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Evaluating the success of President Johnson's War on Poverty: Revisiting the historical record using a full-income poverty measure

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December 2019

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**Evaluating the Success of President Johnson's War on Poverty: Revisiting the Historical
Record Using a Full-Income Poverty Measure**

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Abstract

We evaluate progress in President's Johnson's War on Poverty. We do so relative to the scientifically arbitrary but policy relevant 20 percent baseline poverty rate he established for 1963. No existing poverty measure fully captures poverty reductions based on the standard that President Johnson set. To fill this gap, we develop a Full-income Poverty Measure with thresholds set to match the 1963 Official Poverty Rate. We include cash income, taxes, and major in-kind transfers and update poverty thresholds for inflation annually. While the Official Poverty Rate fell from 19.5 percent in 1963 to 12.3 percent in 2017, our Full-income Poverty Rate based on President Johnson's standards fell from 19.5 percent to 2.3 percent over that period. Today, almost all Americans have income above the inflation-adjusted thresholds established in the 1960s. Although expectations for minimum living standards evolve, this suggests substantial progress combatting absolute poverty since the War on Poverty began.

1. Introduction

In his State of the Union address on January 8, 1964, President Lyndon B. Johnson said: “This administration today, here and now, declares unconditional war on poverty in America” (Johnson 1965, p. 114). In a speech two months later, he outlined his terms of engagement:

“... I have called for a national war on poverty. Our objective: total victory. There are millions of Americans—one fifth of our people—who have not shared in the abundance which has been granted to most of us, and on whom the gates of opportunity have been closed” (Johnson 1965, p. 376).

Fifty-five years have passed since President Johnson declared the War on Poverty. Even so, policymakers and academics still debate its outcome. For example, President Reagan said in his 1988 State of the Union address that “the Federal Government declared war on poverty, and poverty won” (Reagan 1990, p. 87). Similarly, in 2014, Congressman Paul Ryan wrote that “the poverty rate is the highest in a generation” (Ryan 2014). Others have pointed to substantial progress, while making clear that President Johnson’s War on Poverty is not over. For example, the Council of Economic Advisers (2014) and Wimer et al. (2016) used an alternative poverty measure and found that poverty had declined by about 40 percent since 1967. The Council of Economic Advisers in 2018 suggest even greater progress and stated, “Based on historical standards of material wellbeing and the terms of engagement, our War on Poverty is largely over and a success” (CEA 2018, p. 29).

No existing poverty measure is capable of accurately evaluating the success of President Johnson’s War on Poverty as he defined it. Specifically, current measures either do not evaluate progress relative to President Johnson’s baseline poverty rate of about 20 percent in 1963 or ignore important anti-poverty programs. The U.S. Census Bureau’s Official Poverty Measure (OPM) shows a reduction in poverty from 19.5 percent in 1963 to 12.3 percent in 2017.

However, the entire decline occurred between 1963 and 1973. Over that period, the Official

Poverty Rate fell from 19.5 to 11.1 percent. Since then, it has never fallen below the 1973 rate. In 2017 it was 12.3 percent, indicating little progress since the early 1970s. This Official Poverty Rate was the evidence Reagan (1990) and Ryan (2014) cited for the lack of progress in the War on Poverty.

Academic researchers, however, view the Official Poverty Rate as flawed. They often cite its failure to capture the increase in in-kind benefits and tax-based transfers. A 1995 report from a National Academy of Sciences Panel outlined the limitations of the Official Poverty Measure (Citro and Michael 1995). Based on this report, the Census Bureau now publishes a Supplemental Poverty Measure (SPM) that addresses some of these failures. Academics have also developed alternative poverty measures, including an Absolute Supplemental Poverty Measure (Absolute-SPM) (Wimer et al. 2016) and a Consumption Poverty Measure (CPM) (Meyer and Sullivan 2003, 2012a, 2012b, 2018).¹

These alternate measures address some of the shortcomings of the Official Poverty Measure and show substantial reductions in poverty during the past 50 years. Nevertheless, we argue that these measures do not evaluate President Johnson’s War on Poverty as he defined it. In order to evaluate the War on Poverty, a poverty measure must meet three basic conditions. First, it must set its poverty thresholds so that its poverty rate in 1963 is equal to that set by President Johnson. This rate provides a uniform starting point for the share of people in poverty in 1963. Second, the 1963 poverty thresholds (also known as the “poverty line”) must remain

¹ Although Wimer et al. (2016) call their measure an “Anchored-SPM,” we refer to it in this paper as the Absolute-SPM since it is an absolute measure that holds constant the real value of its poverty thresholds over time. As we will discuss later, we use this terminology to avoid confusion in this paper and to distinguish it from poverty measures anchored to the Official Poverty Measure. Wimer et al. (2016) instead anchor to the Supplemental Poverty Rate in a given year.

constant in inflation-adjusted terms. Third, it must incorporate the full array of anti-poverty programs, including in-kind transfers and transfers administered through the tax code.

To fill this gap we create a poverty measure, which we refer to as the Full-income Poverty Measure (FPM). This measure maintains the same 1963 poverty rate as the Official Poverty Measure, matching Johnson's baseline poverty rate (Johnson 1965). We hold poverty thresholds constant in inflation-adjusted terms using the Personal Consumption Expenditure (PCE) price index. Additionally, unlike the Official Poverty Measure, we include all sources of income, including the market value of food stamps (now the Supplemental Nutrition Assistance Program, or SNAP), the school lunch program, housing assistance, and health insurance. Finally, we consider the household, rather than the family, as the unit within which individuals share resources.

Based on Johnson's standard, our Full-income Poverty Rate in 2017 is 2.3 percent, well below the Official Poverty Rate of 12.3 percent. Consequently, while recognizing that today's expectations for minimum living standards have evolved from those in the 1960s, a relatively small share of Americans now live in poverty based on President Johnson's initial standards. When conducting a crosswalk from the Official Poverty Measure to our Full-income Poverty Measure, we find that our wider income definition, the use of a more accurate inflation measure, and the use of a household rather than a family sharing unit are important drivers of this difference in trends.

The contribution of our paper is the first evaluation of President Johnson's War on Poverty that reflects his terms of engagement. In doing so, our measure is also the first to incorporate the array of anti-poverty programs introduced since the 1960s while maintaining Johnson's baseline poverty rate in 1963. Previous research improved upon the Official Poverty

Measure, such as work by Citro and Michael (1995), Fox et al. (2015), Wimer et al. (2016), and Meyer and Sullivan (2013a). Even so, none of these measures matches the official rate in 1963, and several incorporate additional changes such as switching away from an absolute poverty measure. These additional adjustments limit their ability to evaluate Johnson's War on Poverty. Consequently, no other poverty measure maintains President Johnson's baseline standard that 20 percent of people were in poverty in 1963, updates poverty thresholds based only on inflation, and includes a full measure of the resources to which Americans have access.

The remaining sections of the paper proceed as follows. Section 2 discusses our criteria for evaluating President Johnson's War on Poverty. Section 3 develops our Full-income Poverty Measure and shows how it improves on the Official Poverty Measure. Section 4 describes existing alternative poverty measures, and why they are unable to measure success in President Johnson's War on Poverty. Section 5 compares our Full-income Poverty Measure to these other existing measures. Section 6 offers a discussion of poverty trends, and implications for measuring poverty in the future. Section 7 concludes.

2. Criteria for evaluating the War on Poverty

When President Johnson declared his War on Poverty in 1964, much of the current social safety net did not exist. His declaration was followed by key legislation that expanded federal programs assisting low-income individuals including food stamps, Medicaid, and Medicare. None of these programs, which were created in response to President Johnson's call to fight poverty, are incorporated in the Official Poverty Measure.

In order to evaluate success in that war, a poverty measure must reflect the standards that President Johnson set. It also must reflect the array of anti-poverty programs implemented since

that time to fight the war. As discussed below, this requires satisfying three necessary conditions. First, the poverty threshold should maintain the initial 20 percent standard set by President Johnson. Second, the poverty thresholds should adjust with inflation to reflect an absolute standard. Finally, post-tax, post-transfer resources should be included in income given the government's use of in-kind transfers and tax policies to fight poverty.

The first condition, that the starting point maintains an initial 20 percent poverty rate in 1963, reflects President Johnson's initial declaration of the war based on his view of how many Americans lived in poverty.² This 20 percent baseline was developed by President Johnson's Council of Economic Advisers (CEA), which published its poverty measure in the 1964 Economic Report of the President.³ Subsequently, in response to President Johnson's War on Poverty, the Official Poverty Measure was implemented using a slightly different set of thresholds based on work by Orshansky (1965). Importantly, the Official Poverty Measure maintained a 1963 poverty rate of 19.5 percent (Census Bureau 1969b). Fisher (2008) argues that the Official Poverty Measure used Orshansky's thresholds based on an "economy" food plan instead of a "low-cost" food plan because these thresholds produced a poverty rate consistent with the CEA (1964) 20 percent baseline.

² Adjusting the threshold to maintain the 20 percent poverty rate is consistent with the Council of Economic Advisers (CEA)'s initial view of poverty. They stated that while they measured poverty using a cash money income concept out of necessity, had they been able to use a broader income concept "the total of money plus nonmoney income that would correspond to the limit used here would be somewhat higher" (CEA 1964, p. 59). Nevertheless, Lampman acknowledges that poverty "is to a certain extent subjective rather than objective" (Lampman 1971, p. 53) and the CEA states that "[a] case could be made ... for setting the over-all income limit either higher or lower than \$3,000, thereby changing the statistical measure of the size of the problem" (CEA 1964, p. 58).

³ After communications with President Kennedy in the spring of 1963, CEA (1964) set a \$3,000 threshold for families and a \$1,500 threshold for unrelated individuals to arrive at this approximately 20 percent poverty rate for 1962, its latest year of data. In a February 1, 1964 speech, President Johnson implied that his 20 percent poverty rate was based on the CEA thresholds. He said "Imagine what government would mean to you that attacked the poverty program if your income was among the 20 percent that earns less than \$3,000 per year" (Johnson 1965, p. 287).

Since poverty was defined using an absolute poverty standard, 1963 poverty thresholds should increase over time to reflect inflation. Using an absolute standard is consistent with the approach set in the Johnson Administration. In the 1964 Economic Report of the President, the Council of Economic Advisers used an absolute poverty line to calculate poverty rates back to 1947. Moreover, Robert Lampman, the senior CEA staff economist who authored the poverty chapter in the 1964 Economic Report of the President and was considered the “intellectual architect of the war on poverty” (Passell 1997), later argued that an absolute standard was appropriate for judging poverty efforts. He stated, “I do not think we should engage in frequent changes of the poverty line, other than to adjust for price changes” (Lampman 1971, p. 53).⁴

Finally, post-tax, post-transfer resources (including non-cash benefits) should be included in income so that poverty trends incorporate anti-poverty programs. The Canberra Group—in setting international standards for income measures—states that if there “is a change in the way in which some goods or services are funded—e.g. a change from government’s providing in-kind benefits to providing cash benefits—then a consistent cash income definition may give a misleading impression of how particular groups have fared over time” (Canberra Group 2001, p. 56).

The cash-income resource definition used for the Official Poverty Measure does not include in-kind benefits provided through anti-poverty programs. The exclusion of these in-kind benefits from the Official Poverty Measure is in large part because these programs were much less prevalent when the Official Poverty Measure was first developed in the 1960s. Including in-

⁴ Lampman recognizes, however, that holding poverty thresholds constant in real terms is also arbitrary. He states: “There are various ways to state such a goal. For example, one could say the goal is to bring families over a poverty line defined as that income equal to one-half the median income” (Lampman 1971, p. 48). This reflects the controversy over how to adjust thresholds that existed in the 1960s and continues today. In 1969 the Bureau of the Budget (now the Office of Management and Budget) directed that future thresholds adjustments would use the annual inflation rate, a decision still in effect today (Fisher 1992).

kind benefits in a poverty measure designed to evaluate the War on Poverty, however, is consistent with the CEA's view at the time that "[i]f it were possible to obtain estimates of total income—including non-money elements—for various types of families, those data would be preferable for the analysis" (CEA 1964, p. 58).

3. The Full-Income Poverty Measure relative to the Official Poverty Measure

The Official Poverty Measure cannot be used to measure success in President Johnson's War on Poverty based on the criteria above. It satisfies the condition that the starting poverty rate was approximately 20 percent in 1963. However, it excludes many anti-poverty programs introduced since the 1960s in response to the War on Poverty. It also uses an upwardly biased measure of inflation, meaning that while it attempts to keep poverty thresholds constant in real terms, it does not actually do so.

The Official Poverty Measure is based on pre-tax, post-cash transfer income, excluding all in-kind benefits as well as social assistance administered through the tax code. For example, this measure excludes food stamps, which were expanded and made permanent in the Food Stamp Act of 1964. It also excludes Medicaid and Medicare, which began after the 1965 Social Security Act, as well as other programs implemented since the 1960s through the tax code such as the Earned Income Tax Credit (EITC) and the Child Tax Credit (CTC).

Since the 1960s, however, these excluded sources of income have become increasingly important for low-income populations. The percent of the population receiving Medicaid increased from non-existent in 1963 (prior to the program's inception in 1965) to 22.2 percent in 2017. The percent receiving food stamps increased from 0.2 percent in 1964 when the program had not yet been implemented nationally, to 13.0 percent in 2017. Also, the percent of U.S. households receiving rental housing assistance increased from 0.9 percent in 1963 to 3.5 percent

in 2017, excluding those benefiting from the Low Income Housing Tax Credit (authors' calculations based on Truffer et al. 2012; CMS 2018; USDA 2018; Collinson et al. 2016; HUD 2018). In 2016, the U.S. spent \$673 billion on these three non-cash welfare programs alone (CEA 2018). By not including these benefits as resources, the Official Poverty Measure effectively puts a zero value on them and misses their importance in reducing material hardship.

In addition, the U.S. spent \$67 billion on the Earned Income Tax Credit and \$27 billion on the Additional Child Tax Credit in tax year 2016 (IRS 2016). These tax provisions that are predominately targeted to families with children who have low to moderate earnings did not exist in 1963 at the outset of the War on Poverty. The Official Poverty Measure, by looking at pre-tax income rather than post-tax income, will miss the value of these tax changes to the after-tax resources of families. The other major shortcoming of the Official Poverty Measure is that it adjusts the poverty line each year using the Bureau of Labor Statistics' (BLS) Consumer Price Index for all Urban Consumers (CPI-U). This prevents it from accurately tracking absolute rates of economic hardship. This is because the CPI-U has not used consistent methods to measure inflation over time and has historically overstated inflation (Boskin et al. 1996, Moulton 2018). As a result, using the CPI-U to adjust for inflation increases the poverty thresholds faster than is necessary to keep the threshold constant in real terms over time. The BLS, which produces the CPI-U, is aware of the limitations of the CPI-U. In fact, the BLS states that “[t]raditionally, the CPI was considered an upper bound on a cost-of-living index in that the CPI did not reflect changes in buying or consumption patterns that consumers would make to adjust to relative price changes” (BLS 2019, para. 4).

The BLS has improved the CPI-U over time by accounting for the ways in which consumers respond to increasing prices by substituting to different goods, but historical CPI-U

index values have not been updated to reflect these improvements. This means that the CPI-U overstates inflation in earlier years even relative to the inflation that would have been seen using the current methods for producing the series. The BLS makes these historical adjustments in another series, the CPI-U-RS, although the Census Bureau does not use the CPI-U-RS for poverty measurement.⁵ Additionally, as discussed further below, other price indices such as the PCE price index, produced by the Bureau of Economic Analysis, better account for the ability of consumers to substitute between broader categories of products when prices increase. As a result, both the CPI-U and CPI-U-RS generally overstate inflation.⁶

Our Full-income Poverty Measure addresses these limitations of the Official Poverty Measure and, as a result, can evaluate the progress in President Johnson’s War on Poverty based on the criteria above. This measure uses the same Current Population Survey–Annual Social and Economic Supplement (CPS-ASEC) data as the Official Poverty Measure. In creating the Full-income Poverty Measure, we anchor it to the Official Measure by choosing thresholds that result in a poverty rate of 19.5 percent in 1963—an approximation of the 20 percent of the population President Johnson declared to be poor. We also incorporate anti-poverty programs left out of the Official Measure by using a post-tax, post-transfer income definition. Since we are broadening the income definition beyond that of the Official Poverty Measure, we adjust the thresholds upwards to reflect the additional income sources we include, and adjust the thresholds downwards to reflect income sources we exclude (i.e., taxes paid).⁷ Finally, we adopt an absolute

⁵ Because the CPI-U-RS is not available for the period from 1963-1978, we use the CPI-U inflation growth over this period in our analysis that follows whenever using the CPI-U-RS. This matches the Census Bureau’s approach to using CPI-U-RS for their annual income report (Fontenot, Semega, and Kollar 2018). However, this will likely increase observed inflation relative to the case where the adjustments were available for the entire period.

⁶ Another BLS measure, the Chained CPI-U (C-CPI-U), accounts for this form of substitution across broader product categories, but is only available since 2000 and the Census Bureau does not use it for poverty measurement.

⁷ This means that when adding programs to the income definition that existed in 1963 but are excluded from the Official Poverty Measure, our threshold shifts to maintain the nearly 20 percent poverty rate in 1963. However,

poverty standard to adjust thresholds each year using the PCE, our preferred measure of inflation.

More specifically, the Full-income Poverty Measure estimates the share of people in poverty using a post-tax, (comprehensive or full) post-transfer definition of income. Similar to the Official Poverty Measure, it includes market income (wages and salaries, self-employment and business income, farm income, retirement income from pensions, dividends, interest, rent and alimony) and cash transfers (Aid to Families with Dependent Children/Temporary Assistance for Needy Families, Social Security and workers' compensation). It then adds the market value of health and non-health in-kind transfers (food stamps/SNAP, subsidized school lunches, rental housing assistance, and Medicare and Medicaid) as well as the market value of employer-provided health insurance. It subtracts Federal income and payroll taxes but adds tax credits including the Earned Income Tax Credit, Child Tax Credit, and Additional Child Tax Credit (the refundable portion of the CTC) based on estimated tax liabilities using NBER Taxsim 9.3 (Feenberg and Coutts 1993). We impute several of these income sources in the early years of our analysis because they were not collected in the CPS-ASEC. See Appendix A for details on these imputations.

The inclusion of the market value of health insurance in the resource measure of our Full-income Poverty Measure follows a growing body of research showing its importance for income distribution trends (Burkhauser, Larrimore, and Simon 2012; Armour, Burkhauser, and Larrimore 2013; Kaestner and Lubotsky 2016). Beginning in 2013, the Congressional Budget Office (CBO 2013) adopted the same valuation for health insurance in its reports on income

adding programs that did not exist in 1963 does not change the initial threshold since no individuals were yet receiving resources from these programs. This results in a consistent treatment of programs that existed in 1963 and programs that did not.

distribution trends. Some poverty measures have included a non-zero value of health insurance as well (e.g., Smeeding 1977; Meyer and Sullivan 2012b; Korenman and Remler 2016; National Academies of Sciences 2019). Poverty measures that entirely exclude the value of health insurance as a source of income effectively place a zero value on such insurance and hence do not capture all of the resources people receive that can help lift them above poverty thresholds.⁸

The market value of public health insurance (Medicare and Medicaid) is calculated based on the cost of its provision to different risk classes of individuals based on their age, disability status and state of residence.⁹ Thus, every individual who is in the same one of these risk classes and lives in the same state is assigned the same market value of health insurance. This value is the average cost of providing the health insurance to this group of individuals.

The market value of employer provided health insurance is calculated based on the cost paid by employers on behalf of their employees, excluding any premiums paid by employees or their families. This value is determined based on average employer payments for health care (see Elwell, Corinth and Burkhauser 2019 and Appendix A for further details).

While the Full-income Poverty Measure includes a comprehensive set of income sources, it will nonetheless understate income due to underreporting of transfers in the CPS-ASEC.

⁸ Finkelstein, Hendren, and Luttmer (2015) suggest only 20 to 40 percent of welfare benefits of Medicaid accrue to beneficiaries, largely due to it offsetting the value of uncompensated care for the uninsured. If uncompensated care were available to the uninsured at the same rates in 1963 as it is today, including the value of this care would increase the poverty thresholds (in order to maintain the anchored 20 percent poverty rate in 1963) and partially offset the reductions in poverty observed in this paper from increases in health insurance coverage. However, the 1986 Emergency Medical Treatment and Labor Act required treatment in emergency rooms irrespective of ability to pay. This likely increased the availability of uncompensated care, which would suggest additional poverty reductions after the passage of the Act. Recognizing the uncertainty of trends in the value of uncompensated care, we do not attempt to estimate the value of this care and instead show Full-income Poverty Rates both with and without including the market value of health insurance.

⁹ As discussed in Appendix A, the Census Bureau provided these values from 1979 and 2014. We follow Elwell, Corinth and Burkhauser (2019) to estimate these values in years prior to 1979 and we follow procedures from the Census Bureau (2015) to estimate these values for years since 2015. Consistent with the Census Bureau's approach and the tendency for "dual-eligible" individuals to have higher medical costs, individuals who are eligible for both Medicare and Medicaid are assigned the sum of the market value of Medicare and Medicaid.

Recent research suggests that respondents in the CPS-ASEC and other major surveys underreport transfers (Meyer, Mok and Sullivan 2015) and money income (Burtless and Pulliam 2018), and that underreporting has increased over time. For example, in the average year between 2000 and 2012, CPS-ASEC respondents reported 42 percent fewer dollars in SNAP benefits than they actually received according to administrative data. This underreporting has tended to increase by about 0.6 percentage points each year. Meyer, Mittag and Goerge (2018) link individual survey data to individual-level administrative data in Illinois and Maryland, and find that half of true SNAP recipients in these two states do not report SNAP receipt in the CPS-ASEC.¹⁰

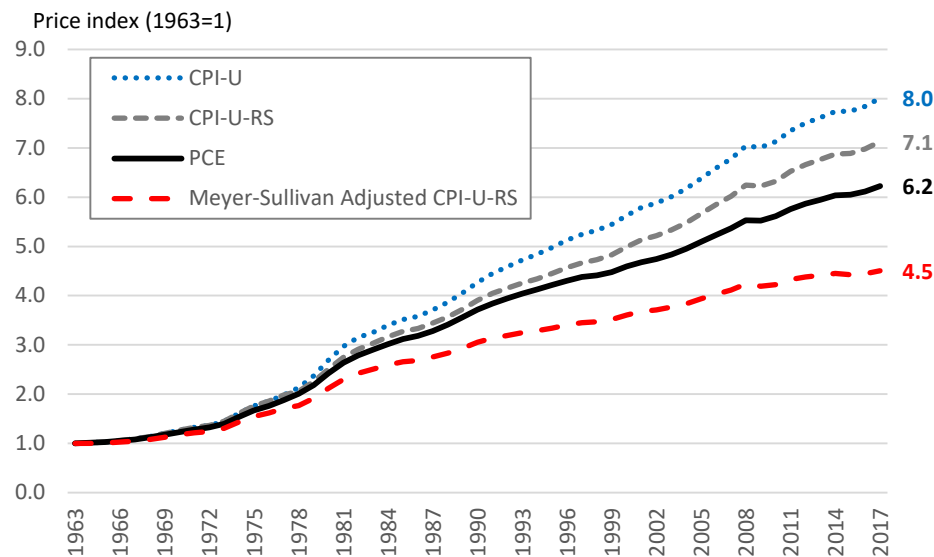
We adjust the poverty thresholds for inflation each year using the Personal Consumption Expenditure (PCE) price index. Since 2000, this has been the inflation measure reported by the Federal Reserve Board for their Monetary Policy Report (Federal Reserve 2000), and since 2012 has been the inflation measure used by the CBO in its reports on the distribution of household income over time (CBO 2013). Unlike the CPI-U, which is used for the Official Poverty Measure, the PCE price index accounts for consumer substitution and is consistent over time. This results in a less biased assessment of inflation than that produced by the CPI-U. (See Bullard 2013 and Winship 2016 for discussions of why the PCE is a preferred inflation index).

Although we opt to use the PCE price index to adjust for inflation, Meyer and Sullivan (2012b) have created alternative inflation measures to correct for substitution bias as well as bias from the failure to account for new or higher quality goods. We refer to this series as the Meyer-Sullivan adjusted CPI-U-RS. This series, which shows slower inflation than the PCE, adjusts for biases in the CPI-U-RS based on estimates from the Boskin Commission (Boskin et al. 1996) and follow-up work by Hausman (2003), Berndt (2006) and Gordon (2006).

¹⁰ Larrimore and Splinter (2019) also find an undervaluation of employer provided health insurance in the CPS-ASEC, although this concern is less important for poverty measurement.

Figure 1 shows the importance of the choice of inflation measure for determining how much the nominal dollar value of poverty thresholds must increase each year to hold their real dollar values at 1963 levels. Compared to 1963 thresholds, in 2017 the CPI-U used by the Official Poverty Measure generates a threshold that is 8.0 times as high in nominal dollars to hold the real value of the thresholds constant. To the degree that this is an overstatement of inflation, it will effectively raise the real level of these poverty thresholds and exaggerate the share of people in poverty in 2017 relative to 1963. In contrast, all of the other measures of inflation shown result in smaller changes in nominal thresholds. In particular, the PCE—which we use for the Full-income Poverty Measure—generates nominal thresholds in 2017 that are 22 percent below the thresholds using the Official Poverty Measure’s CPI-U, whereas using the Meyer-Sullivan adjusted CPI-U-RS would generate thresholds that are 46 percent below that using the CPI-U.

Figure 1. Price index based on various inflation measures, 1963 to 2017



Sources: Bureau of Labor Statistics, Bureau of Economic Analysis; Authors’ calculations.

Note: CPI denotes Consumer Price Index. CPI-U-RS denotes CPI Research Series. PCE denotes Personal Consumption Expenditure price index. As described in Meyer and Sullivan (2012b, 2018), the Meyer-Sullivan adjusted CPI-U-RS is calculated by subtracting 0.8 percentage points from the growth rate in the CPI-U-RS for each year from 1978 through 2017, and subtracting 1.1 percentage points from the growth rate in the CPI-U-RS for each year from 1963 through 1977.

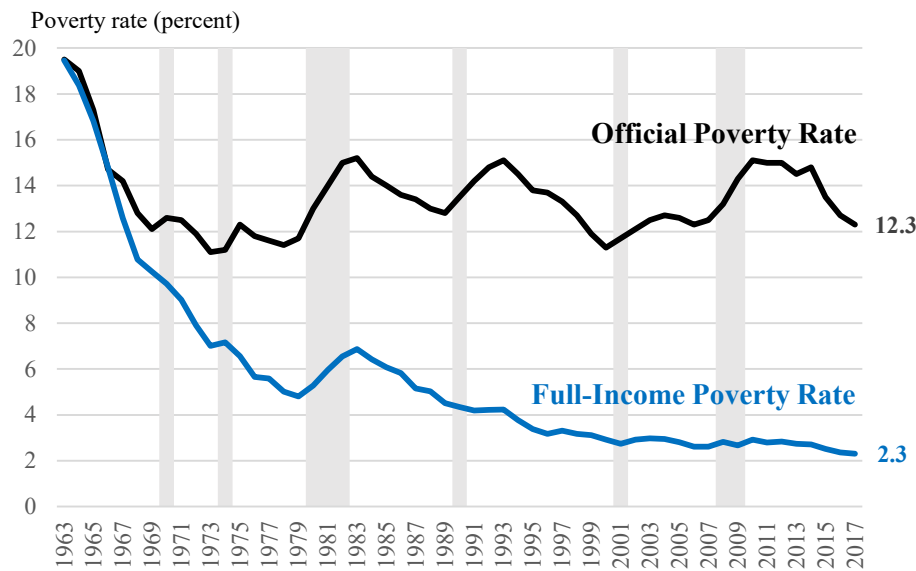
The final differences between the Full-income Poverty Measure and the Official Measure are the specification of the sharing unit and equivalence scale. We assume that income is shared among all people in the household. This is broader than the family sharing unit used by the Official Poverty Measure, but is close to the sharing unit used for the Supplemental Poverty Measure and the Consumption Poverty Measure. However, the Supplemental and Consumption Poverty Measures do not necessarily group all household members together. Our focus on the household reflects the increasing prevalence of cohabitation in the U.S. and thus the sharing of resources across families within the same household (Canberra Group 2011; Fry and Cohn 2011). For our equivalence scale, we adjust poverty thresholds based on the square root of the number of people in the household. For example, the poverty threshold for a 4-person household is twice that for a 1-person household. This approach matches the common equivalence scale used by Gottschalk and Smeeding (1997), Canberra Group (2011), and Forster and d’Ercole (2012) in the broader income distribution literature.

Trends in the Full-Income Poverty Rate. Figure 2 details the trend in the Full-income Poverty Rate relative to the Official Poverty Rate. By construction, the 1963 Full-income Poverty Rate and Official Poverty Rate are identical.¹¹ The Full-income Poverty Rate subsequently falls most dramatically between 1963 and 1973 (from 19.5 percent in 1963 to 7.0 percent in 1973) and, with the exception of one year, continues to fall, reaching 4.8 percent in 1979. This suggests that there was dramatic progress in the War on Poverty in its first 16 years that is obscured and understated in magnitude by the failure of the Official Poverty Measure to capture important poverty alleviation programs. While the Official Poverty Rate has never been below its 1973

¹¹ While these measures capture the same percentage of the population in 1963, as any anchored poverty measures do, the population below the poverty thresholds under each measure are not the same people. Thus, our implicit assumption is that President Johnson was concerned about the bottom fifth of Americans (properly measured) in the resource distribution, not necessarily the bottom fifth identified as poor by the Official Poverty Measure in 1963.

level, this is not the case for the Full-income Poverty Rate. Full-income poverty increases in conjunction with the double-dip recession between 1980 and 1982 and the failure of transfer program benefits to keep up with the double-digit inflation of this period, rising to 6.9 percent by 1983. However, it then falls almost continuously until 2001 when it reaches 2.7 percent. The Full-income Poverty Rate never again exceeds 3.0 percent, and falls to 2.3 percent in 2017.

Figure 2. Official Poverty Rate and Full-Income Poverty Rate, 1963 to 2017



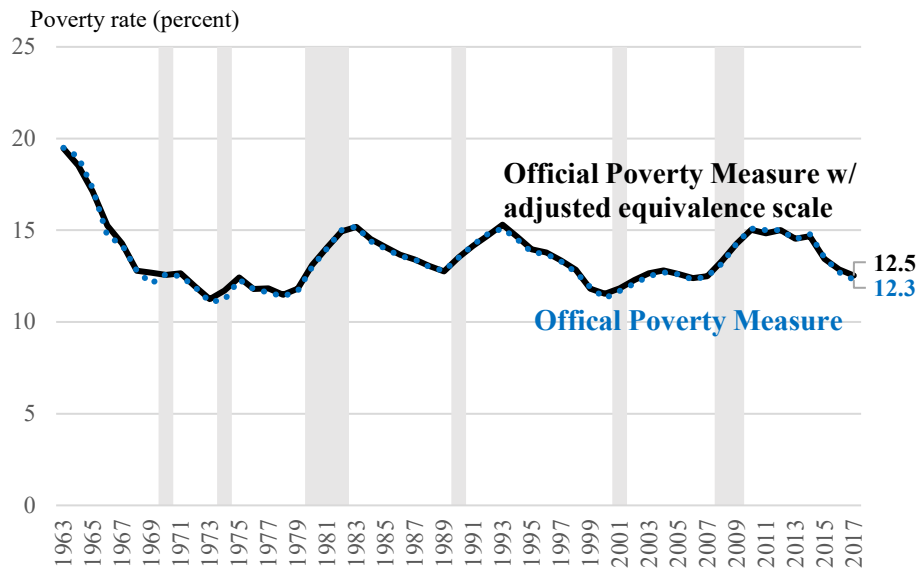
Source: IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors' calculations.

Note: Shading denotes NBER-based recession periods.

By adjusting elements of the poverty measure in single steps, we can observe the source of these poverty reductions that are missed in the Official Measure. Figure 3 shows the original Official Poverty Rates along with a poverty measure using the equivalence scale from our Full-income Measure but leaving all other characteristics of the Official Poverty Measure unchanged. The poverty trends are nearly identical, implying that the equivalence scale plays no role in the decline in poverty under our Full-income Measure. In fact, the poverty threshold for a one-person family using the square root of the number of persons in a sharing unit equivalence scale (the method used in the Full-income Poverty Measure) in 1963 is \$1,531, exactly equal to the

weighted average poverty threshold for the Official Measure across farm and non-farm families in 1963 (Census Bureau 1969a). That these poverty trends and thresholds are nearly identical is unsurprising in light of previous research finding that an equivalence scale based on the square root of the number of members in the sharing unit does not materially affect overall poverty rates (see, for example, Burkhauser, Smeeding, and Merz 1996).¹²

Figure 3. Poverty rate based on Official Poverty Measure, with and without adjusted equivalence scale, 1963 to 2017



Sources: Census Bureau; Current Population Survey; Authors' calculations.

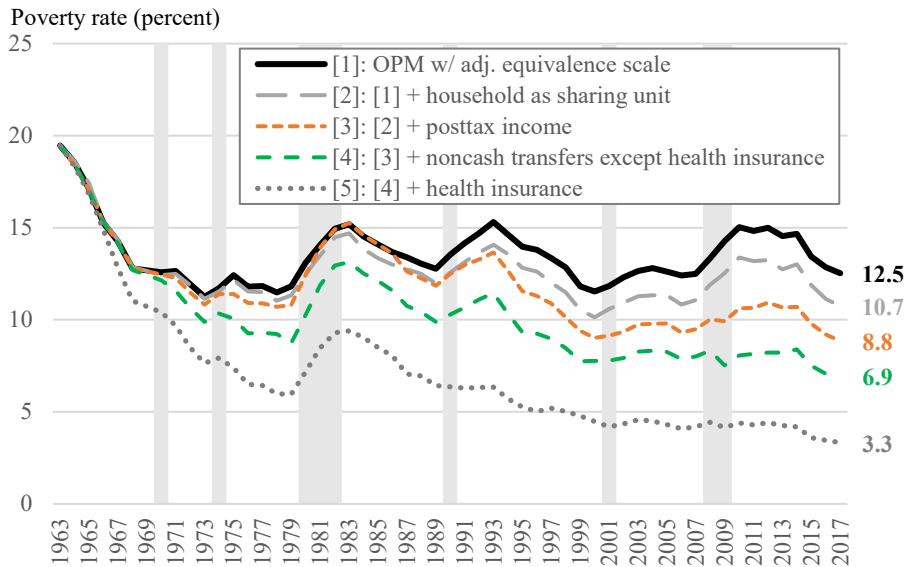
Note: Shading denotes NBER-based recession periods. The Official Poverty Measure under the adjusted equivalence scale recreates poverty thresholds based on the square root of the number of family members, instead of the more complex formula used by the Official Poverty Measure.

Figure 4 shows the Official Poverty Measure modified only based on the equivalence scale change in Figure 3 as a baseline, and then shows how other iterative changes to the income-definition made under the Full-income Poverty Measure affect the poverty rate trend. Note that all iterations of our crosswalk to our preferred Full-income Poverty Measure are anchored to

¹² Although this choice has little effect on the trends in overall poverty rates in a country, Burkhauser, Smeeding, and Merz (1996) show that the choice of equivalence scale affect the characteristics of sharing units considered poor (e.g., larger sharing units headed by a working-age person with children vs. older persons without children).

preserve the 19.5 percent share of the population that President Johnson’s War on Poverty determined were poor in 1963 as implemented in the Official Poverty Measure.¹³ Using the household instead of the family as the sharing unit reduces the poverty rate 54 years later in 2017 to 10.7 percent—lower than the 12.5 percent using the Official Poverty Measure with the adjusted equivalence scale from Figure 3.

Figure 4. Crosswalk of income components from the Official Poverty Rate with adjusted equivalence scale to the Full-Income Poverty Rate, 1963 to 2017



Source: IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors’ calculations.

Note: Shading denotes NBER-based recession periods.

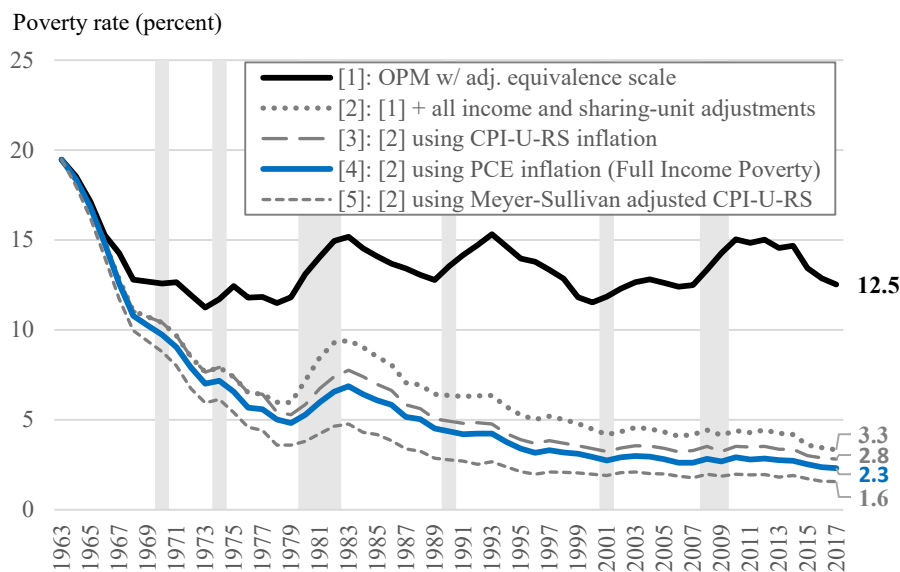
Using a post-tax measure of income reduces the 2017 poverty rate further to 8.8 percent. Incorporating the market value of non-cash transfers except for health insurance reduces it to 6.9 percent, which offers an upper bound assessment of the Full-income Poverty Rate by assigning a zero value to health insurance (and using the CPI-U) while still capturing the poverty reduction

¹³ While we consider this an important adjustment to avoid mechanically suggesting that broader income definitions must reduce poverty, this approach differs from the approach in the Census Bureau’s Supplemental Poverty Report, which does not adjust thresholds when adding or removing income sources (Fox 2018).

from other in-kind transfers excluded from the Official Poverty Measure. Incorporating the market value of health insurance reduces it further to 3.3 percent.

As discussed above, the CPI-U is known to upwardly bias inflation and diminish the extent of poverty reduction over time. Figure 5 illustrates the effect of using alternate measures of inflation. Moving from the CPI-U to the CPI-U-RS reduces the rate further to 2.8 percent. Using the PCE reduces it even further to 2.3 percent, which is the estimate under our preferred Full-income Poverty Measure specification. If we instead use the lower Meyer-Sullivan adjusted CPI-U-RS inflation measure, the Full-income Poverty Rate falls to 1.6 percent in 2017.

Figure 5. Crosswalk of inflation measures from the Official Poverty Rate with adjusted equivalence scale to the Full-Income Poverty Rate, 1963 to 2017



Source: IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors' calculations.
 Note: Shading denotes NBER-based recession periods.

The order in which we add these elements of the Full-income Poverty Measure affects their relative contribution to reducing the poverty rate. Nevertheless, it is clear that the sharing unit used, the use of a post-tax measure of income, the inclusion of in-kind transfers (except

health insurance), the inclusion of the market value of health insurance, and the measure of inflation used are all important drivers of the poverty trend under our Full-income Measure.

In Table 1, we show the sensitivity of our preferred specification of the Full-income Poverty Measure to individual changes in one of three characteristics—the inflation measure used, the resources included and the sharing unit used. All of the various measures considered in Table 1 are anchored such that their poverty rates in 1963 are 19.5 percent.

Table 1. Sensitivity of poverty rate under Full-income Poverty Measure to various characteristics

	Inflation measure	Resources	Sharing unit	Poverty rate in 2017
[0]	PCE	Full-income	Household	2.3
[1]	CPI-U	Full-income	Household	3.3
[2]	CPI-U-RS	Full-income	Household	2.8
[3]	Meyer-Sullivan Adjusted CPI-U-RS	Full-income	Household	1.6
[4]	PCE	Excluding health insurance	Household	4.6
[5]	PCE	Excluding non-health in-kind transfers	Household	2.9
[6]	PCE	Before-tax, otherwise full-income	Household	2.7
[7]	PCE	Full-income	Family	3.9

Note: All alternative poverty measures are anchored such that the poverty rate is 19.5 percent in 1963. Each poverty measure is based on the Full-income Poverty Measure described above—in addition to the elements listed in the columns of the table, we use an equivalence scale based on the square root of the number of members in the sharing unit, and use a post-tax measure of income for all poverty measures, except where noted.

The first row of Table 1 is our base case, which uses a PCE inflation rate, a full-income measure of resources, and the household as the sharing unit. As discussed above this base case of the Full-income Poverty Measure results in a poverty rate of 2.3 percent in 2017. Holding the last two characteristics constant and varying the inflation rate results in a poverty rate of between 3.3 percent using the CPI-U and 1.6 percent using the Meyer-Sullivan adjusted CPI-U-RS. Holding

constant PCE as the inflation rate and household as the sharing unit we see that excluding health insurance results in the largest single divergence from our base case of 2.3 percent, and increases the poverty rate to 4.6 percent. Excluding non-health in-kind transfers only increases the poverty rate to 2.9 percent. When we ignore the importance of taxes but continue to include all in-kind transfers the poverty rate increases to 2.7 percent. When we keep PCE as our inflation rate and full-income as our resource measure but shift from a household to a family sharing unit, the poverty rate increases to 3.9 percent.

4. Limitations of Existing Alternative Poverty Measures

Although other alternatives to the Official Poverty Measure exist, none of these existing alternative poverty measures satisfy all three conditions for fully evaluating success in President Johnson's War on Poverty. The Census Bureau's Supplemental Poverty Measure, which is the most prominent alternative poverty measure, partially incorporates anti-poverty programs. However, it also dramatically redefines poverty by changing the baseline poverty rate and by increasing the real poverty thresholds over time. An academic research measure, the Absolute Supplemental Poverty Measure (Wimer et al. 2016), also partially incorporates anti-poverty programs, but changes the baseline 1963 poverty rate. Finally, a Consumption Poverty Measure (CPM) developed by Meyer and Sullivan (2003; 2012a, 2012b, 2018) uses consumption rather than income as its resource measure. It is also anchored to the 1980 Official Poverty Rate, rather than 1963, and does not include the value of health insurance. We next summarize each of these existing poverty measures with an emphasis on how they do or do not satisfy these conditions. Table 2 compares their basic characteristics alongside the characteristics of the Official Poverty Measure and Full-income Poverty Measure discussed above.

Table 2. Characteristics of alternative poverty measures

	Official Poverty Measure	Supplemental Poverty Measure	Absolute-Supplemental Poverty Measure (Wimer et al. 2016)	Consumption Poverty Measure (Meyer and Sullivan 2012b)	Full-income Poverty Measure
Income included:					
Cash income (market income and cash transfers)	Yes	Yes	Yes	N/A*	Yes
In-kind transfers except healthcare	No	Yes	Yes	N/A*	Yes
Market value of health insurance	No	No	No	N/A*	Yes
Deduct income and payroll taxes; add tax credits	No	Yes	Yes	N/A*	Yes
Expenses deducted	No	Health, child care, work expenses	Health, child care, work expenses	N/A*	No
Regional cost of living adjustment	No	Yes	No	No	No
How thresholds are updated	CPI-U	Quasi-relative**	CPI-U-RS	Meyer-Sullivan Adjusted-CPI-U-RS	PCE
Sharing unit***	Family	Family, unmarried partners and their children, unrelated children under 15	Family, unmarried partners and their children, unrelated children under 15	Household members sharing resources and expenses	Household

Sources: Census Bureau; Fontenot et al. (2018); Fox et al. (2015); Wimer et al. (2016); Meyer and Sullivan (2012b, 2018).

Note: Private market income includes wages, salary, self-employment and property income.

*The Consumption Poverty Measure includes consumption rather than income. It includes almost all spending to measure consumption, but excludes spending on home and vehicle purchases (replaced by flow value of ownership), health, and education

**Equal to 5-year average of spending on necessities by moderate expenditure households multiplied by 1.2

*** The size-adjustments for each sharing unit also differ. The Official Poverty Measure uses the cost of a food plan for a family of a given size; the two Supplemental Poverty Measures and the Consumption Poverty Measure use a formula based on the number of adults and children in the household; and the Full-income Poverty Measure uses the square root of household size.

Supplemental Poverty Measure (SPM). The Supplemental Poverty Measure has been published by the Census Bureau since 2009 (Fox 2018) and was extended back to 1967 by Fox et al. (2015). This alternate measure cannot evaluate the success in President Johnson’s War on Poverty. Building off concepts outlined in Citro and Michael (1995), the Supplemental Poverty Measure represents a fundamental shift away from an absolute poverty standard and toward a relative one for purposes of changing the thresholds over time. A key feature of this measure is the adoption of “quasi-relative” thresholds that are based on expenditures on basic necessities including housing, food, clothing and utilities, by households at the 30th to 36th percentile of the

distribution of spending in these categories. This spending is then multiplied by 1.2 to generate poverty thresholds that reflect expenditures on other necessities.

Like the Official Poverty Thresholds, the initial Supplemental Poverty Thresholds are arbitrary. However, while the Official Poverty Thresholds are consistent with President Johnson's baseline standard, this is not the case with the Supplemental Poverty Measure. Instead, the Supplemental Poverty Thresholds suggest that poverty rates in 1963 were substantially higher.¹⁴ In addition, President Johnson structured the War on Poverty as a fight against absolute impoverishment, not inequality. Since real spending by moderate expenditure households has increased since 1963, the Supplemental Poverty Thresholds have increased in real terms. This implicitly redefines poverty measurement away from absolute poverty and towards inequality, hence making the Supplemental Poverty Measure unsuitable for evaluating President Johnson's War on Poverty.

Nonetheless, the Supplemental Poverty Measure improves on the Official Measure by including more sources of income in its resource measure. The supplemental measure includes non-cash transfers such as SNAP and housing benefits, although it excludes the market value of health insurance. It is also a post-tax measure of income, as it includes tax credits such as the Earned Income Tax Credit and the Child Tax Credit, while subtracting taxes paid. The Supplemental Poverty Measure makes several other adjustments to income as well. These include deducting child care and medical out-of-pocket expenses, as well as varying thresholds across geographical areas based on housing costs and differences in expenses.

¹⁴ The historical Supplemental Poverty Rate produced by Fox et al. (2015) is only available back to 1967. In that year, the Supplemental Poverty Rate was approximately 4.4 percentage points above the Official Poverty Rate. Consequently, the higher Supplemental Poverty Rate in this series results in part from the higher starting value, even though poverty based on this Supplemental Measure has declined by more than the Official Rate since 1967.

This deduction of out-of-pocket expenses, unfortunately, can lead to perverse results. Meyer and Sullivan (2012a) find that the Supplemental Poverty Measure's deduction of medical out-of-pocket expenses causes apparently less deprived individuals to appear poor relative to the Official Poverty Measure. Specifically, it leads to more people with higher levels of consumption, higher levels of educational attainment, larger homes, and higher likelihoods of health insurance coverage as appearing poor. Furthermore, this deduction skews the perceived effect of public policies. For example, the Affordable Care Act increased the number of people covered by health insurance and heavily subsidized coverage for lower income families. However, in many cases insured patients must still pay some out-of-pocket expenses. The Supplemental Poverty Measure would subtract these out-of-pocket expenses from income (which they may not have incurred without insurance) but not count the value of the subsidized insurance in its measure of poverty.

Absolute Supplemental Poverty Measure (Absolute-SPM). Wimer et al. (2016) created a variation of the Supplemental Poverty Measure, which they call an "anchored-SPM." Currently, this series cannot be directly compared to the Official Poverty Measure because it does not attempt to match the Official Poverty Rate in 1963 or any other year (although conceptually such a comparison is feasible as discussed below).¹⁵ Instead, this measure is anchored to the Supplemental Poverty Rate in a given year. That is, the initial thresholds are arbitrarily defined in a given year based on expenditures by moderate expenditure households in that period, and then thresholds are updated in all other years based on inflation. While poverty rates from Wimer et al. (2016) cannot be directly compared to the Official Poverty Measure, their measure is, at

¹⁵ Similar to the Supplemental Poverty Measure, the Absolute-SPM is unavailable prior to 1967 but was 4.4 percentage points higher than the Official Poverty Rate in that year, suggesting a 1963 Absolute-SPM poverty rate that also exceeds the initial 1963 Official Poverty Rate.

least conceptually, an absolute poverty measure since its thresholds are updated each year based on inflation. Thus, we refer to it as the “Absolute Supplemental Poverty Measure” (Absolute-SPM) in order to distinguish it from poverty measures anchored to the Official Poverty Measure.

The Absolute-SPM uses the CPI-U-RS to adjust thresholds each year. This is preferable to using the CPI-U, but to the extent that the CPI-U-RS also overstates inflation, long-run declines in poverty under this measure will be shallower than trends would be if it used the PCE. In addition, similar to the traditional Supplemental Poverty Measure, the Absolute-SPM omits the market value of health insurance as a source of income—the largest current in-kind transfer.

Consumption Poverty Measure (CPM). The final poverty measure we consider is the Consumption Poverty Measure developed by Meyer and Sullivan (2003; 2012a, 2012b, 2017, 2018). It is based on how much households spend rather than their income. Consumption-based measures differ conceptually from income-based measures in that households with low incomes but high capacities to consume in that year (for instance because they have higher levels of wealth or higher capacities to borrow) are not counted as poor. One practical advantage of consumption-based measures is that they are not affected by the increasing underreporting of income and especially welfare benefits in the CPS-ASEC (Meyer, Mok, and Sullivan 2015), although they are still subject to biases in reporting of spending patterns. While consumption underreporting has also increased over time, Meyer and Sullivan (2013b, 2018) suggest that the problem may be overstated and likely has only a limited effect on consumption poverty trends.

While the Consumption Poverty Measure deviates from the Official Poverty Measure by focusing on consumption, like the Official Measure it is capturing absolute poverty. It attempts to hold the real dollar value of its thresholds constant over time using the Meyer-Sullivan adjusted CPI-U-RS as its measure of inflation. Although Meyer and Sullivan explain that their

adjusted inflation measure reflects technological improvements, their adjusted inflation measure has increased substantially slower than other indices, as seen previously in Figure 1.

In addition, unlike the Supplemental Poverty Measure and Absolute-SPM, the Consumption Poverty Measure is anchored to the Official Poverty Rate. However, the underlying consumption data from the Consumer Expenditure Survey are unavailable in 1963 and are available only intermittently prior to 1980, so the earliest year in which Meyer and Sullivan anchor their measure to the Official Poverty Rate is 1980. As a result, the Consumption Poverty Measure is also unable to evaluate success in President Johnson's War on Poverty. Instead it evaluates progress in a redefined war in which poverty rates in the 1960s were substantially higher. It also does not include the value of health insurance and so does not capture all of the power of government in-kind transfers to increase the resources going to the bottom part of the distribution measured by income or consumption.¹⁶

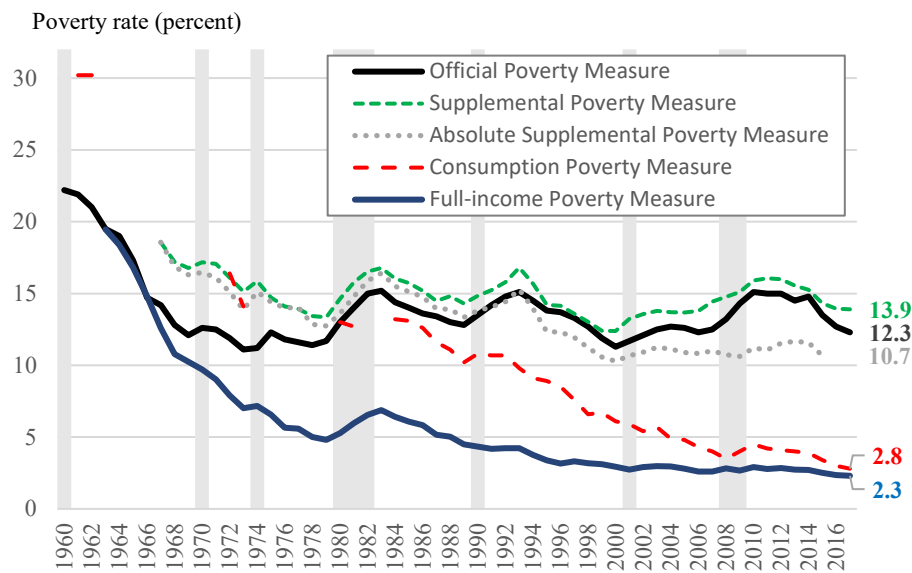
5. Comparison of the Full-Income Poverty Measure to Alternative Measures

Our Full-income Poverty Measure shows lower poverty rates in 2017 than do the other income-based poverty measures because it is designed to evaluate President Johnson's War on Poverty using his standards. This can be seen in Figure 6. The Supplemental Poverty Rate falls from 18.6 percent in 1967, the first year available, to 13.9 percent in 2017. However, recall that the Supplemental Poverty Measure typically increases the poverty thresholds by more than inflation each year. This means that it understates declines in absolute hardship over time. The

¹⁶ Meyer and Sullivan (2012b) show poverty rates under a consumption-based poverty measure that includes a value of health insurance. However, as described in Meyer and Sullivan (2013a), they do so only for families when the market value is equal to at most one third of total expenditures. For other families, health insurance is valued at one-third of total expenditures, which can be much less than the market value for families with low total expenditures or a high value of health insurance.

Absolute-SPM uses the 1967 Supplemental Poverty Measure thresholds and adjusts them only by inflation (using the CPI-U-RS) each year. Hence, it falls somewhat faster—from 18.6 percent in 1967 to 10.7 percent in 2015, the latest year available.¹⁷ But note that in 1967 both the Supplemental Poverty Rate and the Absolute-SPM rate are 4.4 percentage points higher than the Official Poverty Rate. Consequently, both would undoubtedly be considerably lower in 2015 if they had been anchored to the Official Poverty Rate in 1967 or 1963. As a result, these measures both show higher poverty rates in part because they have higher initial levels of poverty.

Figure 6. Percent of population in poverty based on various poverty measures, 1960-2017



Sources: Census Bureau; Fox et al. (2015); Wimer et al. (2017); Meyer and Sullivan (2018); IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors' calculations.

Note: Shading denotes NBER-based recession periods.

Conversely, the Consumption Poverty Rate has fallen more than either the Official Poverty Rate or the Supplemental Poverty Rate. In fact, it also has shown an even greater reduction in poverty than has our Full-income Measure, falling from 30.2 percent in 1961 to 2.8

¹⁷ See Appendix B for our construction of this Absolute-SPM series based on data from Wimer et al. 2017.

percent in 2017. In other words, despite the fact that the Consumption Poverty Rate starts 8.3 percentage points higher than the Official Poverty Rate in 1961 (thus likely exceeding the Official Poverty Rate in 1963 as well), it still reaches a poverty rate of under 3 percent by 2017.

As we will explore further below, the steep downward trend in the Consumption Poverty Rate relative to these other measures occurs in large part because it uses the Meyer-Sullivan adjusted CPI-U-RS inflation measure which increases the poverty line slower than either the CPI-U-RS or the PCE inflation series (thereby also increasing poverty reductions). The downward trend in the Consumption Poverty Rate may also reflect the focus on consumption, which may be less subject to increased underreporting of welfare benefits or other sources of income over time. However, the sharp decline in the Consumption Poverty Rate also comes despite its omission of the value of health insurance including Medicaid and Medicare, which are included in our Full-income Poverty Measure. Nevertheless, despite these differences, the decline in the Consumption Poverty Rate lends support to the results from our Full-income Poverty Measure that existing income-poverty measures fail to capture the success in President Johnson's War on Poverty.

Given the stark differences in trends between our Full-income Poverty Measure and other poverty measures, a natural question is what drives these differences. To explore this question, we produce a modified version of our Full-income Poverty Measure to allow for a consistent comparison with the Absolute-SPM and the Consumption Poverty Measure. First, since data used to produce the Absolute-SPM and the Consumption Poverty Measure are not available in 1963, we anchor all three measures to the same base year of 1980. Second, we also exclude the market value of health insurance from the modified Full-income Poverty Measure, since it is excluded in the other measures. Third, we update poverty thresholds using a single common

measure of inflation. Again, based on limitations of available data for the Consumption Poverty Measure and the Absolute-SPM, we use the CPI-U-RS and the Meyer-Sullivan adjusted CPI-U-RS rather than our preferred PCE inflation series. Since the CPI-U-RS has a slower rate of inflation than the PCE and the Meyer-Sullivan adjusted CPI-U-RS has a faster rate of inflation, this offers two extreme cases for inflation trends.

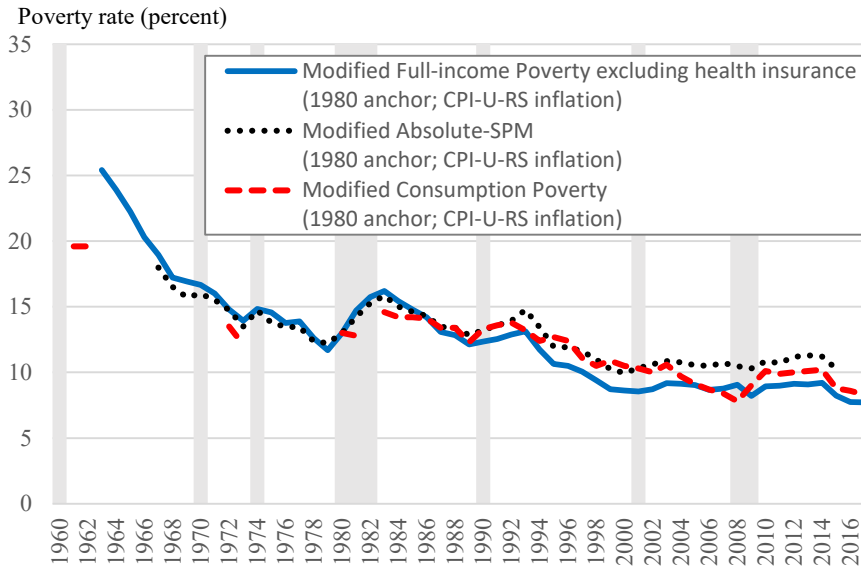
These comparisons will yield two important takeaways. First, the inclusion of the market value of health insurance in the Full-income Poverty Measure, the 1963 anchor year, and the use of the PCE to adjust for inflation appear to explain the major differences in poverty trends under this measure relative to the absolute-SPM and the Consumption Poverty Measure. Other differences such as the sharing unit, equivalence scale, geographic adjustments, and the deduction of certain expenses do not appear to be as important. Second, while income and consumption-based poverty measures lead to similar poverty trends when poverty rates do not fall too low, the poverty rate under consumption-based measures may diverge when poverty rates reach very low levels. Given Meyer, Mok, and Sullivan's (2015) finding that income at the very bottom tail of the distribution is underreported in the CPS, this may suggest that the 2.3 percent Full-income Poverty Rate in 2017 is somewhat overstated if this underreporting is the cause of the remaining discrepancy.

The modified Consumption Poverty Measure presented here matches the Consumption Measure from Figure 6 that anchors the poverty rate in 1980 to match the Official Poverty Rate, but uses the CPI-U-RS instead of the Meyer-Sullivan adjusted CPI-U-RS as its inflation measure. This series is provided directly by Meyer and Sullivan (2018), who offer multiple inflation measures and anchor years for their poverty measure.

To create the modified Absolute-SPM, we create poverty thresholds in 1980 for each family type and housing type that are not geographically adjusted. We then grow these geographically unadjusted thresholds with inflation in each year. Next, we apply geographic adjustments to these thresholds. Finally, we rescale the thresholds in all years by a constant factor so that the poverty rate under the modified Absolute-SPM in the base year of 1980 is equal to the Official Poverty Rate that year. The poverty rate is calculated as the percent of the population whose Supplemental Poverty Measure resources fall below these thresholds. See Appendix B for further details on how we constructed this measure.

Figure 7 shows the modified Full-income Poverty Measure (without the market value of health insurance), absolute-SPM, and Consumption Poverty Measure, all anchored to the Official Poverty Rate in 1980 and adjusting thresholds for inflation using the CPI-U-RS. In 1980, the poverty rate under all three measures is by definition equal to 13.0 percent, the Official Poverty Rate in that year. In 2015, the poverty rate is 8.2 percent under the modified Full-income Poverty Measure vs. 10.3 percent under the modified Absolute-SPM. On the basis of Figure 7, the remaining differences between them (aside from the anchor year, inflation measure and inclusion of the market value of health insurance that we focus on this paper) do not appear to explain substantial differences in poverty trends. This is even more the case with respect to the modified Full-income Poverty Measure and Consumption Poverty Measure. Once they both use the same anchor year (1980), inflation measure (CPI-U-RS), and exclude health insurance, their poverty trends since 1980 are almost identical (8.2 percent vs. 8.8 percent in 2015). However, they do diverge in earlier years with the modified Full-income Poverty Measure showing greater poverty reduction than the Consumption Poverty Measure prior to 1980, and especially from the early 1960s through 1972.

Figure 7. Poverty rate based on various poverty measures anchored to Official Poverty Measure in 1980, using the CPI-U-RS, 1961 to 2017

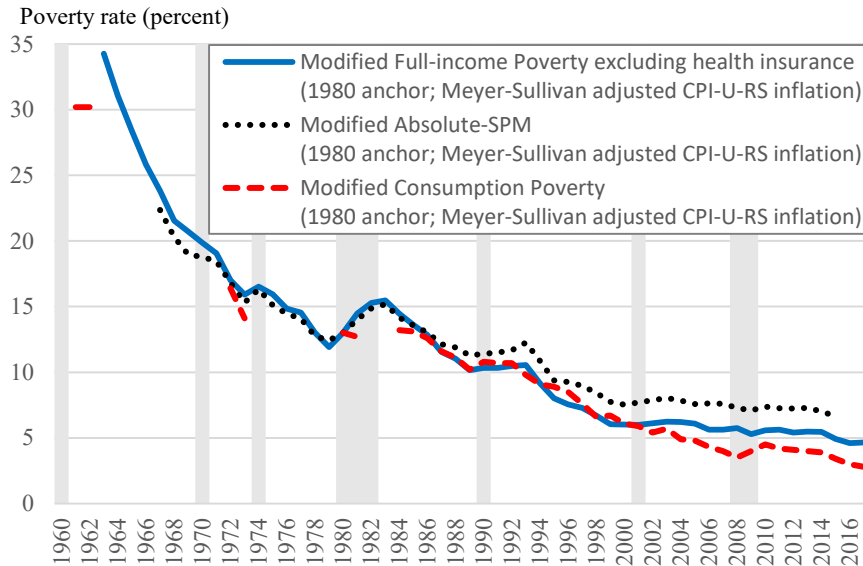


Sources: Wimer et al. (2017); Meyer and Sullivan (2018); IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors' calculations.

Note: Shading denotes NBER-based recession periods. SPM denotes Supplemental Poverty Measure.

This comparison of poverty trends differs somewhat when using an inflation measure that produces lower rates of poverty for all three measures. In Figure 8 we report the results of a similar exercise except that all three measures use as an inflation measure the Meyer-Sullivan adjusted CPI-U-RS instead of the unadjusted CPI-U-RS. Here the decline in poverty using the modified Absolute-SPM and the modified Full-income Poverty Measure is less pronounced than the poverty rate based on consumption since 2000. By 2015, the CPM is 3.4 percent, while the modified Full-income Poverty Measure is a higher 4.9 percent and the modified Absolute-SPM is even higher at 6.6 percent. This suggests that measuring poverty based on consumption rather than income could have more important implications for the poverty rate when reaching the lowest points of the resource distribution. This may be a result of the increasing extent of underreporting of transfers in the CPS-ASEC since 2000, or it could reflect relatively higher spending than income for the very lowest-income households.

Figure 8. Poverty rate based on various poverty measures anchored to Official Poverty Measure in 1980, using the Meyer-Sullivan CPI-U-RS, 1961 to 2017



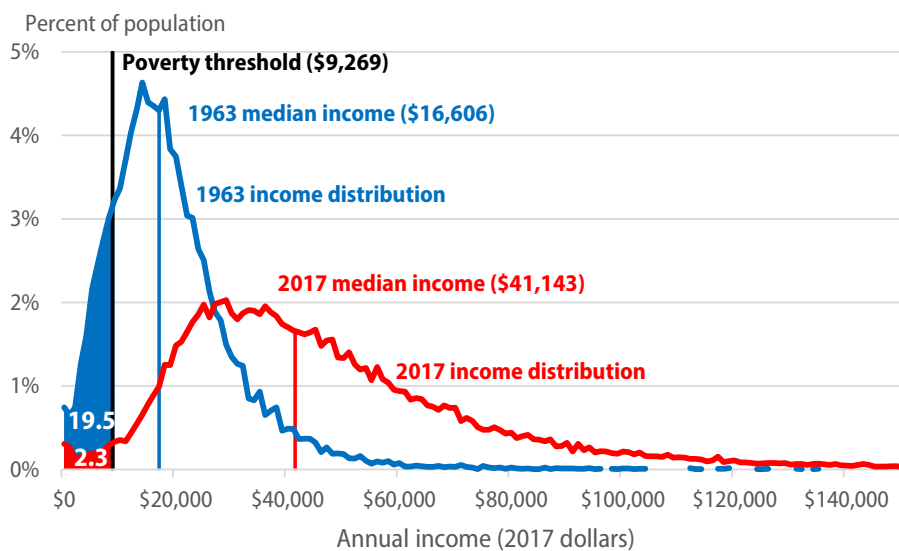
Sources: Wimer et al. (2017); Meyer and Sullivan (2018); IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors’ calculations.
 Note: Shading denotes NBER-based recession periods. SPM denotes Supplemental Poverty Measure.

6. Discussion

These results demonstrate that even though there remain individuals who are struggling financially based on today’s living standards, President Johnson’s War on Poverty—based on economic standards when he declared that war—is largely over and a success. This observation is apparent using our Full-income Poverty Measure since, unlike previous poverty measures, it is anchored to President Johnson scientifically arbitrary but policy relevant judgment with respect to the poverty population in 1963 and sets its initial thresholds accordingly. It also adjusts these nominal thresholds each year to hold them constant in real terms, and uses a full measure of real income. While this conclusion stands in stark contrast to conventional wisdom (and the poverty rates based on the Official and Supplemental Poverty Measures), it should not be surprising given the substantial resources contributed to transfer programs that are not counted by other poverty measures, as well as the overall economic growth that has occurred since the 1960s.

This broad economic growth can be seen in Figure 9, which shows the distribution of full household size-adjusted income (i.e., PCE inflation-adjusted disposable income including cash and in-kind transfers plus health insurance) across all individuals in 1963 and in 2017. The entire distribution has moved far to the right (exhibiting first order stochastic dominance), reflecting substantial real income gains (including transfers) throughout the income distribution over the past five decades.

Figure 9. Individual-level household size-adjusted full-income distribution, 1963 and 2017



Source: IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors' calculations.

Note: Income in 1963 is inflation-adjusted to 2017 dollars based on the PCE price index. The poverty threshold is calculated such that 19.5 percent of individuals in 1963 have a size-adjusted income that falls below it—\$9,269 in 2017 dollars. Incomes are size-adjusted using the square-root of household size. Income levels above \$150,000 are not shown.

Median size-adjusted full-income for an individual more than doubled (increasing by 148 percent) from \$16,606 in 1963 to \$41,143 in 2017. This reflects an increase from \$33,212 to \$82,286 for a household of four. In 2017, only 2.3 percent of people remain below a real poverty threshold based on an absolute standard level of household size-adjusted income established in 1963 as reported previously in Figures 2 and 5. These observations reflect the substantial

economic progress that the United States has made since 1963 both at the median and in the lower part of the distribution once our anti-poverty tax and transfer programs are more fully included in our measure of income.

Nonetheless, societal views on poverty evolve over time. In 1971, Robert Lampman observed that “by present-day American standards most of the several billion people who have ever lived, and most of the three billion people alive today, were or are poor” (Lampman 1971, p. 51-52). He also suggested that the goal of eliminating poverty based on these initial standards “should be achieved before 1980, at which time the next generation will have to set new economic and societal goals, perhaps including a new distributional goal for themselves” (p. 53).¹⁸

The near elimination of poverty based on standards from more than half a century ago is, therefore, an important but insufficient indication of progress toward today’s higher minimum standards. Hence, policymakers now might want to consider adjusting poverty thresholds to reflect current expectations of minimum living standards using academics and policy advisers to provide insights into these revisions. It is likely that these poverty standards policymakers establish will exceed those initially set in 1963.

But from a policy evaluation perspective, the success of President Johnson’s War on Poverty should reflect the goals of policymakers of that era. The Supplemental Poverty Measure fails to capture the full extent of progress. This is because that measure of poverty, based largely on the recommendation of the National Academy of Sciences Panel in 1995 (Citro and Michael 1995), changed the terms of the War on Poverty by arbitrarily increasing the initial poverty

¹⁸ Fisher similarly extends this concept backwards, observing that “families in 1907 with constant-dollar incomes equivalent to 92 percent of Orshansky’s poverty threshold were described as ‘liv[ing] well’” but that “[i]n 1965 – and even more so in 1993 – no reasonable person would describe a family with that real income as ‘living well’” (Fisher 1994, para. 19).

thresholds established in 1963 and adjusting these thresholds over time using a quasi-relative rather than an absolute standard over time. John Cogan made some of these same fundamental points in his dissent contained in the National Academy of Sciences Panel in 1995:

“I dissent because the report’s recommendations—to choose three particular commodities upon which to base the calculation of poverty and to exclude other commodities; to establish a normative range of values within which the poverty line should fall; to increase the poverty line over time to account for perceived improvements in the standard of living; and to exclude medical expenses from family resources—are the outcome of highly subjective judgements. These are judgements that do not result from scientific inquiry and, therefore, in my opinion, are improperly placed in this report” (Citro and Michael 1995, p. 390).

Cogan’s criticism of the National Academies of Sciences report is accurate, since baseline poverty thresholds are a normative decision. The same is the case with respect to the decision to change those thresholds using absolute or relative standards. Consequently, while the Supplemental Poverty Measure can offer insights into the relative economic situation of low income individuals, it was never intended to fully evaluate absolute poverty trends over time as initially envisioned when the War on Poverty was established.¹⁹ Our Full-income Poverty Measure fills this gap and shows that the War on Poverty based on President Johnson’s standards is largely over and a success.

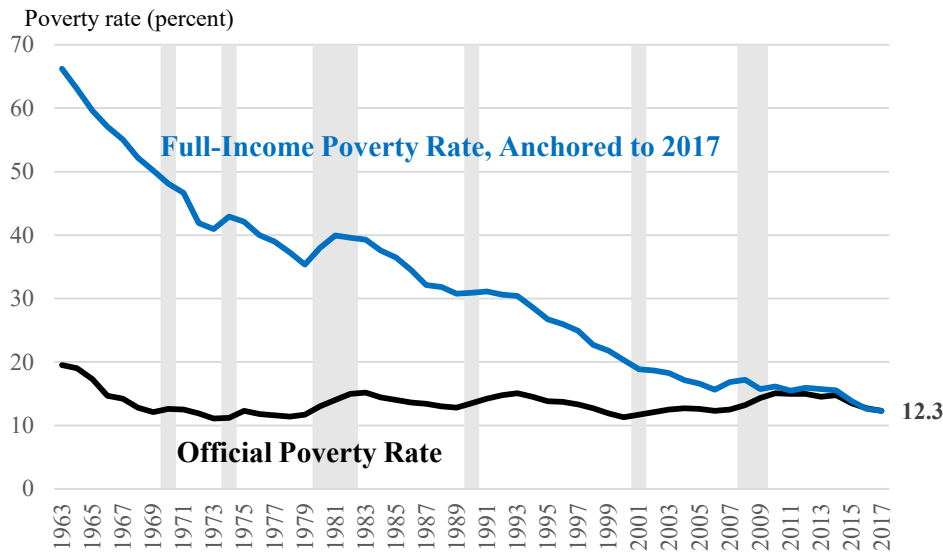
Nevertheless, the dramatic reduction in poverty by 2017 based on President Johnson’s standards suggests that policymakers might consider setting new poverty thresholds that reflect modern-day expectations for what it means to be impoverished. Although even if policymakers

¹⁹ In hindsight, the National Academy of Sciences Panel could have anchored their proposed poverty measure alternatives to the Official Poverty Measure’s 19.5 percent approximation of President Johnson’s concern for the one fifth of Americans who lived in poverty in 1963 and more accurately determined its success in reducing poverty based on his terms of engagement. They could then have more transparently argued, based on that success, for an increase in its thresholds for a new generation as Lampman expected. For example, the quasi-relative poverty measure developed by the panel could have adjusted the definition of moderate expenditure households based on a different point in the basic expenditure distribution, or it could have changed the multiplier applied to their purchases of basic goods, such that the poverty rate in 1963 under the new measure was equal to 19.5 percent. Then they could have showed how their more sophisticated measures of poverty would have more accurately measured poverty trends over time using both an absolute standard and their quasi-relative ones.

reconsider the standards for poverty, it will still be true that the poverty rate using an absolute standard is far below where it stood in the 1960s at the start of President Johnson’s War on Poverty.

For example, one could consider the current 12.3 percent Official Poverty Rate in 2017 to be the appropriate poverty rate based on today’s living standards. Under this approach, Figure 10 shows an alternative Full-income Poverty Measure that is anchored to the 12.3 percent poverty rate under the Official Poverty Measure in 2017. By this standard, the Full-income Poverty Rate fell from 66.2 percent in 1963 to 12.3 percent in 2017. Over half of the U.S. population has been lifted from poverty since 1963 based on this modern poverty standard. Consequently, even if today’s standards are preferred, this should not discount the progress made in reducing poverty over the past half-century.

Figure 10. Poverty rate based on Official Poverty Measure and Full-Income Poverty Measure anchored to 2017, 1963 to 2017



Source: IPUMS and NBER CPS data; Advisory Commission on Intergovernmental Relations (1968); BEA; BLS; Census Bureau; CMS; Collinson et al. (2016); Hoynes et al. (2016); Kramer (1988); MACPAC; NBER TaxSim; NHEA; OMB; USDA; Authors’ calculations.

Note: Shading denotes NBER-based recession periods.

7. Conclusion

When evaluated based on President Johnson's initial 1963 standards, we find that the poverty rate fell from 19.5 percent in 1963 to 2.3 percent in 2017. The low Full-income Poverty Rate today suggests that even though there remain individuals who are struggling financially based on today's living standards, President Johnson's War on Poverty based on absolute 1960s living standards is largely over and a success. We reach this conclusion by using his initial assessment that 20 percent of people were poor in 1963, holding future poverty thresholds constant in real terms, and, importantly, including as resources the programs used to fight this war.

This result reflects the substantial improvements in full-income throughout the distribution and the creation and expansion of major safety net programs, with median income more than doubling between 1963 and 2017. It is also broadly consistent with the expectations of President Johnson and his advisers, including Robert Lampman who predicted in 1971 that poverty based on these initial standards would be eliminated by 1980. Nevertheless, this finding stands in contrast to existing poverty measures that attempt to assess progress in President Johnson's War on Poverty based on different standards that effectively redefine his terms of engagement.

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Appendix A. Imputing income sources

The CPS-ASEC contains for each survey respondent the receipt and market value of in-kind transfers including Medicaid, Medicare, food stamps, housing subsidies and school lunch beginning in income year 1979 (survey year 1980).²⁰ It also includes the value of employer provided health insurance beginning in 1979. However, the receipt and value of these income sources are not available in the CPS-ASEC between 1963 and 1978. Thus, we impute both receipt and values of these income sources for each year between 1963 and 1978. To do so, we use an array of data sources on the number of recipients, total spending, and program rollout (Census Bureau 1965; Advisory Commission on Intergovernmental Relations 1968; Census Bureau 1970; Kramer 1988; Gruber 2003; CMS 2013; Collinson et al. 2016; Hoynes et al. 2016; Medicaid and CHIP Payment and Access Commission 2018; USDA 2018; CMS 2019; OMB 2019; USDA 2019). The methodology for imputing receipt and values for each income source follows.

Medicare

Receipt

Medicare was first implemented in 1966, initially covering Americans age 65 and over. Thus, we impute Medicare receipt in 1966-1978 to all adults age 65 and over.

Medicare coverage was expanded to nonelderly adults receiving Social Security Disability Insurance (SSDI) in 1973. Thus, we also impute Medicare receipt to some adults under the age of 65. In order to impute which nonelderly adults received Medicare as a result of SSDI coverage in 1973 through 1978, we first identify all adults age 18 to 61 who received

²⁰ Since income year 2014, the Census Bureau no longer includes the market value of Medicaid and Medicare in the CPS-ASEC. However, it continues to make available instructions for data users to calculate these values.

Social Security income in each year. We exclude adults age 62, 63, and 64 because Social Security income may have been retirement rather than disability income. However, even among adults age 18 to 61 who receive Social Security income, not all would have received Medicare coverage, for at least three reasons:

1. Widows between the ages of 60 and 61 received Social Security income but were not covered by Medicare.
2. SSDI recipients were not eligible for Medicare coverage until receiving SSDI for 24 months.
3. Some respondents who report receiving Social Security income between the ages of 18 and 61 may have actually received Supplemental Security Income or a disability benefits from a private entity or state or local government but misreported as receiving Social Security Income.

We address the first issue by never assigning Medicare coverage to female widows between the ages of 60 and 61. We address the second and third issue by assigning Medicare coverage probabilistically to adults between the ages of 18 and 61 (but not widows age 60 or 61) who report receiving Social Security income.²¹ Probabilities are estimated based on the CPS-ASEC data for income year 1979, which contains information on Social Security income receipt, Medicare receipt, and other respondent characteristics. Specifically, our sample for estimating probabilities is all adults age 18 and 61 who are not widows age 60 or 61 and who report receiving Social Security income in 1979. We estimate a probit model. The outcome variable is whether or not the adult received Medicare coverage in 1979, and the predicting variables include sex, race, education, age and marital status.

²¹ We assign coverage probabilistically instead of assigning coverage to those with the highest probabilities in order to more accurately capture the distribution of recipients, as described by Mittag (2019).

We then apply the model estimates based on the CPS-ASEC for 1979 to the survey respondents in 1973-1978 who were between the ages of 18 and 61 (but not widows age 60 or 61) and reported receiving Social Security income. In particular, we predict the probability of Medicare coverage for each respondent on the basis of his or her characteristics, using the probit model estimates obtained from the 1979 data.

Next, we use the predicted probabilities of each Social Security recipient in 1973-1978 to assign Medicare coverage. For each year, we randomly select individuals according to these probabilities as receiving Medicare coverage until the number of imputed Medicare recipients matches the adjusted total number of disabled Medicare recipients according to administrative data. The adjusted administrative total is equal to the administrative total number of disabled Medicare recipients in each year from 1973-1978, multiplied by the ratio of the number of disabled Medicare recipients identified in the CPS-ASEC in 1979 to the number of disabled Medicare recipients based on administrative data in 1979. This adjustment makes coverage of disabled Medicare recipients in earlier years of the CPS-ASEC consistent with coverage in 1979.

Value

We next estimate the market value of Medicare coverage for CPS-ASEC respondents in 1966-1978. To do so, we first obtain the market value of Medicare for aged and disabled Medicare recipients by State in the CPS-ASEC for income year 1979. We apply these 1979 values to CPS-ASEC respondents who we imputed as receiving Medicare coverage in 1966-1978, according to their risk class (aged or disabled) and State of residence. One complication is that between 1967 and 1975, the CPS-ASEC does not provide the exact state of residence for some respondents, instead providing only a group of states in which they might live. In these cases, we assign the population-weighted (according to the 1970 U.S. Census) average of market

values across States in the group of States provided, for the appropriate risk class of the respondent.

Finally, we scale down the Medicare values assigned to all Medicare recipients in 1966-1978 based on average per-recipient Medicare spending each year relative to average per-recipient Medicare spending in 1979. We obtain average per-recipient Medicare spending each year by dividing U.S. spending on Medicare from the National Health Expenditure Accounts by the number of Medicare enrollees in each year according to administrative data.

Medicaid

Receipt

Medicaid was first implemented in some states beginning in 1966. When a given state implements Medicaid, we assign Medicaid coverage to all members of families living in that state who receive cash welfare (generally Aid to Families with Dependent Children or AFDC) or Supplemental Security Income (SSI), except for family members age 18 or above who were not covered by AFDC or SSI. Because we cannot identify cash welfare receipt until 1967, we do not impute Medicaid coverage to any respondents in 1966.

One complication of assigning Medicaid coverage based on the year in which each state implements Medicaid is that some respondents are not assigned to a unique State code between 1967 and 1975 of the CPS-ASEC, as noted above. Since we cannot identify the specific State in which such respondents reside, we cannot determine the year in which such respondents could first access Medicaid coverage. Thus, we assign Medicaid coverage to these respondents probabilistically according to the population of each state (according to the 1970 Census) in the group and whether each state had implemented Medicaid. Specifically, if respondent i lives in the group of states $\{S_1, S_2, \dots, S_N\}$, then his or her probability of coverage $P_{i,t}$ in year t is given by

$$P_{i,t} = \sum_{j=1}^N \alpha_j M_{j,t}$$

where α_j is the population share of state j among the group of N states, and $M_{j,t}$ is an indicator variable equal to one if state j implemented Medicaid by year t .

Value

We next estimate the market value of Medicaid coverage for 1967-1978. To do so, we first obtain the average market value for aged, adult and child Medicaid recipients by state in 1979 according to the CPS-ASEC for income year 1979. We do not consider the disabled as a separate risk class because prior to 1976, the CPS-ASEC does not ask about SSI receipt separately from AFDC receipt. We then apply these 1979 market values to respondents who were imputed to receive Medicaid coverage in 1967-1978. Just as with our procedure for Medicare values, we assign state population-weighted averages of Medicaid values for recipients with non-unique State codes.

Finally, we scale down the Medicaid values assigned to all Medicaid recipients in 1967-1978 based on the ratio of average per-recipient Medicaid spending each year to average per-recipient Medicaid spending in 1979. We obtain average per-recipient Medicaid spending each year by dividing U.S. spending on Medicaid from the National Health Expenditure Accounts by the number of Medicaid enrollees in each year according to administrative data.

Employer provided health insurance

Receipt

We impute receipt of employer provided health insurance coverage for 1963-1978. To do so, we first use a probit model to predict coverage for each family in 1979, the earliest year for which employer provided health insurance values are available. The outcome variable is whether

anyone in the family receives employer provided health insurance. The predicting variables include the number of workers in the family, as well as the family head's age, sex, race, education, marital status, and part or full-time work status. Next, we use the model estimates to predict probabilities of family receipt of employer provided health insurance coverage in 1963-1978. We assign receipt probabilistically until reaching our estimate of the number of people covered by employer provided health insurance in each year.

In addition to imputing who is covered by employer provided health insurance, we must also estimate the number of people covered because, to our knowledge, such data are not available for 1963-1979. To estimate the number of people covered, we first obtain total spending on private health insurance each year from the NHEA in 1963-1979. We adjust total spending downward in 1963-1978 based on the ratio of employer provided health insurance spending in CPS-ASEC for 1979 to NHEA spending on private insurance in 1979. This ensures that we capture the same fraction of total spending in 1963-1978 as captured by the CPS-ASEC for income year 1979. Next, we obtain an estimate of average spending per recipient in 1963-1978. We do so by calculating the average spending per recipient in 1979 using the values in the CPS-ASEC for income year 1979, and then deflating this average value each year from 1963 to 1978 according to the CPI for health expenditures. While there is no reason to believe that average spending per recipient necessarily increased at the same annual rate as the CPI for health expenditures, we are unaware of a superior approach to estimating these average values.

In order to obtain our estimate of the number of people covered by employer provided health insurance in the CPS-ASEC, we simply divide the adjusted total private health expenditures each year by our estimate of the average spending per recipient. We then assign

employer provided health insurance coverage to families probabilistically until reaching our estimate of the number of covered individuals in each year.

Value

We next estimate the value of employer provided health insurance coverage for each recipient in 1963-1978. To do so, we estimate a linear model that predicts the total market value of employer provided health insurance for families in the CPS-ASEC for income year 1979. The outcome variable is the total value of employer provided health insurance across all family members in each family. The predicting variables include the number of adults in the family, the number of children in the family and the family's state of residence.

We use the model estimates to predict the total family value of employer provided health insurance in 1963-1978. We assign populated-weighted averages of values for recipients with non-unique State codes. The value for each individual person is then deflated according to the CPI for health expenditures in each year relative to 1979.

Food Stamps

Receipt

We impute food stamp receipt for families in 1963-1978. To do so, we first use a linear probability model to predict food stamp receipt by families in the CPS-ASEC for income year 1979, the earliest year food stamp receipt is available. The outcome variable is whether or not the family received food stamps. The predicting variables include the number of adults in the family, the number of children in the family, and the family head's age, sex, race, marital status, and family income. In a separate model we also include whether the family receives cash welfare.

Next, we use the model estimates to predict probabilities of family receipt of food stamps in 1963-1978. For 1967-1978, we use the model that includes cash welfare receipt as a predicting

variable because the 1967-1978 CPS-ASEC files include information on whether the family received cash welfare, while the 1963-1966 CPS-ASEC files do not include this information.

We then scale the predicted probabilities for 1963-1978 because the food stamp program was implemented in different counties in different years. We identify the implementation year for each county from data published by Hoynes et al. (2016). Since we do not know the county of residence for each CPS-ASEC family, we instead scale each family's predicted probability of food stamp receipt by the share of the state's overall population contained in counties that had implemented the food stamp program by the given year. Our county-level population data come from the 1970 Decennial Census. For individuals with non-unique state codes, we use state population-weighted averages of state population shares covered by counties that had implemented the food stamp program.

Finally, we assign food stamp coverage to families probabilistically according to their predicted probabilities until reaching the adjusted administrative total number of food stamp enrollees in the United States. The adjusted administrative total is equal to the actual administrative total multiplied by the ratio of the number of food stamp recipients in the CPS-ASEC for income year 1979 to the number of food stamp recipients recorded in administrative data for 1979.

Value

We next estimate the value of food stamps for each recipient family. To do so, we first estimate a linear model using the CPS-ASEC for income year 1979. The sample for this model is all families that received food stamps in 1979. The outcome variable is the total value of food stamps the family received. The predicting variables include the number of adults, the number of

children, and the family's (pre-tax, post-cash transfer) income. We also include interactions between the number of adults and children with a 3rd degree polynomial of the family's income.

We then use these estimates to predict the value of food stamps received by each family that was imputed to receive food stamps in 1963-1978. We replace any food stamp value below the 5th percentile of actual food stamp values in 1979 with the 5th percentile, and we replace any food stamp value above the 95th percentile of actual food stamp values in 1979 with the 95th percentile. In addition, we scale the value of food stamps for each family in 1963-1978 such that the total amount of food stamp value across all families is equal to adjusted total food stamp spending in that year from administrative data. The adjusted total food stamp spending in each year from 1963-1978 is equal to the total spending from the administrative data multiplied by the ratio of total food stamp value in the CPS in 1979 to total food stamp spending in 1979 according to administrative data.

School lunch

School lunch coverage and values are imputed identically to the way Food Stamp coverage and values are imputed, with one exception: School lunch was available in every State in each year during 1963-1978, and so we do not scale probabilities based on county-level implementation dates.

Housing subsidies

Housing subsidies are imputed identically to the way school lunch coverage and values are imputed, with one exception: We only have data on the number of family units covered by housing subsidies rather than the number of recipients who live in those households. Thus, we match the number of families in the CPS-ASEC to the number of assisted families according to

administrative data (scaled based on the ratio of families in the CPS-ASEC in 1979 to those reported in administrative data in 1979).

Appendix B. Anchoring the Absolute-SPM to the Official Poverty Measure

In order to create an anchored version of the Absolute Supplemental Poverty Measure, we create SPM poverty thresholds in the base year for each family type and housing type that are not geographically adjusted. We then grow these geographically unadjusted thresholds with inflation in each year. Next, we apply geographic adjustments to these thresholds. Finally, we rescale the thresholds in all years by a constant factor so that the poverty rate under the SPM in the base year is equal to the poverty rate under the anchor poverty measure in the base year. The poverty rate is calculated as the percent of the population whose SPM resources fall below these thresholds.

In order to create the anchored SPM thresholds, we use the SPM data made publicly available by Wimer et al. (2017). The individual-level data, based on the Current Population Survey–Annual Social and Economic Supplement (CPS-ASEC) and the Consumer Expenditure Survey, can be used to calculate a historical SPM for each year between 1967 and 2015. For each individual in each year, the SPM data provide the geographically adjusted poverty threshold, the geographic adjustment which is applied to the housing portion of the threshold, as well as resource variables.

Create geographically unadjusted thresholds in base year. We begin by noting that the overall, geographically adjusted poverty threshold can be written as the sum of the geographically adjusted housing portion of the threshold and the non-geographically adjusted remaining portion of the threshold:

$$T_{f,h,r,t} = A_{r,t}H_{f,h,t} + N_{f,h,t}$$

for family type f , in housing type h , in region r in year t , and where T is the overall geographically adjusted poverty threshold, A is the geographic adjustment, H is the unadjusted housing portion of the threshold, and N is the non-housing portion of the threshold. The SPM data provide T and A , but not H and N . Thus, we solve for H and N by combining threshold equations for two families with the same number of adults and children in the same housing type during the base year, but who live in different regions and thus have different geographic adjustment factors A . Denoting a family with two adults and two children as family type $f=0$, denoting the base year as $y=0$, and considering two distinct regions as $r=1$ and $r=2$, we can solve for the unadjusted housing portion for all families of type $f=0$ during year $y=0$ as

$$H_{0,h,0} = \frac{T_{0,h,1,0} - T_{0,h,2,0}}{A_{1,0} - A_{2,0}}$$

for each housing type h . We then obtain the geographically unadjusted poverty threshold as

$$T_{0,h,0} = T_{0,h,r,0} + H_{0,h,0}(1 - A_{r,t})$$

We then apply the SPM equivalence scale to create geographically unadjusted thresholds for each family type and housing type.

Create geographically unadjusted thresholds in all years. We create geographically unadjusted poverty thresholds in all other years by applying the appropriate inflation adjustment.

We obtain

$$T_{f,h,t} = \frac{P_t}{P_0} T_{f,h,r,0}$$

where P_t is the price index in year t .

Create geographically adjusted thresholds in each year. We next apply geographic adjustments to the poverty thresholds in each year. Because the geographic adjustment factors

apply only to the housing share of the thresholds, the geographically adjusted poverty thresholds are given by

$$T_{f,h,r,t} = T_{f,h,t}(s_{h,t}A_{r,t} + (1 - s_{h,t}))$$

The housing share of the threshold is constant across all family types in a given year and given housing type, and so

$$s_{h,t} = \frac{H_{0,h,t}}{T_{0,h,t}}$$

which can be calculated as shown in the base year.

Rescale poverty thresholds to anchor in base year. The final step is to multiply all geographically adjusted poverty thresholds in all years by a constant factor such that the poverty rate under the SPM is equal to the appropriate poverty rate in the base year.