggesting that the choice of equivalence scale has virtually no effect on changes over time in poverty for the full sample.

Comparing the two measures that use the same scale (NAS scale) but different resource sharing unit (family versus household), we see that the choice of resource sharing unit has a modest effect on changes in poverty over time. The difference in the change in poverty between 1980 and 2020 across these two measures is 1.9 percentage points, but nearly all of this difference occurs before 1997; the two series are very similar over the past two decades.

### **VIII. What explains the decline in poverty rates?**

There are a number of potential explanations for why poverty fell over the past several decades, including changes in government tax and transfer programs, economic growth, changing demographics (such as greater educational attainment, declining family sizes, aging population, etc.), or other factors. While it is difficult to determine the precise contribution of each of these, it is clear that some of these factors played an important role. Below we provide some specific evidence on the impact of government policies and changing demographics.

#### *The role of tax and transfer policy*

To determine the impact of tax and transfer policy on poverty one can compare poverty trends for pre- and post-tax measures of poverty as well as those that include and exclude transfers. In interpreting changes in poverty due to tax and transfer programs, one must keep in mind that changes in taxes and transfers may alter pre-tax and pre-transfer incomes. However, the effects of the tax changes on poverty, ignoring the behavioral responses, are likely to understate the effects of tax changes (such as the EITC) on employment and earnings given the evidence in the literature (for summaries see Hotz and Scholz 2003, Eissa and Hoynes 2006, Meyer 2010). On

the other hand, transfer programs likely reduce pre-transfer earnings, suggesting that any direct poverty reducing effects of these programs would overstate the effects incorporating behavioral responses (Danziger et al. 1981, Moffitt 1992, Krueger and Meyer 2002). Ben-Shalom, Moffitt, and Scholz (2012) conclude that the overall effect of transfer programs on pre-transfer incomes is small relative to their mechanical poverty reduction effects, suggesting that the estimates provided here are a good guide to ones accounting for behavioral effects.

Tax policy has had a substantial impact on poverty rates, though the impact is not steady or even in the same direction over time. The effect of income and payroll taxes can be seen by comparing money income poverty to after-tax money income poverty in Figure 5. The differences between these two measures can be traced to specific changes in tax provisions. Due to the Tax Reform Act of 1986, there was a decline in after-tax money income poverty relative to money income poverty between 1986 and 1988, the first period during which the EITC was expanded (and the personal exemption and standard deduction were increased). The effect of further EITC expansions is even more noticeable between 1990 and 1996, when after-tax money income poverty fell by 1.5 percentage points more than money income poverty. This widening gap coincides with the period of greatest expansion of the EITC under the 1990 and 1993 budget acts. Between 1996, when these expansions were fully phased in, and 2008, trends in poverty stay consistent between these two measures. Between 2008 and 2009 pre-tax income poverty rose noticeably more than after-tax income poverty, reflecting provisions in the American Recovery and Reinvestment Act of 2009 that expanded tax credits including the EITC, the child and additional child tax credits, and the Making Work Pay tax credit. The results in Figure 5 likely understate the effect of the EITC and other tax credits on poverty given the evidence on the understatement of these credits in the CPS-ASEC, even when imputed using TAXSIM (Meyer et al., forthcoming).

Payroll taxes were reduced for two years beginning in 2011, but with the expiration of that provision and of the Making Work Pay tax credit, after-tax poverty rose slightly relative to pre-tax poverty by 2018. The most noticeable difference in changes for before- and after-tax income poverty is evident in 2020, as the after-tax measure included the stimulus payments, or Economic Impact Payments (EIPs). These payments of up to \$1,200 per adult and \$500 for each qualifying child were a sizeable fraction of pre-tax income for low-income families.

The pattern of changes in poverty by family type reinforces the evidence on the effect of tax credits (results not reported). Single parents are by far the most likely group to receive the EITC, followed by married parents. Bearing this out, the post-1986 difference between pre- and post-tax money income is most pronounced for single parents and to a lesser extent married parents. The changes in the two measures over time are almost the same for single individuals and families headed by someone 65 or older.

In a similar fashion, one can determine the impact of transfer programs by comparing poverty measures that include these programs in resources to those that exclude them. In Figure 6 we report poverty rates for money income poverty and another measure that excludes from money income reported social security and disability income (OASDI). OASDI accounts for the lion's share of government cash transfers for those in the bottom income quintile (about three-quarters of transfers in 2009). In general, these results show that OASDI has played an important role in

the decline in poverty. The results in Figure 6 indicate that OASDI alone accounts for a 6.3 percentage point decline in poverty between 1980 and 2020. The importance of OASDI relative to other transfer programs is also evident at a point in time as has been emphasized by Ben-Shalom, Moffitt and Scholz (2012). Why has OASDI led to a decline in poverty? The real value of social security benefits have risen over the past three decades because the CPI, which is used to adjust benefits after retirement, overstates inflation, and because the growth in average earnings in the economy (which is used to index initial benefits) has increased relative to the CPI.

Similar analyses for the 1960s and 1970s show that OASDI played an even bigger role in declining poverty rates in earlier years. Between 1967 and 1977 average reported OASDI benefits received by those in the bottom income quintile in the CPS grew by 39 percent in real terms due to both a rise in initial benefits for new retirees and increased benefits for existing recipients (Meyer and Sullivan, 2012b).

Reported government cash transfers other than OASDI (UI, workers compensation, veterans' payments, SSI, and AFDC/TANF) have had a much less noticeable impact on poverty patterns (Meyer and Sullivan, 2012b). However, the role of these cash programs is likely understated due to the rising under-reporting of these transfers in the CPS (and other surveys) as discussed in Section V.A. Also, related research has shown that these programs do lift a significant number of people out of poverty at a point in time (Hoynes et al. 2006, Ben-Shalom et al. 2012). In addition, these cash transfers appear to smooth income over the business cycle, with the poverty rate for the measure excluding other cash transfers rising more when the economy is contracting, and falling more when the economy is expanding. For example, as the economy contracted considerably between 2007 and 2010, the poverty rate based on income excluding other cash transfers rose by nearly 1.3 percentage points more than money income poverty (Meyer and Sullivan, 2012b). Much of this difference can be accounted for by rising UI benefits, which expanded considerably during this period as the number of unemployed grew and benefits were extended for the long term unemployed starting in 2008.

Comparable analysis looking at the effect of noncash transfers (food stamps, housing and school lunch subsidies, Medicaid, Medicare, and employer health benefits) on changes in poverty rates, shows the impact is small. However, as with cash transfers, the impact of noncash transfers is understated due to rising under-reporting. Also, noncash transfers have been shown to reduce the extent of poverty at a point in time (Hoynes et al. 2006, Ben-Shalom et al. 2012). Meyer and Wu (2018) apply combined survey and administrative data to these analyses and tend to find larger effects.

An important topic for future research is to examine the effect of tax and transfer programs on consumption poverty. Such analyses can be done using consumption as the measure of base resources, which has the advantages (and disadvantages) of consumption poverty. Such analyses are most justifiable when there is little saving or dissaving by the poor, but that is also true of analyses of transfer effects on income poverty.

### *The role of demographics*

In Table 5, we analyze the role of demographics including family type, employment, race, region and education, on the changes in income and consumption poverty rates over time. We might expect that the decline in overall employment, the increase in single parent families and single individuals, and the changes in the population by region and race would have led to higher poverty over time. On the other hand, we might expect the increase in education over time, particularly the decline in the share of those without a high school degree, would have led to lower poverty rates. To determine the effect of changing demographics on poverty, we calculate the predicted changes in poverty over time if poverty rates within demographic groups remained fixed at the level in 1980, but only the shares of family types and other demographics changed.

In general, demographic changes other than increased education explain only a small share of changes in poverty since 1980. Changes in family type typically predict increasing poverty. Thus, family type changes cannot explain the fall over time in income or consumption poverty. Changes in employment are predicted to have small effects on poverty rates in all periods, and changes in race predict increasing poverty. Education is predicted to have a substantial poverty reduction effect for both consumption and income. Between 1980 and 2020, nearly half of the decline in consumption poverty can be explained by increased educational attainment.

## **IX. Why do income and consumption patterns differ?**

The two most plausible explanations for the differences between the changes in income and consumption poverty are errors in income measures and saving and dissaving. As discussed earlier, there is considerable evidence that there has been a deterioration in the reporting of income for families with few resources. This evidence strongly suggests that income under-reporting is especially pronounced at the very bottom and is a likely explanation for the large differences between consumption and income poverty measures that focus on the distribution below the poverty line such as deep poverty.

Several Census Bureau projects examine the importance of income misreporting for poverty measurement. Bee and Mitchell (2017) link Social Security benefit data, IRS earnings and pension data to the CPS ASEC. They find that the poverty rate of those 65 and older in 2012 falls from 9.1 percent based on the survey data alone to 6.9 percent based on the administrative data. Meyer and Mittag (2019) link New York administrative micro-data for four government transfer programs to CPS micro-data to for the same individuals and find that including unreported transfers more than doubles the recorded income of those with official pre-tax income below half the poverty line. These papers focus on two of the groups for whom income and consumption poverty are particularly different, the elderly and those in deep poverty. In both cases the survey and administrative data combined through linkage indicate poverty patterns similar to those from the consumption data. The heightened divergence as one goes down the income distribution is also indicated by Meyer, Wu, Medalia and Mooers (2021). This paper, which is an early analysis (with less sophisticated methods and limited data) from the Comprehensive Income Dataset (CID) project described below, finds that more than 90 percent of those with survey reported cash income below \$2/person/day have income above that mark (and usually much higher) when one includes tax credits, housing and SNAP benefits and accounts for misreporting of earnings, other cash income sources, and government benefits.

From a more mature version of the CID project involving more administrative data coverage Corinth, Meyer and Wu (2022) show that income underreporting has a big impact on poverty at a point in time and changes in poverty over time, and it has a much larger effect on deep poverty than poverty. Relying on the CPS data for 2016, the paper finds that in single parent families pre-tax money income poverty falls by 17 percent when incorporating administrative data, and after-tax and in-kind transfer poverty falls by 42 percent. Pre-tax money income deep poverty falls by a much larger 44 percent when incorporating administrative data and after-tax and in-kind transfer deep poverty falls even more when incorporating administrative data--over 50 percent. These results show the greater impact of better income measurement on deep poverty and poverty measures that more closely accord with income available for consumption. Unfortunately, the currently available results are only for single parent families.

The combined survey and administrative data also indicate a much greater poverty decrease over the 1995 to 2016 period than survey reported income, more in line with the consumption data. Focusing on after-tax income plus in-kind benefits, poverty falls 45 percent over the 21-year period measured using survey reported income, but 62 percent using the linkage combined data. Deep poverty according to the survey rises 9 percent, but falls more than 20 percent in the combined data. The results using survey and administrative data combined through linkage more closely accord with consumption data than the uncorrected income data as they indicate a greater fall in poverty over time than the uncorrected income data do, as is the case for the consumption-based poverty measures. These comparisons provide strong evidence that mismeasurement of income is a main source of the difference between survey income poverty and consumption poverty. When we correct survey income, it aligns much more closely with levels, differences across cutoffs, and the changes over time seen for consumption poverty.

The CID Project is likely to shed brighter light on the question of why income and consumption measures differ and which one should be more heavily relied upon. This project links the main Census Bureau surveys, the CPS, SIPP, ACS, Decennial Census and Consumer Expenditure Interview Survey to a broad set of administrative data covering tax filings and information returns, and benefits from the Social Security Administration, Veterans' Administration, Department of Housing and Urban Development, state SNAP and welfare programs.<sup>18</sup> Analyses from this project will allow other comparisons of how underreporting affects poverty at a point in time and over time, and to see how corrected income data compare to consumption data. A component of this project involves linking administrative income data to the Consumer Expenditure Interview Survey to allow comparison of income and consumption measures from the same survey after incorporating administrative data.

A second explanation for differences between income and consumption is that consuming out of past saving or borrowing against future income allows some groups to spend more than their income, and this saving or borrowing has changed over time. For example, one possible explanation for why consumption poverty falls more than income poverty after 2000 is that low income families borrowed (or spent down assets) to maintain consumption. However, survey evidence suggests that these families simply do not have enough assets or debts to explain the

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<sup>18</sup> A similar project, the National Experimental Well-Being Statistics (NEWS) project is also ongoing at the Census Bureau (Rothbaum 2022).

differences between income and consumption. Using data from the Survey of Consumer Finances (SCF), Meyer and Sullivan (2022) show that average credit card balances for low-income households were very low—only \$624 in 2016—and most of these households (71%) had no balances. The 75th percentile of credit card debt for these households was only \$150. Furthermore, these balances have not risen noticeably since the early 1990s. In addition, these low-income households do not appear to be using other forms of debt to finance consumption. Use of payday loans, another way low-income households may have gained expanded access to credit, is also fairly limited. In 2016, only 4% of households in the bottom income quintile had taken a payday loan in the past year, which is only slightly higher than the 3% rate for 2007, which is the first year payday loan data are available in the SCF. Instead of debt, low-income families could pay for consumption by spending down assets. Here again, data from the SCF suggests this is unlikely. The 75th percentile of liquid assets for the bottom quintile households is only \$1,540 (Meyer and Sullivan, 2022, Appendix Table 6).

While dissaving does not seem to be the dominant explanation for differences between income and consumption poverty, for some families, such as those with an elderly head, dissaving is likely to be an important part of the difference between these poverty measures. About 10 to 15 percent of income poor families with a head 65 or older have substantial financial assets, suggesting that dissaving is possible for this group.

## **X. Conclusions**

Citing official poverty statistics many have concluded that the U.S. has made little progress in reducing poverty. Going further, trends in official poverty have led pundits and politicians to argue that we have lost the war on poverty—that the panoply of income support programs, from food stamps to unemployment insurance, have been ineffective anti-poverty tools. While the deficiencies in the official poverty measure have been the subject of much previous research, most poverty scholars still rely on the official measure as the definitive measure of trends in poverty and draw important conclusions based upon it.

The results presented here show that simple improvements to the official poverty measure (in particular moving to a better measure of resources and addressing bias in the CPI) as well as more complicated changes (incorporating administrative data) show poverty has improved considerably over time. There are several explanations for this progress. Poverty has been sharply reduced through tax rate cuts and tax credits. Increases in social security have played a large role in reducing poverty, but other transfers have only played a small role. Some of the decline can also be accounted for by rising educational attainment. Saving and dissaving by households is not the main reason income and consumption differ near the poverty line. A great deal of evidence suggests that under-reporting of income is a likely source of differences, but this explanation merits further examination to fully determine its importance.

Our results for consumption and improved income-based measures of poverty have different policy implications and they sharply alter what needs to be explained by researchers. Who has benefitted from economic growth or redistributive policies and who would benefit from additional targeted policies depends critically on whether one examines consumption or income.



The issues discussed here call into question how well an income-based poverty measure captures changes in disadvantage over time due to public policies and social and economic change. The official poverty resource measure that misses taxes and in-kind transfers is clearly ill-suited to analyze program effects. However, even for a more comprehensive income-based measure there are concerns due to the high and sharply increasing rate of under-reporting of government transfers in the Current Population Survey.

This paper also presents strong evidence that a well-constructed consumption-based poverty measure will be preferable to income-based measures of poverty like the official income measure and the SPM for determining the most disadvantaged. In fact, the evidence that income-based measures of poverty fail to identify the most disadvantaged raises the question as to whether a flawed measure of income, even when modified to be conceptually closer to consumption, can reliably be used to measure poverty. However, there are other uses for a poverty measure besides identifying the worst off, and given the limits on data, a consumption-based measure of poverty will work better for some of these uses than others. For example, the current sample size of the Consumer Expenditure Survey is not sufficient for useful comparisons across states or localities, though it is sufficient to provide insight into poverty nationally. Also, while a consumption-based measure of poverty may be used to set overall standards for program eligibility, given that at least some components of income, such as formal earnings and transfer income, are easier to collect and validate, income would be more appropriate for determining program eligibility for individuals or families.

Despite repeated claims of a failed war on poverty, our results show that the combination of targeted economic policies and policies that support growth has had a significant impact on poverty. Better standard headcount measures of poverty show a sharp improvement in recent decades. Going beyond traditional headcount poverty measures, consumption-based deep poverty shows even greater improvement, implying that considerable progress has been made at reducing severe deprivation. Furthermore, there has been steady improvement over the last forty years, with noticeable progress in the last two decades. We may not have won the war on poverty, but we are certainly winning.

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## Data Appendix

### A. CE and CPS Samples

Income data primarily come from the Current Population Survey Annual Social and Economic Supplement (CPS), which is the source for official measures of poverty and inequality in the U.S. This survey interviews approximately 75,000 households annually (60,000 households prior to 2002).<sup>19</sup> 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 income distribution statistics. In addition, the survey collects information on the dollar value of food stamps received by the household, as well as whether household members received other noncash benefits including housing subsidies and subsidies for reduced or free school lunch. Starting in 1980, the survey 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. We use data from the 1981-2021 surveys which provide data on income for the previous calendar year.

For our analysis of after-tax income, Federal income tax liabilities and credits and FICA taxes are calculated for all years using TAXSIM (Feenberg and Coutts 1993). State taxes and credits are also calculated using TAXSIM for the years 1977-2018. Prior to 1977 we calculate state taxes using IncTaxCalc (Bakija, 2008). We confirm that in 1977 net state tax liabilities generated using IncTaxCalc match very closely those generated using TAXSIM.<sup>20</sup>

All expenditure and consumption data come from the Interview component of the Consumer Expenditure (CE) Survey. From 1980-2011 the survey is a rotating panel that includes about 5,000 families each quarter until 1998 and about 7,500 families thereafter. Each family, or what the CE refers to as the consumer unit, reports spending on a large number of expenditure categories for up to four consecutive quarters. We use all quarterly waves from the first quarter of 1980 through the third quarter of 1981 and from 1984 through 2020 (some of the fourth quarter of 2020 data comes from surveys conducted in the first quarter of 2021). To obtain annual measures we multiply these quarterly measures by four. We do not use the data from the fourth quarter of 1981 through the fourth quarter of 1983 because the surveys for these quarters only include respondents from urban areas.

### B. Measuring Consumption and Spending in the CE

As discussed in Sections 4 and 5, the main measures of consumption presented in this paper are total consumption and well-measured consumption, but we also present inequality for subcomponents of well-measured consumption, for total consumption plus health insurance, and for expenditures. We provide more details on these measures here, and highlight how some components of these measures have changed over time.

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<sup>19</sup> The Annual Social and Economic Supplement (formerly known as the March Current Population Survey or the Annual Demographic File) is currently administered to the March sample of the Current Population Survey as well as a subsample of the respondents in the February and April surveys. Prior to reference year 2002 (survey year 2003), the supplement was only included in the March survey.

<sup>20</sup> The CPS also includes an imputed value for taxes and credits, but this information is only available starting with the 1980 survey, and the methodology for imputing taxes has changed over time.



**Expenditures:** This summary measure includes all expenditures reported in the CE Interview Survey except miscellaneous expenditures and cash contributions because some of these expenditures are not collected in all interviews. Since 1980 a subset of miscellaneous expenditures has been collected only in the fifth interview, and cash contributions are only collected in the fifth interview for surveys conducted from the first quarter of 1980 through the first quarter of 2001.

**Total Consumption:** Consumption includes all spending in our measure of total expenditures less spending on out of pocket health care expenses, education, and payments to retirement accounts, pension plans, and social security. In addition, housing and vehicle expenditures are converted to service flows. For homeowners we subtract spending on mortgage interest, property taxes, maintenance, repairs, insurance, and other expenses, and add the reported rental equivalent of the home. For years when the rental equivalent is not reported (1980-1981 surveys), we impute a value as explained below. For those in public or subsidized housing, we impute a rental value using the procedure outlined below. For vehicle owners we subtract spending on recent purchases of new and used vehicles as well vehicle finance charges. We then added the service flow value of all vehicles owned by the family, as described below.

### **B.1. Estimating Vehicle Service Flows**

Our measure of consumption replaces the purchase price of vehicles and vehicle maintenance costs with the service flow value from owned vehicles. Our improved measure of vehicle service flows follows the approach we used in Meyer and Sullivan (2012,b). Previous studies have imputed flows based only on recent spending on vehicles and descriptive characteristics of the family (Cutler and Katz 1991), recent spending on vehicles, vehicle age, and descriptive characteristics of the family (Meyer and Sullivan 2003, 2004), or reported purchase prices and vehicle age (Slesnick 1993). Our approach provides two important improvements upon previous work. First, in addition to vehicle age, our approach uses detailed information for each vehicle (such as make, model, year, automatic transmission, and other characteristics) to determine the market price. Second, we estimate depreciation rates by comparing the reported purchase prices for similar vehicles of different ages. We use the detailed expenditure data for owned vehicles from the 1980-2020 CE.

We determine a current market price for each of the 1.6 million vehicles in the data from 1980-2020 in one of three ways. First, for vehicles that were purchased within twelve months of the interview and that have a reported purchase price (the estimation sample), we take the current market price to be the reported purchase price. This estimation sample accounts for about 14 percent of all vehicles in the 1980-2018 surveys. Second, for vehicles that were purchased more than twelve months prior to the interview and that have a reported purchase price (about 15 percent of all vehicles), we specify the current market price as a function of the reported purchase price and an estimated depreciation rate as explained below.

For the remaining 71 percent of vehicles, we impute a current market price because the purchase price is not reported. Using the estimation sample, we regress the log real purchase price on a cubic in vehicle age, vehicle characteristics, family characteristics, and make-model-year fixed

effects.<sup>21</sup> The vehicle characteristics include indicators for whether the vehicle has automatic transmission, power brakes, power steering, air conditioning, a diesel engine, a sunroof, four-wheel drive, or is turbo charged. Family characteristics include log real expenditures (excluding vehicles and health), family size, region, and the age and education of the family head. Coefficient estimates from this regression are then used to calculate a predicted log real purchase price for the  $i^{\text{th}}$  vehicle ( $x_i\hat{\beta}$ ). The predicted current market value for each vehicle without a reported purchase price is then equal to  $\hat{\alpha} * \exp(x_i\hat{\beta})$ , where  $\hat{\alpha}$  is the coefficient on  $\exp(x_i\hat{\beta})$  in a regression of  $y_i$  on  $\exp(x_i\hat{\beta})$  without a constant term.<sup>22</sup>

To estimate a depreciation rate for vehicles, we compare prices across vehicles of different age, but with the same make, model, and year. In particular, from the estimation sample we construct a subsample of vehicles that are in a make-model-year cell with at least two vehicles that are not the same age. Using this sample, we regress the log real purchase price of the vehicle on vehicle age and make-model-year fixed effects.<sup>23</sup> From the coefficient on vehicle age ( $\beta$ ), we calculate the depreciation rate ( $\delta$ ):  $\delta = 1 - EXP(\beta)$ . The service flow is then the product of this depreciation rate and the current market price. If the vehicle has a reported purchase price but was not purchased within 12 months of the interview we calculate the service flow as: (real reported purchase price)\* $\delta(1 - \delta)^t$ , where  $t$  is the number of years since the car was purchased.

We validate our procedure for predicting the current market value of vehicles for those observations where we do not have a purchase price by comparing the predicted values to published values in National Automobile Dealers Association (NADA) guides. For a given year of the CE we take a random sample of 100 vehicles for which a purchase price was not observed. We then find the average retail price of the vehicle reported in the NADA Official Used Car Guide, using observable vehicle characteristics including make, model, year, number of cylinders, and number of doors. In cases where a unique match is not found in the NADA guide (for example, there might be multiple sub-models listed in the NADA guide), we use the midpoint of the range of prices for the vehicles that match the description of the vehicle from the CE. For the sample of vehicles randomly drawn from the 2000 CE, the correlation between our imputed price and the 2000 NADA price was 0.88. Similarly, for a sample of 100 cars with a reported purchase price, the correlation between the reported price and the NADA price was 0.91.

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<sup>21</sup> 76 percent of the vehicles without a reported purchase price can be matched to at least one vehicle in the estimation sample with the same make, model, and year, and 69 percent of the remaining 24 percent do not have a match because they are not a car, truck, or van so make and model are not observed. Starting in 2006, vehicles can be matched on make, but not model, because the CE stopped providing information on vehicle model after 2005. For those vehicles without a reported purchase price that do not have the same make, model, and year as at least one vehicle in the estimation sample, but do have the same make and year as a vehicle in the estimation sample, a separate regression is estimated that includes make-year fixed effects instead of make-model-year fixed effects.

<sup>22</sup> This adjustment is made because  $\exp(x_i\hat{\beta})$  will tend to underestimate  $y_i$ .

<sup>23</sup> The distribution of service flows does not differ noticeably when alternative specifications for depreciation are estimated. For example, specifications that allow the depreciation rate to vary by age of the vehicle (by including a cubic in vehicle age in the regression) yield similar results.

## **B.2. Estimating a Rental Equivalent for Families Living in Government or Subsidized Housing**

We impute a rental equivalent for families in the CE living in government or subsidized housing 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 who are not in public or subsidized housing we estimate quantile regressions for log rent using the CE 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 (to account for changes over time in their price and quality). We then 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. We use the 40th percentile because public housing tends to be of lower quality than private housing in dimensions we do not directly observe. Evidence from the PSID indicates that the average reported rental equivalent of public or subsidized housing is just under the predicted 40th percentile for these units using parameters estimated from those outside public or subsidized housing.

## **B.3. Estimating the Value of Health Insurance**

We impute a measure of the value of public and private health insurance using the coverage information in the CE and data on insurance costs. The worker and firm cost of employer provided insurance is obtained from a combination of sources including the National Medical Care Expenditure Survey and the Mercer/Foster Higgins National Survey of Employer Sponsored Health Plans. From these surveys we calculate a cost of employer provided health insurance that varies by year and nine geographic regions. The cost of Medicaid and Medicare is taken from expenditures per person in a given state and year. For Medicaid we calculate these expenditures separately for children, adults under 65, and adults 65 and over.

The value a family places on health coverage may exceed its cost because of its insurance value. On the other hand, this in-kind transfer may be valued at much less than cost given the one size fits all nature of insurance and the lower value of purchases of most goods by the poor. The compromise that we consider here is to count desired health expenditures. Assuming that desired health expenditures by those with few resources can be characterized by Cobb-Douglas preferences with a coefficient of 0.33 on health and 0.67 on other goods, only health expenditures up to one-third of total expenditures are included. This compromise values health coverage at cost for those with substantial resources as they likely spend less than one-third of consumption on health, but at much less than cost for those with few other resources. Because information on health insurance coverage is not available from 1984 to 1987, we do not report consumption measures that include health insurance for these years.

## **B.4. Imputing Rental Equivalent**

In survey years 1980-81 we do not observe the reported rental equivalent of the home. To construct an imputed value of housing consumption for homeowners for these years, we rely on data from subsequent waves of the CE Survey where rental equivalent is reported. Using data

from 1984, for example, we estimate the relationship between reported rental equivalent and the reported house value and other characteristics. Specifically, for a sample of homeowners we estimate quantile regressions of the following form:

$$(A.1) \quad Q_{\alpha}(\ln rent_i) = \beta_1 \ln hval_i + \beta_2 \ln nh_i + \beta_3 X_i + \beta_4 W_i,$$

where  $rent_i$  denotes the reported rental equivalent for consumer unit  $i$ ;  $hval_i$  is the reported market value of the home;  $nh_i$  is total non-housing consumption;  $X_i$  is a vector of characteristics including age and education of the head, family size, and family type (single parent, married parents, single individual, and other); and  $W_i$  is a vector of living unit characteristics including whether the unit has central or window air conditioning, the number of rooms and whether the unit is located within a SMSA. We then use the coefficient estimates of Equation A.1 to predict the  $\alpha$  quantile of rental equivalent for consumer units in the 1980-81 surveys. We estimate Equation A.1 for 99 different percentiles, yielding 99 predicted values of rental equivalent for each homeowner. For non-homeowners in 1980-81 we generate 99 duplicate observations. Stacking these two datasets together yields a sample with 99 X N consumer units, where N is the number of consumer units in the 1980-81 data.

We calculate our various consumption measures for this expanded 99 X N sample using predicted rental equivalent as our measure of service flow from owned homes. Our measures of consumption inequality are then calculated for the various measures of consumption using this expanded 99 X N sample. When predicting within sample (i.e. when the estimation and prediction samples are the same) the distribution of predicted rental equivalent lines up very closely with the actual reported rental equivalent.

## B.5. Comparability over Time

We make minor adjustments to the measure of total expenditures provided in the CE to maintain a comparable definition of expenditures across our sample period. In particular, the wording for the question regarding spending on food at home in surveys conducted between 1982 and 1987 differed from other years. Several studies have noted that this wording change resulted in a decrease in reported spending on food at home (Battistin 2003; Browning et al. 2003). To correct for the effect of this change in the questionnaire, for the years 1984-1987 we multiply spending on food at home by an adjustment factor which is equal to the ratio of average spending on food at home from 1988 through 1990 to average spending on food at home from 1984 through 1987. These adjustment factors, which we estimate separately for different family types, range from 1.12 to 1.30. Starting with the second quarter of 2007, the question on food away from home changed from a query about usual monthly spending to usual weekly spending. This change resulted in a noticeable increase in reported food away spending. We estimate the effect of the question change by regressing food away spending on a new question indicator, controlling for interview month and reference month (respondents report spending for the previous three months) for survey years 2005 through 2007. Based on these estimates we adjust spending on food away down by 55 percent for the most recent years. This adjustment does not affect our well-measured consumption measure because this measure excludes food away.

Reported food away spending is a small fraction of total spending, accounting for about 6 percent of total spending for all consumer units in 2018.<sup>24</sup>

The values for certain spending components are top coded in the public use files, and the threshold values for the top code changes over time. For example, the top code threshold for the monthly rental equivalent value of an owned home increased from \$1,000 in 1988 to \$1,500 in 1989. Over longer periods the real values of the top code thresholds have typically risen. For example, the value of the rental equivalent threshold in 2014 (\$3,900) is 37% greater in real terms than the value of this threshold in 1980 (\$1,000).

Also, we do not observe whether a consumer unit resides in public or subsidized housing prior to 1982, so a rental equivalent value for those in such housing is not included in consumption prior to 1982. Estimates of the rental equivalent for those in public or subsidized housing in the mid-1980s are small relative to total consumption, suggesting that this exclusion is not likely to significantly bias our estimates for changes in inequality. Finally, the availability of information on vehicles also changes during our sample period as we noted above.

### C. Measures of Income in the CPS

CPS respondents report annual measures of money income for the previous calendar year. Respondents also report the dollar value of food stamps received by the household, as well as whether household members received other noncash benefits including housing subsidies and subsidies for reduced or free school lunch. Starting with the 1980 survey, the Census also provides imputed values for these and other noncash benefits.

The income inequality results reported in this study focus on three main measures of income: Pre-Tax Money, After-Tax Money Income, and After-Tax Money Income Plus Noncash Benefits. We also examined alternative income-based measures of resources that include the imputed value of Medicaid and Medicare, employer health benefits, and the net return on housing equity. These measures of income are defined as follows:

**Pre-Tax Money Income:** The Census definition of money income that is used to measure poverty and inequality. This definition of income, as reported in the ASEC codebook, includes: 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.

**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. The federal and state tax liabilities and credits and FICA taxes are calculated for all years using TAXSIM (Feenberg and Coutts 1993).

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<sup>24</sup> <https://www.bls.gov/cex/tables.htm#avgexp>.

**After-tax Money Income Plus Noncash Benefits:** this adds to After-Tax Money Income the face value of food stamps, and imputed values for housing subsidies and the school lunch program.

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

**Income Value of School Lunch Program:** The Census 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.

**Housing Subsidies:** Instead of using the CPS-imputed housing subsidy values that are no longer available since the survey year 2016, we use our own method to impute housing subsidy values. Specifically, we calculate the value of housing subsidies as the difference between Fair Market Rent (FMR), which varies across metropolitan areas and the number of bedrooms, and the required rent payment. We obtained the historical FMR data for the years 1983, 1985-2020 from the HUD website. For 1984, we linearly interpolate estimates using the FMR in 1983 and 1985. For years 1980-1982, we use the 1983 FMR but adjusting for inflation using the bias-corrected CPI-U-RS. Since the CPS does not contain information about the number of bedrooms, we assign the number of bedrooms based on the household size following the HUD guidelines. For instance, we assign one bedroom to two-person households and two bedrooms to three- or four-person households. For households with two children of both sexes, we assign one more bedroom. We then merge observations from the CPS data with the FMR data using the Metropolitan Statistical Area (MSA) or county code. For observations with missing MSA/county code, we assign the state average FMR. We estimate rent payment as 30% adjusted income (income after deductions). To calculate deductions, we use information on the number of children and whether a household has an elderly member (age $\geq$ 62). We find that our estimates on the average value of housing subsidies per unit-month are comparable to the average federal spending per unit-month in 2010 and 2020.

Table 1  
Mean Characteristics of the Official, SPM, and Consumption Poor, CE Survey, 2020

	Official Income	SPM Poor	Consumption
	Poor		Poor
	(1)	(2)	(3)
Consumption	\$39,735	\$42,841	\$22,175
Head Employed	45%	45%	61%
Number of Earners	0.79	0.85	1.54
Any health insurance	75%	74%	66%
Private health insurance	25%	36%	28%
Homeowner	43%	53%	36%
Single family home	35%	44%	30%
Own a car	73%	79%	77%
Service flows from vehicles	\$565	\$ 722	\$342
Service flows from owned homes	\$3,602	\$ 4,833	\$1,306
Total service flows	\$4,168	\$ 5,555	\$1,648
Family size	3.42	3.35	4.48
# of children	1.51	1.28	1.83
# over 64	0.29	0.38	0.32
# of rooms	6.50	6.78	5.36
# of Bedrooms	3.27	3.41	2.74
# of Bathrooms	1.93	2.01	1.43
Appliances and Amenities*			
Microwave	90%	91%	86%
Disposal	34%	37%	28%
Dishwasher	42%	46%	32%
Any Air Conditioning	75%	76%	68%
Central Air Conditioning	46%	49%	39%
Washer	66%	71%	67%
Dryer	60%	65%	57%
Television	95%	95%	91%
Computer	66%	68%	61%
Education of Head			
Less Than High School	25%	22%	31%
High School Degree	33%	31%	35%
Some College	30%	31%	26%
College Graduate	12%	16%	8%
Race of Head			
White	69%	71%	75%
Black	25%	24%	18%
Asian	3%	3%	4%
Other	3%	2%	2%
Hispanic Origin	27%	25%	32%
Family Type			
Single Parent Families	29%	28%	25%
Married Parent Families	26%	24%	39%
Single Individuals	19%	16%	12%
Married without Children	8%	10%	8%
Head 65 and Over	18%	23%	15%
Total Financial Assets			
75th Percentile	\$400	\$ 780	\$300
90th Percentile	\$2,500	\$ 4,000	\$3,000
Unweighted Number of Families	1,874	1,775	1,190

Notes: The official income and consumption poverty measures are anchored to the SPM poverty rate for this sample, or 9.1%. Consumption poverty is calculated using the 3-parameter equivalence scale. Rooms and total consumption are equivalence-scale adjusted and equivalized to a family with 2 adults and 2 children. All characteristics are for the family but are weighted by family size. \*Results are based on the 2012 CE data because most appliances variables are unavailable since 2013.

Table 2: Consumption and Income Poverty by Family Type, 1980-2020 (Thresholds Anchored in 2000)

Year	Single Parent Families		Married Parent Families		Single Individuals		Married without Children		Head 65 and Over	
	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1980	0.547	0.470	0.189	0.175	0.224	0.186	0.076	0.071	0.313	0.303
1981	0.552	0.459	0.209	0.175	0.251	0.181	0.089	0.072	0.299	0.291
1982	0.597		0.219		0.245		0.103		0.284	
1983	0.577		0.226		0.249		0.094		0.265	
1984	0.555	0.428	0.205	0.190	0.234	0.178	0.093	0.063	0.241	0.211
1985	0.533	0.394	0.196	0.169	0.223	0.183	0.091	0.067	0.233	0.232
1986	0.537	0.454	0.174	0.168	0.217	0.154	0.075	0.070	0.223	0.200
1987	0.492	0.447	0.159	0.164	0.208	0.144	0.070	0.064	0.207	0.192
1988	0.468	0.447	0.146	0.166	0.194	0.128	0.067	0.057	0.200	0.190
1989	0.455	0.399	0.145	0.154	0.182	0.109	0.064	0.059	0.189	0.173
1990	0.456	0.407	0.151	0.167	0.188	0.145	0.064	0.057	0.183	0.171
1991	0.458	0.425	0.148	0.168	0.190	0.137	0.063	0.057	0.180	0.165
1992	0.456	0.415	0.145	0.173	0.192	0.137	0.066	0.059	0.185	0.150
1993	0.444	0.381	0.143	0.158	0.196	0.131	0.071	0.056	0.175	0.149
1994	0.402	0.354	0.123	0.144	0.196	0.122	0.065	0.061	0.158	0.133
1995	0.358	0.343	0.107	0.150	0.185	0.123	0.059	0.042	0.144	0.130
1996	0.350	0.362	0.104	0.141	0.179	0.110	0.058	0.046	0.143	0.116
1997	0.343	0.308	0.090	0.123	0.178	0.104	0.054	0.042	0.134	0.099
1998	0.307	0.286	0.084	0.123	0.166	0.103	0.047	0.041	0.129	0.081
1999	0.280	0.264	0.074	0.121	0.162	0.114	0.052	0.039	0.119	0.096
2000	0.274	0.247	0.073	0.112	0.152	0.109	0.051	0.038	0.123	0.094
2001	0.270	0.271	0.067	0.098	0.156	0.105	0.055	0.035	0.115	0.081
2002	0.250	0.248	0.069	0.093	0.162	0.108	0.051	0.034	0.123	0.077
2003	0.268	0.253	0.067	0.103	0.162	0.100	0.053	0.041	0.114	0.080
2004	0.257	0.220	0.066	0.097	0.166	0.091	0.057	0.039	0.115	0.067
2005	0.261	0.186	0.061	0.086	0.165	0.096	0.051	0.031	0.112	0.072
2006	0.254	0.171	0.058	0.081	0.161	0.073	0.047	0.032	0.101	0.074
2007	0.251	0.165	0.059	0.069	0.155	0.069	0.044	0.032	0.101	0.054
2008	0.249	0.161	0.063	0.064	0.164	0.072	0.050	0.021	0.101	0.048
2009	0.238	0.177	0.059	0.073	0.168	0.085	0.047	0.024	0.086	0.044
2010	0.252	0.162	0.060	0.084	0.172	0.084	0.051	0.029	0.090	0.061
2011	0.244	0.165	0.059	0.078	0.177	0.073	0.055	0.029	0.078	0.060
2012	0.247	0.169	0.061	0.081	0.174	0.068	0.054	0.027	0.084	0.050
2013	0.235	0.180	0.049	0.070	0.178	0.075	0.056	0.025	0.086	0.049
2014	0.237	0.166	0.051	0.066	0.173	0.073	0.054	0.028	0.088	0.056
2015	0.218	0.129	0.045	0.065	0.155	0.067	0.044	0.023	0.074	0.042
2016	0.208	0.119	0.041	0.057	0.145	0.060	0.044	0.015	0.078	0.043
2017	0.198	0.127	0.040	0.057	0.149	0.061	0.037	0.017	0.078	0.035
2018	0.173	0.102	0.031	0.053	0.141	0.067	0.037	0.011	0.080	0.033
2019	0.166	0.100	0.028	0.035	0.122	0.054	0.029	0.008	0.070	0.033
2020	0.145	0.070	0.022	0.032	0.108	0.028	0.025	0.012	0.053	0.023
Change:										
1980 - 1990	-0.091	-0.062	-0.039	-0.008	-0.036	-0.041	-0.012	-0.014	-0.130	-0.132
1990 - 2000	-0.182	-0.161	-0.078	-0.055	-0.035	-0.036	-0.013	-0.019	-0.059	-0.077
2000 - 2020	-0.129	-0.177	-0.050	-0.080	-0.045	-0.081	-0.027	-0.026	-0.070	-0.071
1980 - 2020	-0.401	-0.399	-0.167	-0.143	-0.116	-0.158	-0.051	-0.059	-0.260	-0.280

Notes: Poverty status is determined at the family level and then person weighted. The thresholds are anchored in 2000, and they are anchored for the full sample, rather than for each demographic group. Thresholds are adjusted over time using the bias-corrected CPI-U-RS. Consumption data are from the CE and income data are from the CPS-ASEC/ADF. Each series is adjusted using the NAS recommend equivalence scale.



Table 3: Consumption and Income Poverty by Age Group, 1980-2020 (Thresholds Anchored in 2000)

Year	Age 0-17		Age 18-64		Age 65+	
	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption
	(1)	(2)	(3)	(4)	(5)	(6)
1980	0.294	0.254	0.179	0.162	0.309	0.279
1981	0.318	0.250	0.195	0.162	0.292	0.265
1982	0.334		0.204		0.278	
1983	0.338		0.204		0.255	
1984	0.318	0.256	0.191	0.161	0.233	0.200
1985	0.305	0.243	0.184	0.155	0.225	0.200
1986	0.291	0.251	0.170	0.153	0.214	0.189
1987	0.269	0.254	0.157	0.148	0.200	0.168
1988	0.252	0.254	0.148	0.147	0.194	0.161
1989	0.249	0.235	0.144	0.129	0.183	0.158
1990	0.255	0.248	0.147	0.144	0.180	0.153
1991	0.255	0.247	0.149	0.144	0.175	0.151
1992	0.254	0.258	0.150	0.150	0.177	0.132
1993	0.252	0.237	0.150	0.136	0.169	0.135
1994	0.226	0.217	0.137	0.129	0.150	0.119
1995	0.201	0.216	0.126	0.129	0.139	0.115
1996	0.196	0.221	0.123	0.122	0.138	0.101
1997	0.183	0.187	0.116	0.109	0.124	0.089
1998	0.169	0.178	0.107	0.104	0.120	0.073
1999	0.147	0.174	0.102	0.105	0.113	0.078
2000	0.147	0.164	0.098	0.098	0.119	0.077
2001	0.141	0.157	0.098	0.095	0.111	0.069
2002	0.136	0.144	0.099	0.093	0.116	0.066
2003	0.142	0.156	0.100	0.095	0.107	0.067
2004	0.138	0.139	0.103	0.087	0.105	0.055
2005	0.136	0.121	0.099	0.081	0.104	0.060
2006	0.129	0.119	0.096	0.072	0.096	0.054
2007	0.130	0.104	0.095	0.064	0.096	0.050
2008	0.133	0.095	0.099	0.060	0.093	0.047
2009	0.125	0.109	0.099	0.069	0.081	0.038
2010	0.132	0.115	0.104	0.075	0.083	0.046
2011	0.129	0.112	0.106	0.070	0.073	0.044
2012	0.133	0.115	0.106	0.068	0.077	0.041
2013	0.118	0.111	0.104	0.069	0.080	0.038
2014	0.122	0.107	0.102	0.067	0.082	0.040
2015	0.112	0.095	0.091	0.057	0.069	0.034
2016	0.106	0.081	0.085	0.051	0.074	0.037
2017	0.103	0.077	0.083	0.053	0.073	0.031
2018	0.084	0.074	0.076	0.047	0.076	0.023
2019	0.078	0.059	0.066	0.038	0.068	0.023
2020	0.070	0.047	0.058	0.028	0.052	0.022
Change:						
1980 - 1990	-0.038	-0.007	-0.032	-0.018	-0.130	-0.126
1990 - 2000	-0.108	-0.083	-0.050	-0.046	-0.061	-0.076
2000 - 2020	-0.076	-0.117	-0.040	-0.071	-0.067	-0.055
1980 - 2020	-0.223	-0.207	-0.121	-0.135	-0.257	-0.257

Notes: Poverty status is determined at the family level and then person weighted. The thresholds are anchored in 2000, and they are anchored for the full sample, rather than for each age group. Thresholds are adjusted over time using the bias-corrected CPI-U-RS. Consumption data are from the CE and income data are from the CPS-ASEC/ADF. Each series is adjusted using the NAS recommend equivalence scale.

Table 4: Consumption and Income Poverty by Racial Group, 1980-2020 (Thresholds Anchored in 2000)

Year	Race: White		Race: Black		Race: Other		Ethnicity: Hispanic		Ethnicity: Non-Hispanic	
	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption	After-Tax Income plus NC benefit	Total Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1980	0.194	0.160	0.444	0.438	0.282	0.373	0.384	0.415	0.211	0.187
1981	0.206	0.154	0.467	0.467	0.293	0.296	0.395	0.407	0.226	0.185
1982	0.212		0.488		0.309		0.413		0.233	
1983	0.211		0.475		0.314		0.415		0.231	
1984	0.198	0.156	0.449	0.445	0.262	0.229	0.389	0.435	0.214	0.172
1985	0.190	0.146	0.429	0.446	0.254	0.257	0.399	0.408	0.202	0.166
1986	0.177	0.151	0.412	0.426	0.240	0.174	0.380	0.373	0.189	0.170
1987	0.161	0.140	0.389	0.454	0.245	0.206	0.372	0.345	0.173	0.167
1988	0.151	0.137	0.368	0.444	0.243	0.215	0.339	0.370	0.165	0.161
1989	0.148	0.131	0.356	0.380	0.207	0.160	0.345	0.358	0.158	0.145
1990	0.152	0.138	0.362	0.397	0.198	0.244	0.351	0.344	0.161	0.158
1991	0.152	0.135	0.357	0.420	0.213	0.231	0.343	0.340	0.162	0.156
1992	0.152	0.140	0.361	0.412	0.217	0.231	0.339	0.353	0.161	0.159
1993	0.152	0.132	0.348	0.364	0.220	0.225	0.346	0.359	0.159	0.143
1994	0.139	0.123	0.294	0.338	0.228	0.200	0.333	0.319	0.142	0.133
1995	0.126	0.125	0.272	0.310	0.191	0.183	0.308	0.342	0.127	0.128
1996	0.124	0.114	0.262	0.323	0.178	0.209	0.292	0.322	0.124	0.124
1997	0.116	0.104	0.244	0.270	0.163	0.137	0.264	0.281	0.117	0.108
1998	0.107	0.096	0.232	0.254	0.144	0.170	0.242	0.289	0.108	0.100
1999	0.100	0.097	0.198	0.246	0.142	0.175	0.210	0.279	0.101	0.099
2000	0.099	0.096	0.199	0.215	0.121	0.118	0.209	0.281	0.097	0.091
2001	0.096	0.091	0.197	0.214	0.126	0.121	0.194	0.255	0.096	0.089
2002	0.097	0.085	0.194	0.215	0.117	0.105	0.195	0.232	0.097	0.084
2003	0.097	0.091	0.196	0.217	0.126	0.098	0.198	0.242	0.098	0.086
2004	0.098	0.080	0.198	0.201	0.115	0.100	0.186	0.208	0.099	0.077
2005	0.094	0.076	0.195	0.170	0.120	0.089	0.182	0.184	0.096	0.072
2006	0.091	0.071	0.180	0.159	0.119	0.066	0.172	0.178	0.092	0.064
2007	0.091	0.062	0.179	0.150	0.112	0.049	0.170	0.146	0.091	0.059
2008	0.094	0.059	0.179	0.130	0.124	0.050	0.181	0.138	0.093	0.054
2009	0.091	0.062	0.166	0.159	0.119	0.074	0.171	0.131	0.090	0.064
2010	0.096	0.073	0.176	0.136	0.118	0.076	0.179	0.165	0.095	0.064
2011	0.095	0.071	0.175	0.127	0.118	0.066	0.171	0.147	0.094	0.063
2012	0.094	0.069	0.182	0.123	0.125	0.067	0.173	0.156	0.095	0.060
2013	0.092	0.062	0.173	0.148	0.108	0.080	0.158	0.141	0.093	0.061
2014	0.092	0.062	0.167	0.130	0.110	0.084	0.154	0.125	0.093	0.062
2015	0.081	0.058	0.150	0.092	0.103	0.063	0.131	0.098	0.084	0.056
2016	0.079	0.050	0.140	0.096	0.093	0.051	0.122	0.095	0.081	0.047
2017	0.077	0.052	0.135	0.094	0.088	0.032	0.115	0.096	0.079	0.047
2018	0.069	0.047	0.122	0.072	0.089	0.046	0.099	0.083	0.073	0.043
2019	0.061	0.036	0.112	0.068	0.073	0.036	0.093	0.055	0.064	0.037
2020	0.054	0.029	0.092	0.045	0.058	0.034	0.080	0.049	0.055	0.027
Change:										
1980 - 1990	-0.042	-0.021	-0.082	-0.041	-0.085	-0.129	-0.033	-0.071	-0.050	-0.029
1990 - 2000	-0.053	-0.042	-0.163	-0.182	-0.076	-0.127	-0.142	-0.063	-0.064	-0.067
2000 - 2020	-0.045	-0.068	-0.107	-0.170	-0.063	-0.083	-0.129	-0.232	-0.041	-0.064
1980 - 2020	-0.139	-0.131	-0.352	-0.393	-0.224	-0.339	-0.305	-0.366	-0.156	-0.160

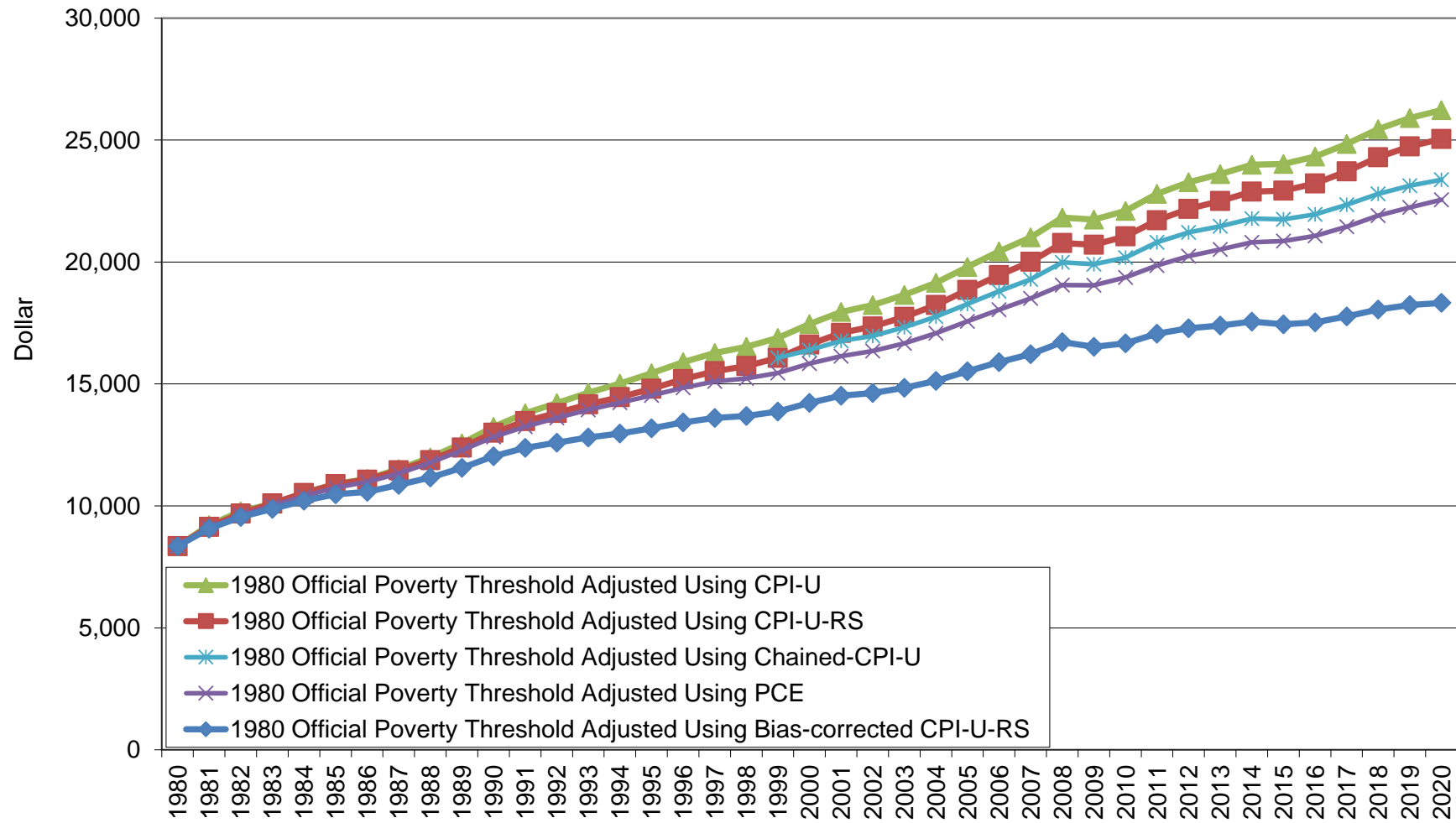
Notes: Poverty status is determined at the family level and then person weighted. The thresholds are anchored in 2000, and they are anchored for the full sample, rather than for each racial group. Thresholds are adjusted over time using the bias-corrected CPI-U-RS. Consumption data are from the CE and income data are from the CPS-ASEC/ADF. Each series is adjusted using the NAS recommend equivalence scale.

Table 5: The Effect of Changes in Demographic Characteristics on Changes in Poverty, 1980-2020

	1980	1990	2000	2010	2020	Change 1980-2020
<b>A. Consumption Poverty</b>						
Actual Poverty	0.130	0.108	0.061	0.044	0.014	-0.116
Predicted poverty holding within group poverty at 1980 rate						
Changes in family type	0.130	0.138	0.140	0.144	0.146	0.016
Changes in family type and education	0.130	0.121	0.109	0.108	0.090	-0.040
Changes in family type and race	0.130	0.140	0.152	0.166	0.174	0.044
Changes in family type, education, and employment	0.130	0.123	0.110	0.118	0.094	-0.036
<b>B. After-tax Income Poverty</b>						
Actual Poverty	0.130	0.114	0.072	0.084	0.051	-0.079
Predicted poverty holding within group poverty at 1980 rate						
Changes in family type	0.130	0.136	0.140	0.145	0.145	0.015
Changes in family type and education	0.130	0.121	0.114	0.109	0.096	-0.034
Changes in family type and race	0.130	0.141	0.151	0.162	0.168	0.039
Changes in family type, education, and employment	0.130	0.122	0.116	0.127	0.108	-0.022

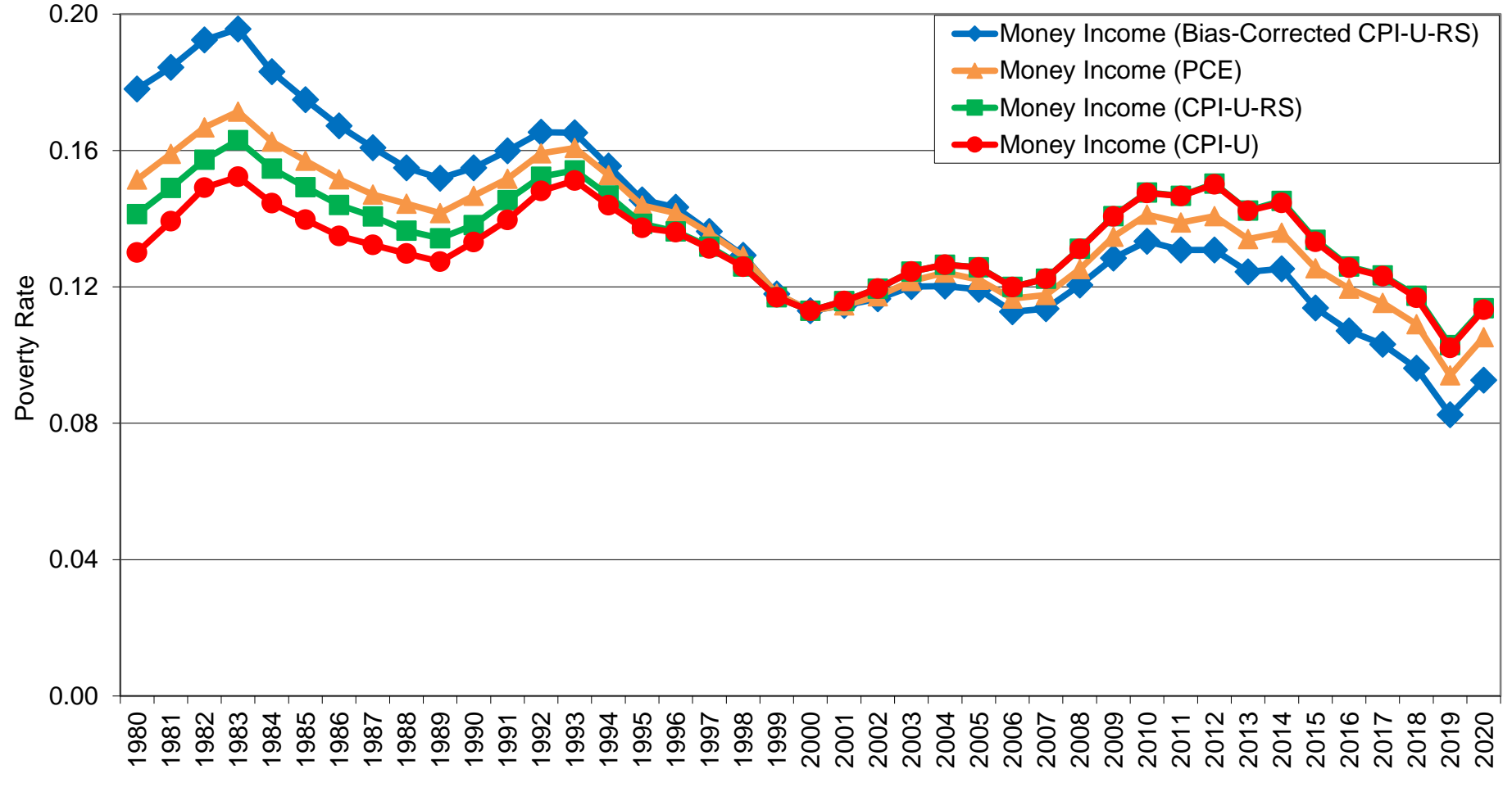
Notes: Predicted poverty is the weighted average of the poverty rates for each group in the base year using as weights the distribution across groups in the year listed in the column headings.

Figure 1: 1980 Official Poverty Thresholds for Two Adults and Two Children Families Adjusted Using Different Price Index



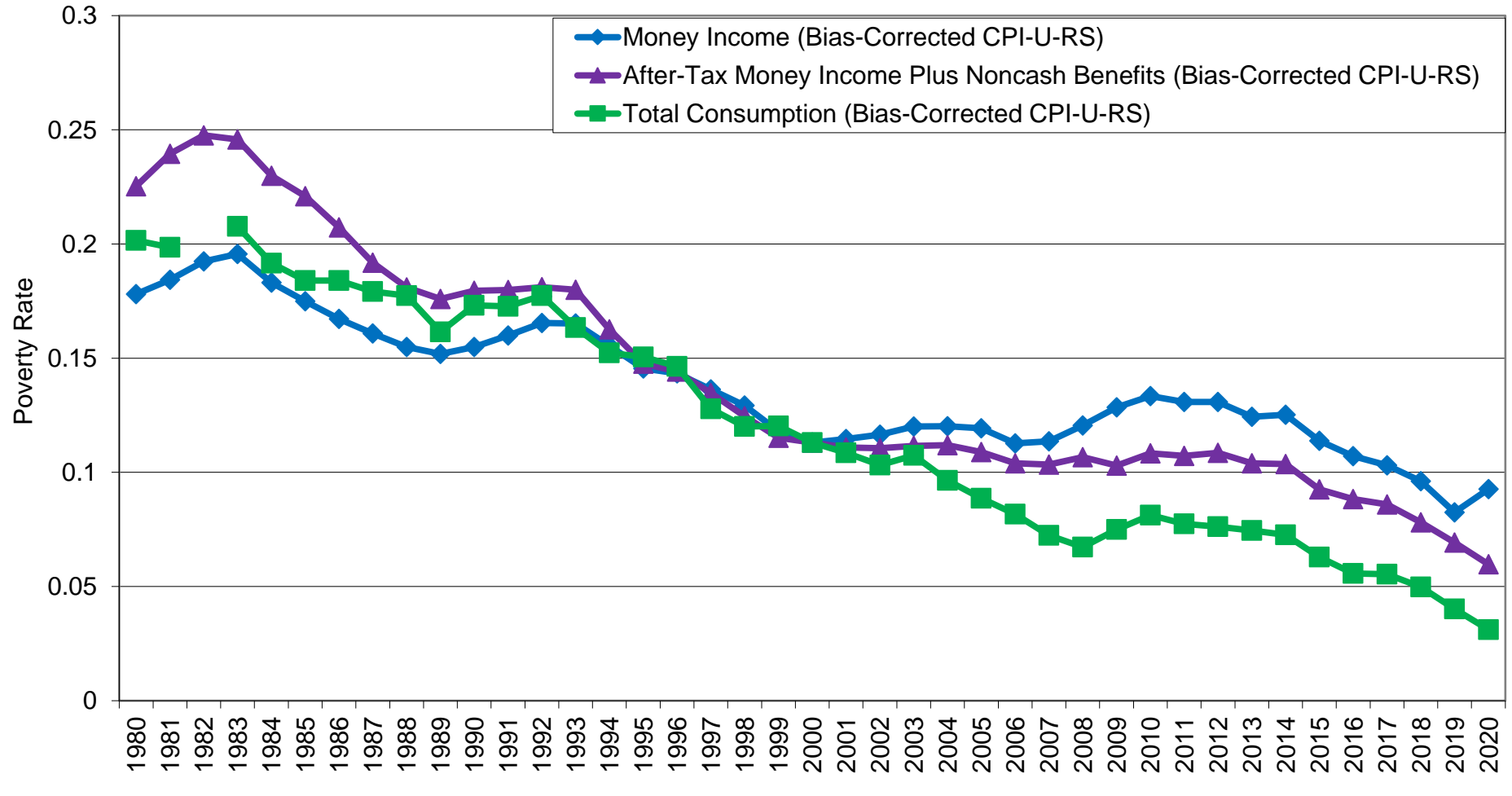
Notes: Poverty thresholds are from <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>. Chained-CPI-U index is from <https://www.bls.gov/cpi/data.htm>. Chained-CPI-U index goes back to the year 1999. We impute Chained-CPI-U index for years before 1999 using Bias-corrected CPI-U-RS index in the corresponding years.

Figure 2: Money Income Poverty Rates Using Four Different Price Deflators, 1980-2020, Thresholds Anchored in 2000



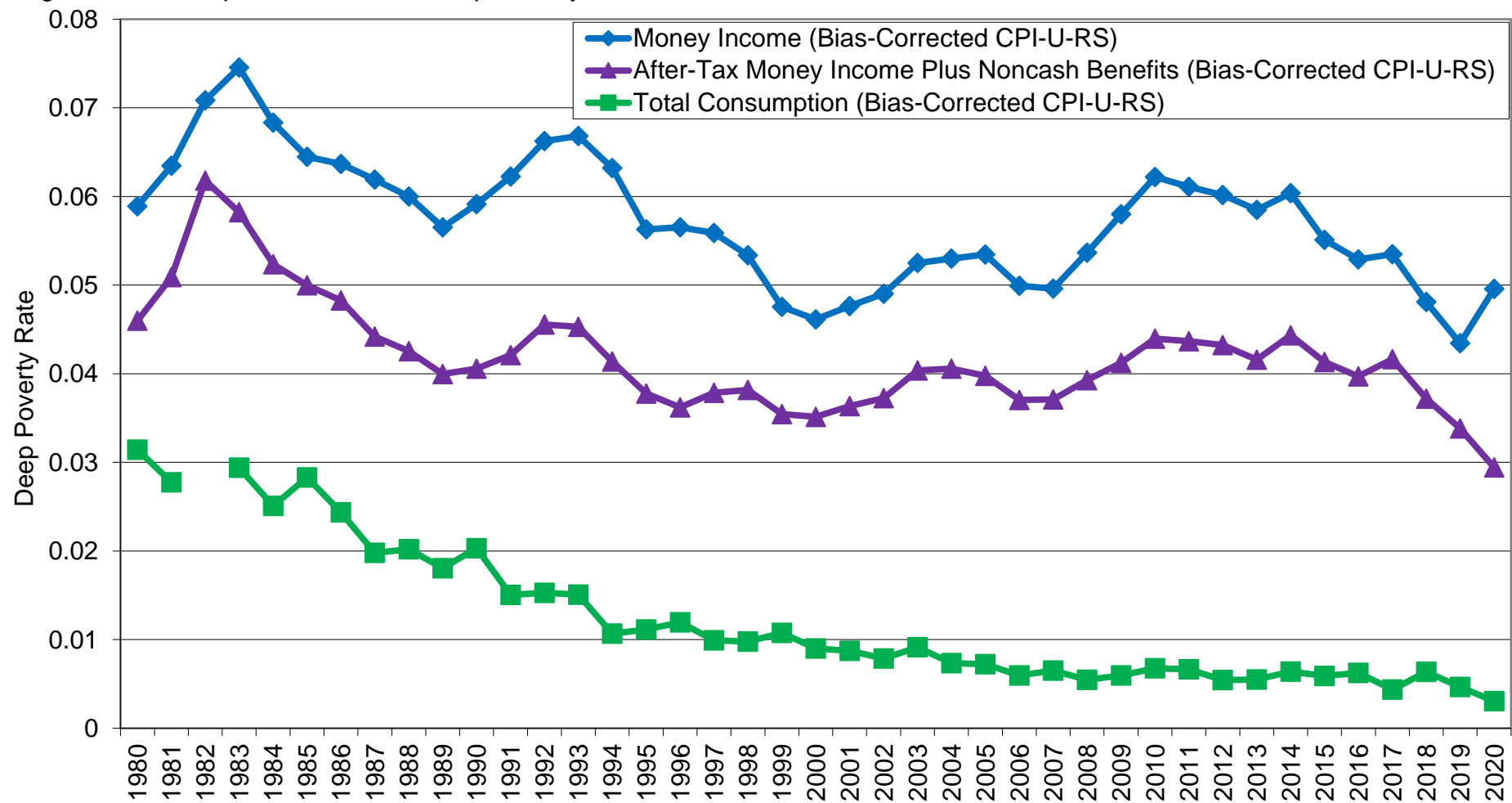
Notes: Data are from the CPS-ASEC/ADF. Money Income is the same resource measure used in the official poverty measure. For each measure the threshold in 2000 is equal to the value that yields a poverty rate equal to the official poverty rate in 2000 (11.3 percent). The thresholds in 2000 are then adjusted over time using one of four price deflators. Poverty status is determined at the family level and then person weighted. All measures use the NAS equivalence scale to account for differences in family size.

Figure 3: Consumption and Income Poverty Rates, 1980-2020, Thresholds Anchored in 2000



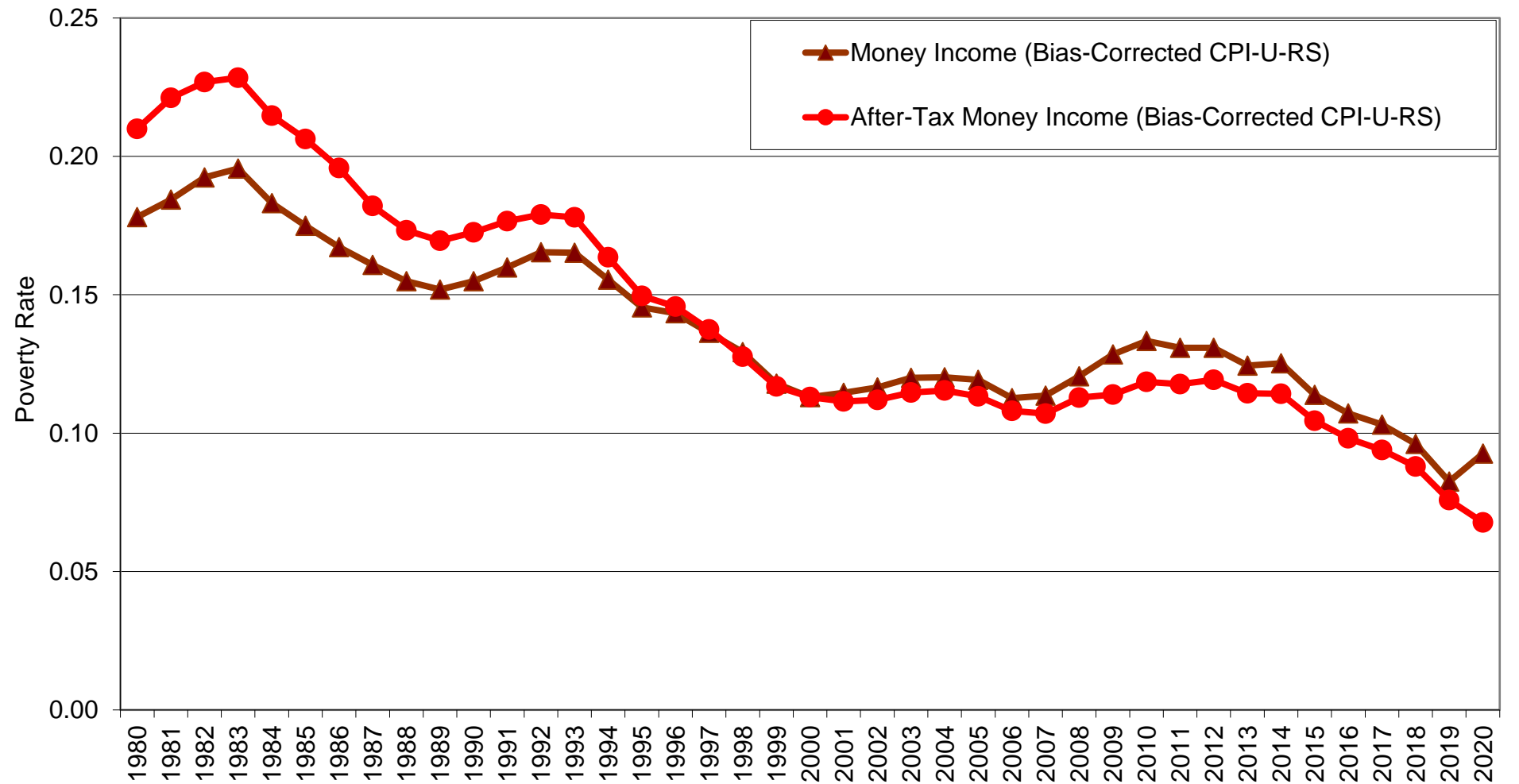
Notes: Income data are from the CPS-ASEC/ADF, Consumption data are from the CE Survey. After-Tax Money Income Plus Noncash Benefits includes taxes and credits, food stamps, and CPS-imputed measures of school lunch subsidies. See notes to Figure 2 for more details.

Figure 4: Consumption and Income Deep Poverty Rates, 1980-2020, Thresholds Anchored in 2000



Notes: The deep poverty threshold in 2000 is set to 50 percent of the poverty thresholds used in Figure 2. The thresholds in 2000 are then adjusted over time using the bias-corrected CPI-U-RS. See notes to Figure 2 for more details.

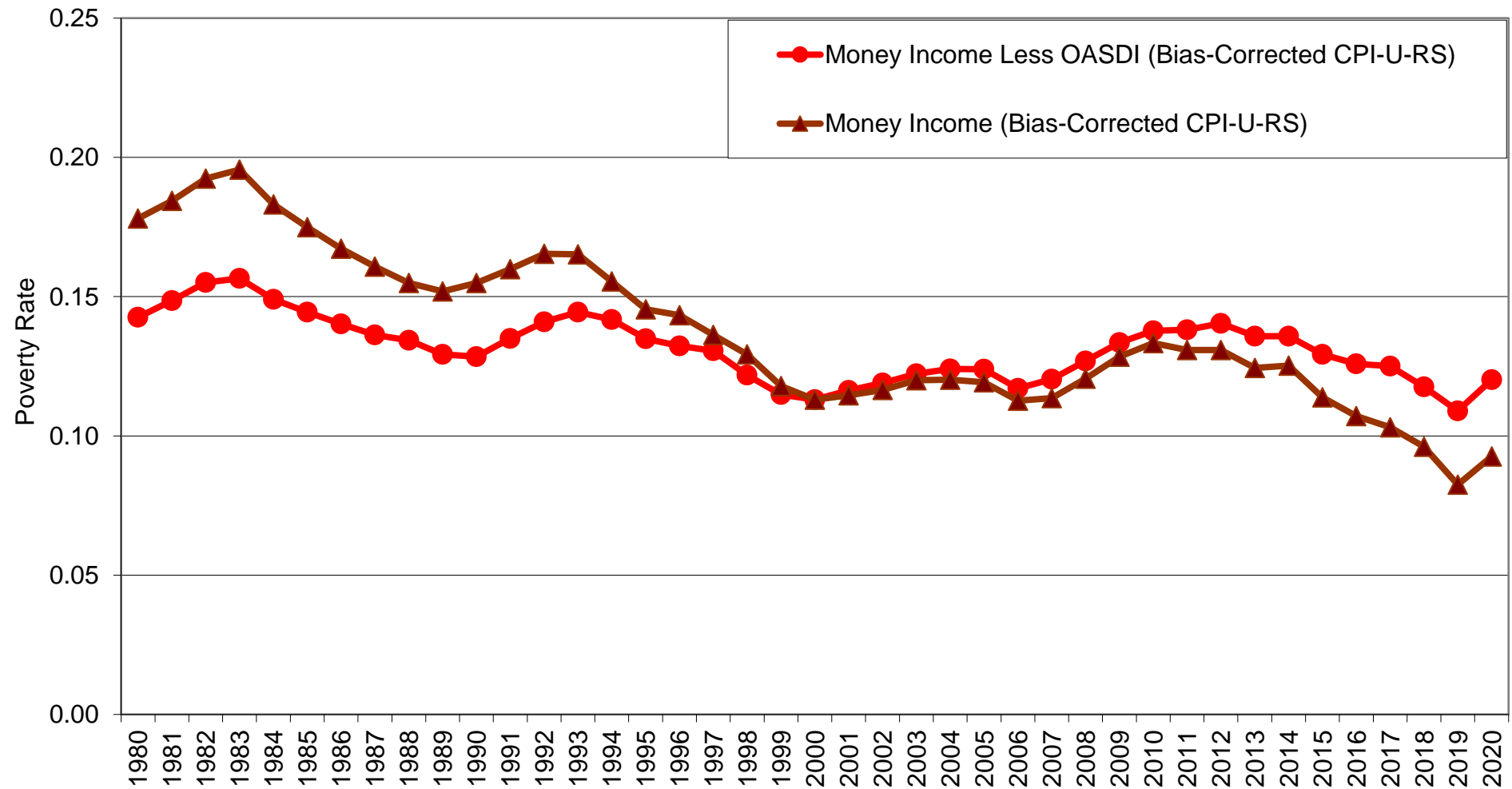
Figure 5: The Effect of Taxes on Changes in Poverty, Thresholds Anchored in 2000



Notes: After-Tax Money Income includes taxes and credits (calculated using TAXSIM). See notes to Figure 2 for more details.

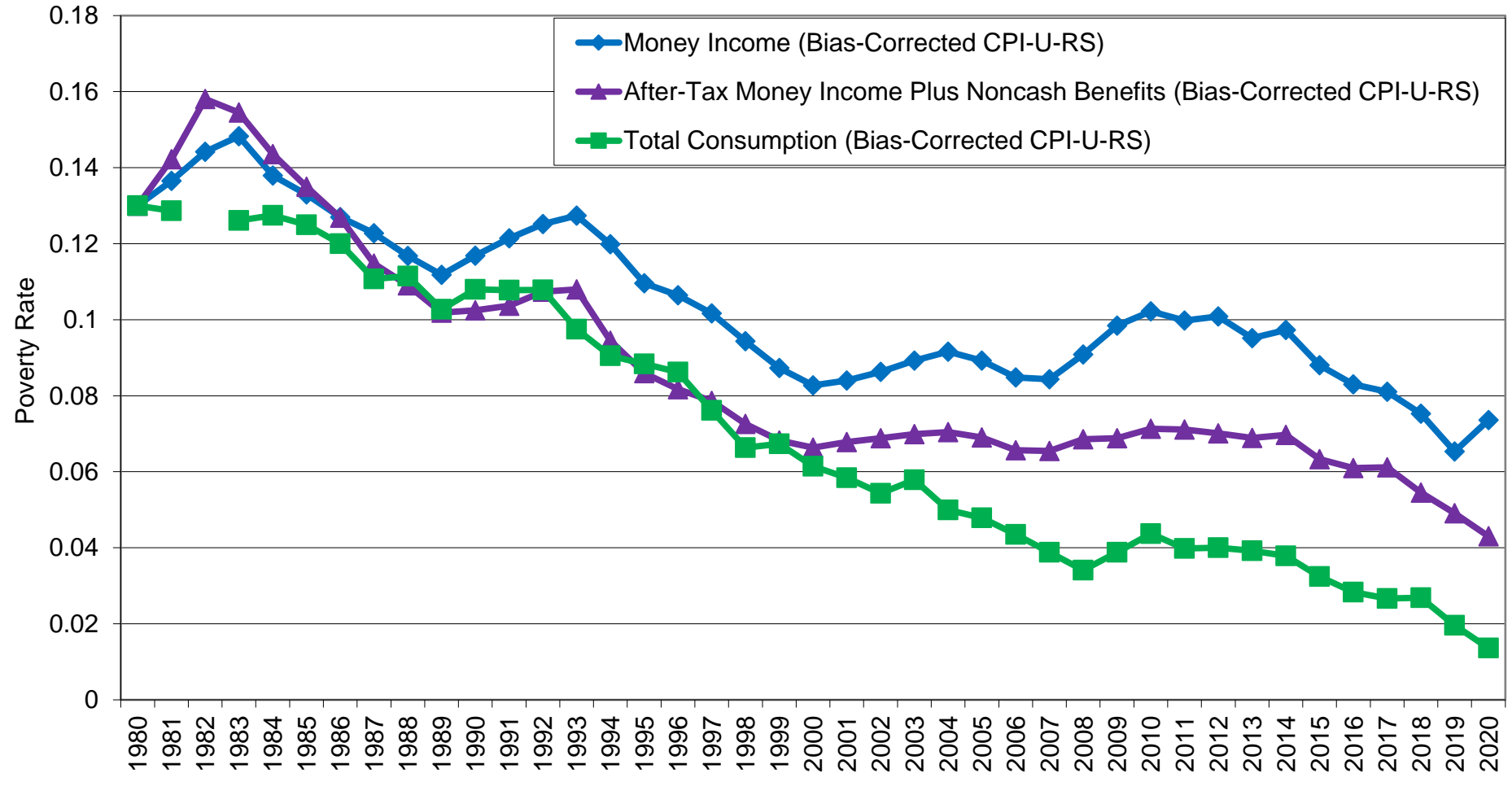


Figure 6: The Effect of OASDI on Changes in Poverty, Thresholds Anchored in 2000



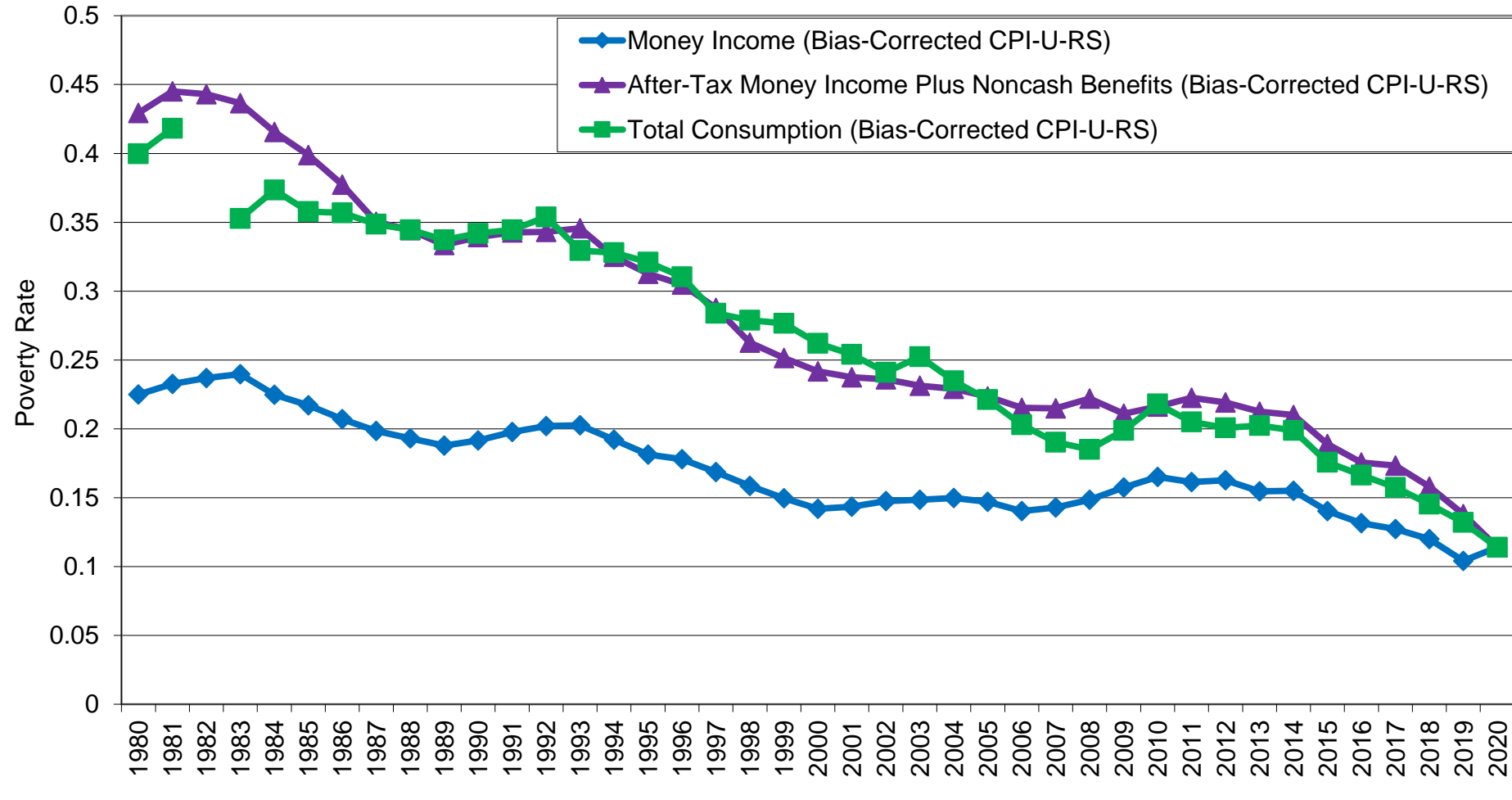
Notes: Social Security (OASDI) includes OASI, SSDI and railroad retirement. See notes to Figure 2 for more details.

Appendix Figure 1a: Consumption and Income Poverty Rates, 1980-2020, Thresholds Anchored in 1980



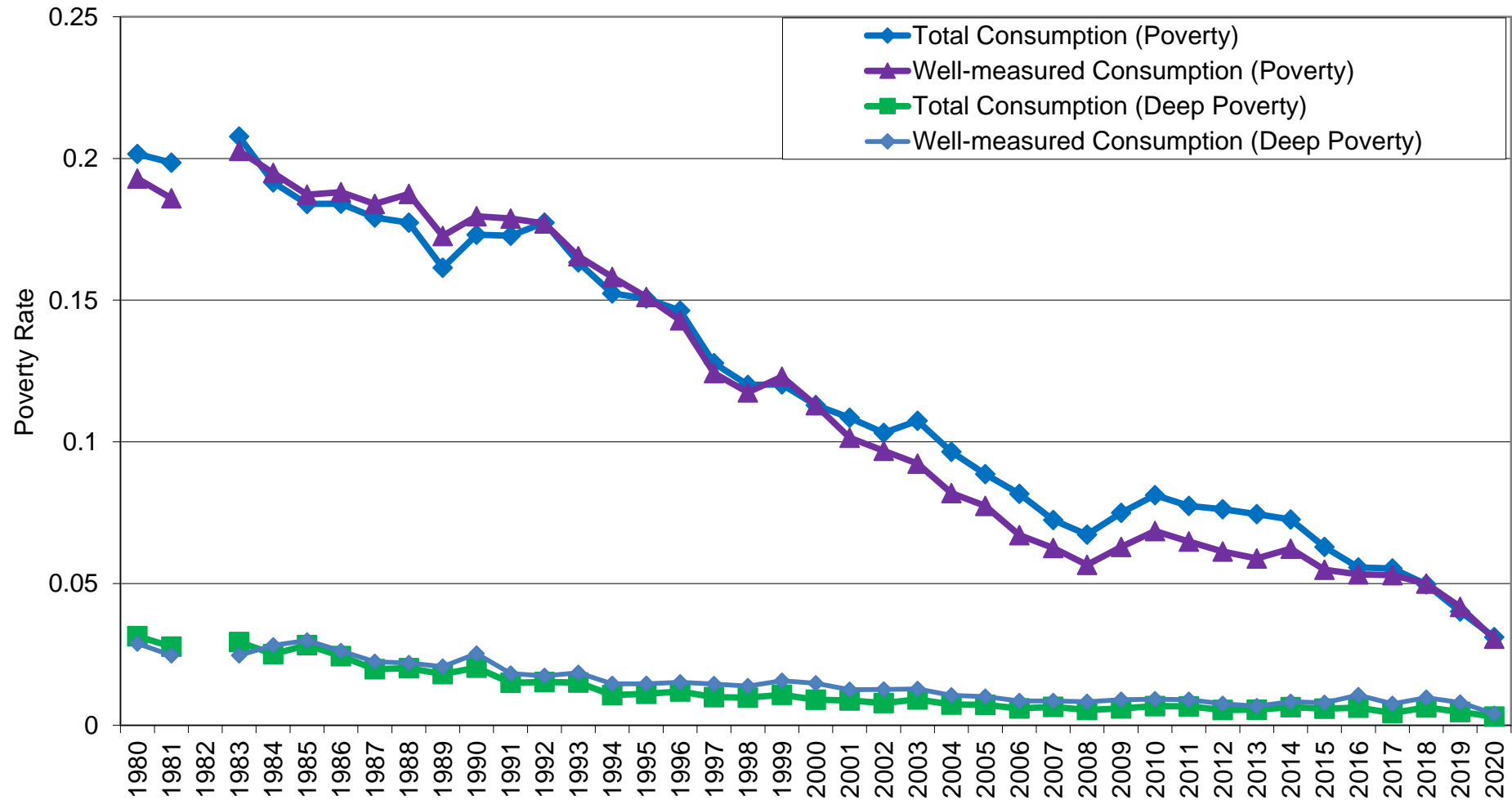
Notes: Income data are from the CPS-ASEC/ADF, Consumption data are from the CE Survey. After-Tax Money Income Plus Noncash Benefits includes taxes and credits, food stamps, and CPS-imputed measures of school lunch subsidies. For each measure the threshold in 1980 is equal to the value that yields a poverty rate equal to the official poverty rate in 1980 (13 percent). The thresholds in 1980 are then adjusted using the bias-corrected CPI-U-RS. See notes to Figure 2 for more details.

Appendix Figure 1b: Consumption and Income Poverty Rates, 1980-2020, Thresholds Anchored in 2020



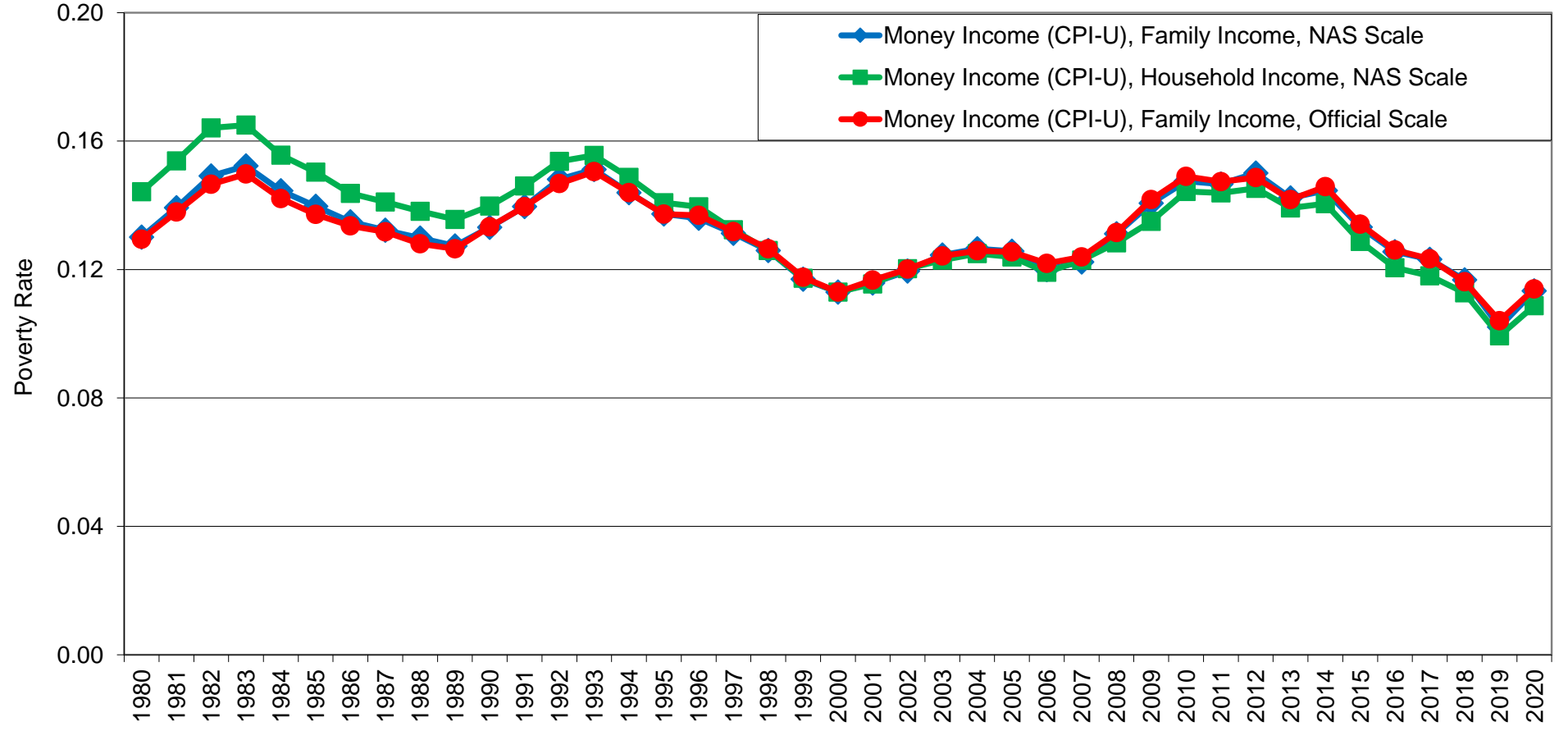
Notes: Income data are from the CPS-ASEC/ADF, Consumption data are from the CE Survey. After-Tax Money Income Plus Noncash Benefits includes taxes and credits, food stamps, and CPS-imputed measures of school lunch subsidies. For each measure the threshold in 2020 is equal to the value that yields a poverty rate equal to the official poverty rate in 2020 (11.4 percent). The thresholds in 2020 are then adjusted over time using the bias-corrected CPI-U-RS. See notes to Figure 2 for more details.

Appendix Figure 2: Poverty and Deep Poverty Rates for Total Consumption and Well-measured Consumption, 1980-2020



Note: Well-measured consumption includes only components that have been shown to measured well: food at home, housing (which includes rent for renters and a housing flow for owners) and utilities, vehicle service flows, gasoline and motor oil. For (deep) poverty measures the threshold in 2000 is equal to (50%) the value that yields a poverty rate equal to the official poverty rate in 2000 (11.3 percent). The thresholds in 2000 are then adjusted over time using the bias-

Appendix Figure 3: Money Income Poverty Rates Using Different Scales and Resource Units, 1980-2020 (Thresholds Anchored in 2000)



Notes: Data are from the CPS-ASEC/ADF. Money Income is the same resource measure used in the official poverty measure. For each measure the threshold in 2000 is equal to the value that yields a poverty rate equal to the official poverty rate in 2000 (11.3 percent). The thresholds in 2000 are then adjusted over time using the CPI-U. See notes to Figure 2 for more details.