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A COMPARISON OF POVERTY TRENDS AND POLICY IMPACTS FOR WORKING FAMILIES USING DIFFERENT POVERTY INDEXES

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Abstract

This study provides empirical evidence on recent trends in poverty among working families based on the headcount rate and a broader alternative that incorporates the headcount rate, the depth of poverty, and income inequality among the poor. Estimates reveal that the indexes produce significantly different trends. The headcount rate indicates a reduction in overall working poverty for the sample period, while the alternative index showed no statistically significant change. The same result was found for various population subgroups. Decompositions of the index changes show that tax changes contributed to lower values for both the headcount rate and the alternative index, largely due to recent expansions of the earned income tax credit. Changes in transfer payments added to measured poverty, mirroring the retrenchment of welfare and other transfer programs. Shifts in market-based income decreased both indexes.

Keywords: Poverty, inequality, working poor, poverty measurement, anti-poverty policy.

INTRODUCTION

This paper examines how economic and policy changes during the 1990s affected the degree of poverty among working families in the United States. As will be discussed, the decade is especially interesting because in that period a variety of important market-based and policy-related changes that potentially affected the financial positions of less-skilled, low-income workers took place.

The study has two basic aims. First, it seeks to measure changes in the extent of poverty among working families during the 1990s. This is done using two different poverty indexes. One is the official poverty headcount rate, the index used in most analyses and policy discussions. While well known, the official measure has several recognized shortcomings that can mischaracterize, perhaps substantially, the degree of poverty in general and among working families in particular. The study thus introduces a second poverty index that remedies the most important of these problems, allowing a more meaningful assessment for policy and other purposes. Second, the study intends to identify the separate effects that changes in the market economy, tax policy and government transfer programs had on the measured trends in working poverty. For comparative purposes, estimates are developed for both poverty indexes.

The new evidence presented here complements a growing interest in the condition of the working poor evident in academic and policy circles, as well as in the popular press. In their review article on urban poverty, for instance, Small and Newman [47] contend that "research on the working poor should come to the fore in light of recent welfare reform and the growth of the low-wage labor market" (p. 39). Meanwhile the

recent successes of books such as Barbara Ehrenreich's *Nickel and Dimed* [17] and David K. Shipler's *The Working Poor* [46] highlight a more widespread awareness.

In part, attention has been focused by basic concern for the welfare of vulnerable populations. It has also been heightened by a strong adherence to the broader American ethos that hard work equals success. That is to say, signs that work is losing its potency as a method of escape from poverty would challenge a core element of the country's value system. They would also dispute a key assumption that has driven retrenchments in social safety net programs, such as the 1996 welfare reforms, and other initiatives such as job readiness and school-to-work transition programs. The study's findings help inform these and other related issues.

THE ECONOMY OF THE 1990s

The economy of the 1990s provides an interesting and valuable context in which to study trends in working poverty. Developments in private-sector activity as well as significant policy actions influenced the pay of less-skilled workers in sometimes conflicting ways, leaving their net impact open to question. Indeed, the uncertain impact of the various forces on working poverty and a desire to understand their relative effects are basic motivations for this study.

Table 1 contains various macroeconomic indicators for the years 1991 and 2002. At the aggregate level, the U.S. economy grew at a robust rate for most of the decade, following a relatively short recession at the beginning. Growth was especially strong in the latter half of the period. Inflation-adjusted gross domestic product, for example, grew 3.2 percent per year from 1991 to 2002, while inflation was low and relatively steady,

averaging about 2.6 percent per year. The overall labor market benefited, as the civilian unemployment rate fell from 6.8 percent in 1991 to 5.8 percent in 2002, after hitting a 30-year low of 4 percent in 2000. Commensurate with the tight labor market, real average hourly earnings increased close to 9 percent. At the same time, real corporate profits rose over 48 percent and the stock market reached historic highs, boosting wealth and driving consumer spending.

Exactly why the macro economy performed so well is a matter of some debate, although several factors are mentioned repeatedly. These include beneficial macro policy, such as prudent monetary policy and decreases in the federal budget deficit (from $269.20 billion in 1991 to $157.80 billion), technological innovation in computers and telecommunications, and increased gains from trade associated with globalization [23]. But because the economy's strong growth was underwritten by multiple factors, its impact on less-skilled, low-income workers was mixed.

Table 2 displays data on poverty and income and earnings inequality. As can be seen, the strong economy helped push the overall official headcount family poverty rate down from 11.5 percent in 1991 to 9.6 percent in 2002. However, as will be discussed, the simple headcount poverty rate is not necessarily an adequate gauge of poverty. Other important indicators include the depth of poverty—that is, the difference between a family's income and its poverty threshold income—and the degree of income inequality among the poor. And these elements of poverty measurement deteriorated during the 1991 to 2002 period.

For example, the real average family poverty gap per family member rose from $1,150.51 to $1,290.16, meaning that family members who remained poor were deeper in

poverty than before. These figures concern the overall poverty population but, as we will see, the same trends affected working poor families. Along the same lines, the fraction of the poor in so-called deep poverty—those with an income below 0.5 of the official poverty threshold—rose from 39.4 percent to 40.7 percent.

Concerning income and earnings inequality, a commonly used summary measure is the Gini index. The Gini index takes a value of zero when income or wages are evenly distributed (no inequality) and a value of unity when inequality is maximized. The census data in Table 2 reveal that the Gini index for both household income (including earnings and other payments) and individual earnings rose between 1991 and 2002 (7.9 percent and 15 percent, respectively). Other ways of measuring inequality, such as looking at the ratio of wages for those in the 90^{th} percentile to those in the 10^{th} percentile, lead to the same conclusions [16].

In part, rising inequality reflected the specific technological changes that occurred, which many believe were biased toward those with higher skill and education levels [23]. Consistent with this view, the real hourly wages of workers with less than a high school degree remained unchanged between 1991 and 2002, while the real wages of college educated workers grew by about 18 percent (Table 2). Similarly, the difference in pay between college and high school graduates increased for both men and women from about 59 percent to about 74 percent [16].

Income inequality also increased in the midst of overall growth due to several structural economic changes that occurred in the same period [52]. Increases in immigration, especially by those with relatively low levels of education, probably depressed the wages of less-skilled native workers, although the size of the effect is a

matter of debate (see, e.g., [6] and [10]). Outsourcing of production to low-wage countries had a similar effect. Deunionzation of the workforce continued, thereby eliminating wage premiums associated with union jobs, which are disproportionately higher for less-skilled workers [11]. At the same time jobs became more spatially dispersed, decreasing the access to jobs of less-skilled individuals in urban centers ([51], [55]). In sum, structural and demographic changes in the private sector mitigated and perhaps reversed whatever gains might have accrued to less-skilled individuals from the strong macro economy.

Significant policy changes during the decade also influenced the earnings of low-income workers. The initiatives, ostensibly aiming to promote work and to "make work pay," included a major overhaul of the country's social safety net in 1996. The Aid to Families with Dependent Children (AFDC) program, which provided cash assistance to female-headed families, was transformed into Temporary Assistance to Needy Families (TANF). TANF introduced new work requirements, work incentives, and time limitations for recipients, which affected the poverty rates of less-skilled female heads of families in contradictory ways [4]. Other cash transfer payments and in-kind payments, such as food stamps and housing assistance, also were greatly reduced [12]. The federal government increased the federal minimum wage twice in the decade, in 1991 and 1996; several states increased their minimums as well. Meanwhile, the federal government greatly expanded the earned income tax credit in 1990 and 1993, essentially a wage subsidy for workers earning less than specified income levels. These changes, which are detailed in [12, pp. 808-12], include sizable increases in the tax credit rates, increases in the tax phase-out range, and an expansion of the credit to childless couples. The federal

government also introduced financial incentives for employers to boost hiring in the form of the work opportunity tax credit and welfare-to-work tax credit.

As with private-sector developments, these policy changes had potentially conflicting effects on the poverty rate of less-skilled workers. For instance, the impact on former welfare recipients depends on the income they are able to earn versus the transfer payments they previously received [4]. Also, the earned income tax credit can provide both incentives and disincentives for work [18]. The impact of higher minimum wages on poverty is also unclear; while some workers can receive higher pay, the increases might cause others to work fewer hours or lose their jobs [8]. There is evidence, though, that changes in the minimum wage significantly affect the earnings of women in the lower tail of the distribution [34].

HOW HAVE THE CHANGES OF THE 1990s AFFECTED THE DEGREE OF POVERTY AMONG WORKING FAMILIES?

The remainder of the article focuses on measuring the net impact of the private sector and policy changes on the degree of working poverty. As a first step, the terms "poverty" and "working families" must be carefully defined.

Measuring Poverty

The official Census Bureau method. Poverty in the United States is officially measured by the Census Bureau using an approach developed in the early 1960s ([19], [27], [37], [38], [40], [42], and [53]). The procedure identifies poor individuals by using a set of pre-tax cash income thresholds, varying by family size and composition, intended to gauge the resources needed to purchase a minimally acceptable consumption level.

Thresholds are indexed annually for consumer price inflation, and members of families that fail to receive income at least equal to their threshold are deemed poor. Poor individuals are then aggregated into an overall index of poverty through a simple headcount, with the number reported both as a level and as a fraction of the total population (the headcount rate). The thresholds are adjusted each year by the amount of consumer price inflation. Thus, the U.S. poverty standard remains constant in real terms over time and constitutes an absolute standard disconnected from average living standards.

Problems with the official method. Different aspects of the official procedure have been criticized by academic researchers and policy analysts. One is the set of thresholds that demarcate poverty-level income. The thresholds have been assailed primarily for being too low and not reflecting a minimally decent standard of living. To a lesser degree, some disapprove of the adjustments for family size and composition, claiming they are internally inconsistent [40]. Studies that have used different thresholds have produced different levels of poverty headcount rates, different relative compositions of the poverty population, and different trends ([25] provides a clear discussion of some major alternatives). Nonetheless, the official Census Bureau thresholds have been used in a number of studies regarding the working poor (e.g., [5], [28] and [36]).

The official measure of family income is also considered problematic. The Census Bureau's income definition includes pre-tax private-sector income plus government cash transfer payments. As such, it does not accurately identify the resources available to families for spending. There is widespread agreement that a reasonable measure of disposable family income should net out income taxes (including

payroll taxes) and include not only cash transfers but also the value of in-kind transfers such as food stamps and medical care, which have a cash equivalent (e.g., [7], [25] and [40]). Netting out unavoidable working expenses such as child care and transportation is also viewed as desirable.

Finally, Amartya Sen ([44] and [45]) and others have argued that the simple headcount rate is an inadequate gauge of the extent of poverty because it ignores financial aspects of the poverty population that bear directly on the aggregate degree of deprivation. Useful surveys of Sen's work and the large literature it spawned include ([7], [20], [39], [41], [43], and [56].)

One omitted dimension is the depth of poverty, or how far a family's income has fallen below its poverty threshold. A second is income inequality among the poor, which requires explanation. Suppose that both the headcount rate and the depth of poverty remain unchanged, but that a dollar is taken away from the poorest person and given to the least poor person. The result is greater income inequality among the poor (the ends of the distribution are farther apart). Sen maintains that poverty is worse essentially because the dollar is worth more to the poorest person than to the less poor person ([45]:31). Sen's arguments have been quite influential, and many recent empirical studies have relied on indexes that are sensitive to both factors, in addition to the headcount rate (e.g., [2], [3], [7], [14], [15], [30], [39], [41]).

An alternative poverty measure. This study will use the official procedure to measure poverty, given its prominence in policy discussion and public discourse. However, given the important shortcomings in the official measure, estimates are also generated based on an alternative measure that overcomes some of the key problems.

Specifically, the alternative will rely on an improved definition of family income that subtracts taxes, adds in both cash and in-kind government transfers, and subtracts an amount for work expenses consistent with the recommendations in [12]. It also will incorporate the headcount rate, the depth of poverty, and income inequality among the poor to capture to extent of poverty.

We use the official thresholds even though they are generally thought to be too low. There is no consensus on appropriate levels and exploring the implications of different thresholds would make the analysis unmanageable. Still, by using the official ones, together with an improved income measure, the analysis is highly unlikely to misclassify persons as poor who arguably are not. It can, however, exclude some individuals who arguably are poor. Consequently, the results presented can be interpreted as applying to a large segment of the truly working poor population that includes the most vulnerable individuals who are of most concern to policymakers and the public. Note also that had we chosen higher or alternative thresholds, we would introduce the potential error of classifying too many individuals as poor. In sum, the use of official thresholds represents a prudent if not perfect strategy.

In order to incorporate the average depth of poverty and inequality among the poor, we use the family of poverty indexes developed by Foster, Greer, and Thorbecke [21]. The general form of the index is written as:

$$P_\alpha = \frac{1}{nz^\alpha} \sum_{i=1}^{q} g_i^\alpha \qquad (1)$$

where n is the total number of households rank-ordered in increasing income levels, y_i, z is a predetermined poverty line, $g_i = z - y_i$ is the income shortfall of the i^{th} household, q is

the number of poor households (i.e., for which g_i is greater than zero), and α is a parameter measuring "aversion to poverty", with a higher α indicating greater aversion.

A key attribute of equation (1), particularly for this study, is the range of aggregation procedures that it admits. The specific way by which poor individuals are aggregated depends on α, which for the purposes of this study is set alternatively at 0 and 2. The two indexes produced by the different values for α will be referred to as H (α =0) and P_2 (α =2)

When α =0, equation (1) produces a simple poverty headcount rate, that is, a simple sum of the number of poor individuals divided by the total population. When α =2, the index measures the average squared proportionate poverty gap and incorporates the additional dimensions of poverty discussed by Sen ([44], [45]). This can be seen by rewriting P_2 to illuminate the specific characteristics of the poor population that are imbedded. Letting H signify the headcount ratio as above, q/n; I the average poverty-gap ratio, 1- (μ_z / z), where μ_z is the average income of poor households; and, CV^2 the squared coefficient of variation of income among poor households, the index can be expressed as [21]:

$$P_2 = H \text{ x } [I^2 + (1-I)^2 \text{ x } CV^2]. \qquad (2)$$

Thus, P_2 includes the headcount (H), average poverty-gap ratio (I), and income inequality among the poor (CV^2).

Classifying Individuals and Families as "Working"

Given the approaches to measuring poverty, our measurements require us to identify the subset of the poor who are "working." At issue is the amount of work

required before someone is reasonably classified as working. Unfortunately, the literature has not yet yielded a consensus view.

Some researchers have insisted on a minimum of full-time, year-round work (35 hours a week, 50 weeks a year); others have set the bar lower, including "some experience with jobs and employment over the year [5]." Alternatively, other analysts have recognized the external constraint of involuntary unemployment and have classified someone as a "worker" if they either worked or actively looked for work for some minimum time period. That is, work is interpreted as significant attachment to the labor force, an approach taken by the Bureau of Labor Statistics in their annual review of working poverty (e.g., [24], [33], and [36]). Doing so has a certain appeal, although it theoretically permits someone who never actually worked to be called a worker.

One might try to discriminate among possible definitions for "working" using external criteria such as claims about what constitutes current societal norms concerning work (e.g., [31]) or by referencing the expectations embedded in social policies (e.g., [54]). Similarly, normative judgments about fairness might be invoked (e.g., "One full-time worker should be able to support a family"). Doing so, however, simply displaces the ambiguity to the selection of the external criteria.

Another barrier to consensus has been a difficulty in reconciling the ideas of work and poverty. In particular, work is often thought of as an individual activity, while poverty is considered as a condition besetting a family, which is assumed to share financial resources among members. Kasarda [29] nicely summarizes the issue:

> Because family income is affected by family size, number of family workers and other income sources beside earnings, it may be argued that total family income is not a good criterion to distinguish the working poor. For example, a young adult male who works full time at the minimum

> wage but lives with one of his working parents because he cannot afford to live alone or marry the mother of his child is unlikely to be classified as working poor…

Consequently, he suggests that it might be useful to measure working poverty more as a labor force concept than as a family income concept, and to think in terms of individual "poverty-wage workers" rather than working poor. Others, such as [54], [25] and [26], maintain the emphasis on measuring working poverty in a family context.

Given the inherent ambiguity of the term, no specific definition of working poor will be completely satisfying. This study follows the broad approach taken by the Census Bureau [23] and others, which demands actual employment and conceives of working poverty in a family context, in the same way that poverty in general is conceptualized. Two alternative cutoffs for the minimum number of work hours are used. Adopting two alternatives is one way of dealing with the unavoidable ambiguity and helps to indicate when conclusions are sensitive to the particular definitions used. Both of the criteria result in working poor populations with considerable work effort per adult family member.

In the first, a person is considered a member of the working poor if they are in a family in which the total hours worked by all members at least equals 1,750 a year (35 hours a week, 50 weeks a year), and the family's total income is below its relevant poverty threshold. That is, the family must have the aggregate equivalent of a full-time, year-round worker. It also allows all family income, including non-wage income, to determine poverty status consistent with standard procedures for gauging poverty. This is one of the census definitions [25] and very similar to one offered in [26], which uses

1885 hours.[1] The minimum family cutoff of 1,750 hours results in a working poor population with median hours worked per adult family member equal to 1,364 in 2002. This is the equivalent of over 27 hours per week for 50 weeks for each adult. It represents a substantial amount of work and suggests that the census criterion is meaningful and relevant.

A second, less restrictive, criterion is also used in which a person is considered a member of the working poor if they are in a family in which the total hours worked by all members at least equals 1,050 a year. For concreteness, 1,050 hours can be thought of as working 35 hours a week for 30 weeks a year or 21 hours a week for 50 weeks a year. The definition reasonably captures significant labor market attachment and actual work, but also recognizes the external constraints faced by seasonal workers, single-parents with child-care difficulties that prohibit full-time employment, and unavoidable spells of unemployment. As noted earlier, definitions that require less than full-time employment have been used in the literature (e.g., [25], [33], and [54]). The 1,050 cutoff produces a working poor population with median hours worked per adult family member of 1,300 in 2002, again a substantial work effort.

DATA AND MEASUREMENT ISSUES

The empirical analysis relies on March Current Population Survey (CPS) data covering the years 1991 to 2002. The data are used to compute values of equation (1) for H (α =0) and for P_2 (α =2).

[1] [26] also suggests an approach whereby the cutoff for hours worked depends explicitly on the number of potential adult workers in a family, as does [54].

March CPS data are used because they are the basis for the Census Bureau's official annual estimates of the U.S. poverty headcount rate. The specific period was selected for two reasons. Beginning with the 1991 data, the March CPS continuously included information on taxes paid and the cash value of in-kind government payments received needed to calculate family disposable income. Additionally, the measurement of working poverty trends requires a comparison of the severity of poverty at similar points in the business cycle. The years 1991 and 2002 represent such points. According to estimates of the Congressional Budget Office, real gross domestic product (GDP) as a fraction of potential GDP was approximately 0.972 in 1991 and 2002. That is, the relative weakness in the economy (actual GDP less than potential) was virtually identical in each year.

As mentioned earlier, a working family is defined based on the combined hours worked of all family members in the previous year. Total hours are calculated as the number of weeks worked by each member times their usual weekly hours worked. Because the March CPS does not identify the actual hours a person worked during each week of the year, it is possible that the measure of total hours worked overstates actual hours. For example, someone might usually work 35 hours a week, but occasionally might work fewer hours. There is, however, no alternative and as long as measurement errors are similar from one year to the next the estimated trends should be little affected.

Finally, because the index values are estimated from samples they are subject to sampling error. In order to draw meaningful conclusions about the trends in working poverty, the statistical significance of the measured changes must be assessed. Apparent changes in each index might be statistically indistinguishable from no change.

To formally assess whether the measured changes in the indexes during the period are different from zero, we use a t-statistic for testing the difference between two sample means ([32], pp. 304-6). Reference to equation (1) indicates that H and P_2 are computed as sample average values. The t-statistic formula requires each index's sample variance, obtained using expressions developed in [28] specifically for the indexes used here.

ESTIMATED TRENDS IN WORKING POVERTY

Trends for Poor Families Working at Least 1,750 Total Hours

The results of the computations for all working families and for population subgroups are shown in Table 3. The table shows the change in index values between 1991 and 2002. Recall that 1991 and 2002 constitute similar points in the business cycle, allowing the differences in the index values to be interpreted as trend changes as opposed to cyclical fluctuations.

The second column of Table 3 reveals that the headcount poverty rate for working families fell between 1991 and 2002 by almost a full percentage point. Although the time profile is not shown, H rose in the early 1990s before trending downward until 2002. The corresponding value for P_2 (column 3) shows that the broader index behaved quite differently than H, registering an increase albeit a relatively small one. The index rose in the early 1990s and peaked when H did. However, it declined only until the mid-1990s, returning roughly to its starting value. P_2 then fluctuated for the rest of the period and by 2002 was slightly higher than in 1991. The unique time path of P_2 results from movements in the income gap and income inequality among the poor. Both experienced sizable increases that more than offset the large drop in the headcount rate noted above.

The t-statistics (displayed below the relevant index) indicate that the increase in P_2 between 1991 and 2002 is not statistically significant at the 5 percent level. The decrease in H, however, is significantly different from zero at high levels of confidence. The calculated t-statistics for the changes are 1.14 for P_2 and -12.8 for H. Thus, the alternative measure does lead to fundamentally different conclusions about trends in the extent of working poverty relative to H—no change versus a significant decrease.

Because policy makers and others are often interested in the circumstances facing particular population subgroups, the question naturally arises as to whether conclusions about working poverty among these groups are sensitive to the choice of the poverty index. To answer this question, estimates were generated for gender and racial/ethnic categories, for families with children, and for female-headed households. These categorical distinctions often are part of the general and policy discourses on poverty.

Clear differences between the indexes are evident. The headcount rates for each subgroup fell significantly during the period. By comparison, only the P_2 index for the black subgroup fell significantly, while the index for the white subgroup rose significantly. The remaining P_2 changes were not significantly different from zero.

Trends for Poor Families Working at Least 1,050 Total Hours

Table 4 contains the estimates for all working families and for population subgroups based on the less stringent criterion for total hours worked. The estimates are broadly consistent with those in Table 3.

Once again, H declined significantly for the overall population in working poor families and for the population subgroups studied. The declines are somewhat larger than those based on the 1,750-hours cutoff. By contrast, P_2 did not change significantly for

the overall population. Concerning population subgroups, the change for the white category is no longer significant as before, while the change for the Hispanic category becomes significant, as does the change for families with children.

In sum, reliance on *H* leads to an overly optimistic assessment of the past decade regarding working poverty. The overall *H* fell significantly, as did the *H* for all of the population subgroups studied. Reference to the broader and more theoretically appealing P_2 index offers a less sanguine and more varied view. The extent of poverty for the overall population of working families has failed to improve during the period despite the longest expansion in post-WWII history. As mentioned earlier, there are many good reasons for this outcome, given the complex economic and policy developments that occurred in the decade apart from the robust aggregate growth. The conclusion also holds for a majority of population subgroups examined. These findings arise for both of the cutoffs used to define "working." The one result common to *H* and P_2 is that working poverty for African Americans improved significantly, a clearly welcome development.

FACTORS AFFECTING CHANGES IN THE INDEXES

Both of the poverty indexes are functions of family disposable income. Consequently, changes in the indexes between 1991 and 2002 are caused by movements in disposable income that resulted from shifts in its three underlying components: changes in market incomes, changes in taxes, and changes in the amounts of cash and in-kind transfers. For example, changes in taxes will push a greater or smaller number of families above their poverty thresholds, leading to a different headcount rate. Tax changes can also affect the size of the average income gap and the distribution of income among the poor. These

shifts, together with any changes in the headcount rate, would alter the level of the P_2 index. This section decomposes the total changes in H and P_2 between 1991 and 2002 so as to identify the contribution of each income component.

The decompositions require the calculation of two additional sets of index values for H and P_2 based on alternative income definitions.[2] One set comprises index values calculated using income that includes market-based income and all transfers but does not subtract taxes. The difference between these values and the ones based on disposable income (i.e., those shown in Tables 3 and 4) yields the impact of taxes on each index in a given year. The second set of additional calculations comprises index values computed using income that neither subtracts taxes nor includes any transfers. That is, it uses only pre-policy market-based income. The difference between these values and those that include transfers but do not subtract taxes measures the impact of transfers on each index.[3]

In the discussion that follows, *Market* refers to pre-policy market income, that is, income where taxes have not been subtracted and transfers have not been added in. *Market+Tr* refers to the headcount rate calculated using income where taxes have not been subtracted but transfers have been added. *Market+Tr-T* is the study's baseline disposable income definition, where taxes are subtracted and transfers added.

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[2] Comparing index values using different income definitions is a standard approach for gauging the impact of policy on poverty ([7], [13], [14], [15], [25], [30], [39], [48], [49], [50]). The approach implicitly assumes that government policies do not affect individual behaviors. To the extent that transfers cause individuals to reduce the amount that they work and save (as a neoclassical economic model would predict), the calculations will overstate the impact of policy. Studies suggesting that the behavioral impacts of transfers are relatively small include [1], [9], [15], [30], and [35].

[3] The calculations could also be done using income that subtracts taxes but does not add in transfers. Then the impact of taxes would equal the difference between index values based on market income less taxes and those based on just market income. The effect of transfers would equal the difference in index values based on market income less taxes and those based on market income less taxes plus transfers. Doing the analysis this way leads to the same qualitative conclusions as the procedure described in the text. The actual magnitudes for the effects of taxes and transfers are larger for the headcount rate but virtually identical for the P_2 index. Note that the combined effect of taxes and transfers will be the same in either case.

The Effects of Market Income, Taxes and Transfers on H and P_2 in 1991 and 2002

Table 5 contains the results using the 1,750 hours cutoff. In 1991 the value for *Market* is 0.0679 and that for *Market+Tr* is 0.0424. The difference between the two, 0.0679 – 0.0424 = 0.0255, yields the net effect of transfers on the headcount rate. That is, cash and in-kind transfers reduced *H* by 2.55 percentage points in 1991. The net effect of taxes on *H* in 1991 is the difference between the value for *Market +Tr* and that for *Market+Tr-T*, or 0.04615 – 0.0424 = 0.0037. Taxes thus increased the working poverty headcount rate by 0.37 percentage points. Corresponding calculations can be made for the headcount rate in 2002 and for the P_2 index for both years (Table 5). These indicate that transfers decreased the headcount rate in 2002, and decreased P_2 in both years. Taxes decreased both the working poverty headcount rate and P_2 index in 2002, but increased the P_2 index in 1991.

The preceding methodology was re-applied using the index values based on the 1,050 hours cutoff. The results are displayed in Table 6. The contributions appear qualitatively similar to those found for the 1,750 hour cutoff, although the magnitudes are somewhat different.

The Effects of Market Income, Taxes and Transfers on Poverty Trends

Given the information in Table 5, the contribution of each income component to the trends in poverty, that is, the change in the indexes between 1991 and 2002, is simply the difference between its effect on the levels of *H* and P_2 in 1991 and in 2002. The decomposition for *H* is shown in the first row of Panel A in Table 7. The actual change in *H* from Table 5 (i.e., *H* based on *Market+Tr-T)* is 0.0364 - 0.0461 = -0.0097. The

change in *H* attributable to shifts in market income is the value of *Market* in 2002 less its value in 1991, 0.063 – 0.0679 = -0.0049.

Changing tax impacts led to a further reduction of -.0088. In 1991, taxes actually increased *H* by 0.0037 as noted earlier. However, tax changes during the period led taxes to reduce *H* in 2002 by -0.0051. The shift in the impact of taxes from increasing *H* by 0.0037 in 1991 to decreasing it by 0.0051 in 2002 is the –0.0088 displayed in the table.

One particular tax change that is directly relevant to the working poor is the expansion of the earned income tax credit (EITC) that occurred in the 1990s. The CPS data include separate information on the amount of the EITC received by a family; thus, it is possible to calculate the specific contribution of the change in EITC during the period to the change in *H*. This is done using the same methodology described above, by subtracting the *H* value for *Market* + *Tr* – *T* – *EITC* from that for *Market* + *Tr* – *T*. The result shows that the EITC changes caused a 0.0061 decline in *H*. This equals about 70 percent of the total change attributable to all tax changes (not shown in Table 7) and about 63 percent of the total decline in *H*. The effect clearly was substantial and beneficial.

Cash and in-kind transfers decreased the headcount rate both in 1991 and 2002. However, their beneficial effects on *H* decreased over time due to program cuts and other retrenchments in the safety net. The reduction in *H* due to transfers was -0.0255 in 1991 but only -0.0215 in 2002. The weakening impact of transfers thus contributed to a 0.004 increase in *H* (the difference between -0.0215 and - 0.0255) between 1991 and 2002.

As with the EITC, calculations were done to isolate the contributions of changes in two particular transfer programs, cash welfare (AFDC/TANF) and food stamps.

Combined changes in the amounts of these transfers produced an increase of 0.0015 in *H*, or 37.5%t of the changes due to all transfer changes (not shown in Table 7).

Overall, the decrease in *H* due to changes in market income (-0.0019) and tax policy (-0.0088) more than offset the increase from changes in transfers (0.004). As a result, *H* fell. The total decline of -0.0097 (the value of *Market+Tr-T* in 2002 less its value in 1991) equals the sum of the component changes.

The same methodology is applied to the data in Table 5 to obtain the decompositions for P_2. The second row of Panel A in Table 7 contains the results for the P_2 index, which rose by 0.0002 for the period as a whole (0.0066 – 0.0068). Changes in market income contributed -0.0005 to the total change. As reckoned above, changing market-based income contributed to a lower *H* over the period. By contrast it led to increases in the average income gap and inequality among the poor (these values are not shown). However, the magnitude of the impact of market income change on *H* was sufficiently large that its net effect was to decrease P_2.

Changes in the impact of taxes reduced P_2 by -0.0013. Tax policy reduced the income gap in both years, but the effect was smaller in 2002, causing a small increase in the gap between 1991 and 2002. Tax policy decreased inequality in 1991, but increased it in 2002, causing an increase in inequality for the period as a whole. The increases in the gap and inequality due to taxes coupled with the corresponding decreases in *H* contributed -0.0018 to the change in P_2. Here, as they did for *H*, changes in the EITC played a major role. Calculations reveal that EITC changes decreased P_2 by -0.001, or 77 percent of the total decline due to tax changes.

Changes in the impacts of transfers caused P_2 to rise by 0.004, more than offsetting the effects of market incomes and taxes. Transfers reduced the gap and inequality in both years, but the impacts decreased between 1991 and 2002. Consequently, the changes increased P_2 over the period. The relative contribution of changes in cash welfare and food stamps are larger for P_2 than for H. They are responsible for 55 percent of the increase in P_2 between 1991 and 2002.

In sum, the relatively small decrease in P_2 due to movements in market income, and the roughly offsetting changes due to shifts in taxes and transfers left P_2 slightly higher in 2002 than in 1991. To reiterate, though, the increase was not statistically significant.

The decompositions of changes in H and P_2 (1991 to 2002) for the sample including all individuals who worked at least 1,050 hours are displayed in the first and second rows of Panel B in Table 7, respectively. The patterns mirror those based on the higher cutoff for hours worked. That is, changes in market income and in taxes contributed to reductions in both H and P_2, while changes in transfers contributed to increases. The latter were more than offset by the former, producing numerical increases in both indexes. Some quantitative difference can be seen. For instance, changes in market income play a relatively larger role in the total index changes, exceeding the impact of tax changes for both indexes. As before, changes in the earned income tax credit are responsible for 70 percent to 75 percent of the total decline due to taxes.

CONCLUSION

Individuals classified as the working poor have held a privileged place in public discussions and policy debates. The fact that they are "playing by the rules" yet remain in poverty has led to increased scrutiny of their condition and heightened attention to policies aimed at improving their lot. This study measured how the substantial and numerous economic and policy changes of the 1990s affected the extent of working poverty. It did so using both the official poverty headcount rate and an alternative index that more fully captured the financial situation of working poor families. The study found that the choice of poverty index matters significantly. Based on the official measure, poverty declined significantly during the decade. By contrast, the alternative measure indicates that the degree of working poverty remained unchanged. This lack of progress occurred despite the longest aggregate economic expansion in the post-WWII period. Similar differences in the indexes were found for various population subgroups and for different definitions of working poverty.

The study also explored how changes in market-based income, taxes, and transfer payments have contributed to the measured trends. Changes in these components had similar qualitative impacts on both indexes. However, they affected the indexes by different relative magnitudes and so caused the poverty measures to have distinct trends. Shifts in market-based income led to less working poverty than otherwise, as did movements in taxes. Changes in transfers, by contrast contributed to higher poverty.

The analysis revealed that the expansion of the earned income tax credit that occurred in the 1990s was responsible for the large majority of the beneficial effects of tax changes. The impacts on P_2 were somewhat larger than those on the headcount rate.

Changes in cash welfare and food stamps contributed importantly to the deleterious effects of transfer changes on working poverty, with the impact on P_2 noticeably greater.

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Table 1: Macroeconomic Indicators[a]

Indicator	1991	2002
Real gross domestic product (Billions; chained 2000 dollars)	7,100.50	10,048.80
Civilian unemployment rate	6.8%	5.8%
Consumer price index (all items)	136.2	179.9
Real average hourly earnings (1982 dollars)	$7.58	$8.24
Federal budget surplus or deficit (-) (billions)	-$269.20	$-157.8
Real corporate profits (1982 dollars)	$331.28	$492.66
S&P 500	376.18	993.94

[a] Source: *2007 Economic Report of the President*, Washington D.C.: Government Printing Office.

Table 2: Poverty and Inequality Indicators

Indicator	1991	2002
Family poverty rate[a]	11.5%	9.6%
Real average family poverty gap per member (1982 dollars)[a]	$1,150.51	$1,290.16
Fraction of poor living below ½ the official poverty thresholds[a]	39.4%	40.7%
Household income Gini coefficient[a]	0.428	0.462
Individual earnings Gini coefficient[a]	0.355	0.409
Real hourly wage, less than high school degree (2005 dollars)[b]	$10.66	$10.66
Real hourly wage, high school degree (2005 dollars)[b]	$13.28	$14.35
Real hourly wage, college degree (2005 dollars)[b]	$21.13	$24.91

[a] Source: *Bureau of the Census, www.census.gov.*
[b] Source: *Economic Policy Institute*, www.epinet.org.

Table 3: Poverty Index Changes, 1991 to 2002[a]
(total family work hours at least 1,750)

Population Group	Headcount Rate	P_2
All Working Families	-0.0097**	0.0002
	(-12.82)	(1.14)
Gender		
Men	-0.0091**	0.0001
	(-8.74)	(0.28)
Women	-0.0103**	0.0004
	(-9.40)	(1.27)
Race/Ethnicity		
White	-0.0086**	0.0006*
	(-10.86)	(2.31)
Black	-0.0253**	-0.0018*
	(-8.09)	(-2.00)
Hispanic	-0.0492**	-0.0015
	(-15.43)	(-1.71)
Working Families with Children	-0.0149**	-0.0004
	(-14.51)	(-1.18)
Female-headed Families	-0.0283**	0.0005
	(-10.03)	(-0.47)

Source: Author's calculations.
[a]t-statistics are for the difference between sample means [Kinney (1996)] and are in parentheses. Formulas for the sample variances of the indexes are from Kakwani (1993). * and ** indicate statistical significance at the 5% and 1% levels, respectively.

Table 4: Poverty Index Changes, 1991 to 2002[a]
(total family work hours at least 1,050)

Population Group	Headcount Rate	P_2
All Working Families	-0.0142** (-17.43)	-0.0004 (-1.64)
Gender		
Men	-0.0133** (-11.86)	-0.0005 (-1.52)
Women	-0.0151** (-12.80)	-0.0004 (-1.12)
Race/Ethnicity		
White	-0.0124** (-14.62)	0.0001 (0.39)
Black	-0.0342** (-10.23)	-0.0036** (-3.90)
Hispanic	-0.0557** (-16.90)	-0.0033** (-3.59)
Working Families with Children	-0.0217** (-19.67)	-0.0014** (-4.48)
Female-headed Families	-0.0380** (-13.09)	-0.0019 (-1.79)

Source: Author's calculations.
[a]t-statistics are for the difference between sample means [Kinney (1996)] and are in parentheses. Formulas for the sample variances of the indexes are from Kakwani (1993). * and ** indicate statistical significance at the 5% and 1% levels, respectively.

Table 5: H and P_2 Values for Alternative Income Definitions[a]
(total family work hours at least 1,750)

Income Definition	1991 Value	2002 Value
H Values		
Market	0.0679	0.063
Market + Tr	0.0424	0.0415
Market + Tr - T	0.0461	0.0364
Impact of transfers on H[b]	-0.0255	-0.0215
Impact of taxes on H[c]	0.0037	-0.0051
P_2 Values		
Market	0.0134	0.0129
Market + Tr	0.0063	0.0078
Market + Tr - T	0.0066	0.0068
Impact of transfers on P_2[b]	-0.0071	-0.0051
Impact of taxes on P_2[c]	0.0003	-0.001

Source: Author's calculations.
[a] Market refers to pre-tax, pre-transfer income; Tr refers to cash plus in-kind transfers; T refers to taxes.
[b]Calculated as (Market + Tr) – Market.
[c]Calculated as (Market + Tr – T) – (Market + Tr)

Table 6: H and P_2 Values for Alternative Income Definitions[a]
(total family work hours at least 1,050)

Income Definition	1991 Value	2002 Value
H Values		
Market	0.0878	0.0776
Market + Tr	0.0543	0.0501
Market + Tr - T	0.0582	0.0440
Impact of transfers on H[b]	-0.0335	-0.0275
Impact of taxes on H[c]	0.0039	-0.0061
P_2 Values		
Market	0.0190	0.0163
Market + Tr	0.0082	0.0092
Market + Tr - T	0.0084	0.0080
Impact of transfers on P_2[b]	-0.0108	-0.0071
Impact of taxes on P_2[c]	0.0002	-0.0012

Source: Author's calculations.
[a] Market refers to pre-tax, pre-transfer income; Tr refers to cash plus in-kind transfers; T refers to taxes.
[b]Calculated as (Market + Tr) – Market.
[c]Calculated as (Market + Tr – T) – (Market + Tr).

Table 7: Decomposing the Changes in H and P_2, 1991 to 2002

Panel A: total family work hours at least 1,750

Poverty Index	Total change	Due to market	Due to taxes	Due to transfers
H	-0.0097	-0.0049	-0.0088	0.004
P_2	0.0002	-0.0005	-0.0013	0.002

Panel B: total family work hours at least 1,050

Poverty Index	Total change	Due to market	Due to taxes	Due to transfers
H	-0.0142	-0.0102	-0.010	0.006
P_2	-0.0004	-0.0027	-0.0014	0.0037

Source: Author's calculations using estimates from Tables 5 and 6.