EMPLOYMENT POLICIES INSTITUTE

The Economic Well-Being of Low-Income Working Families

Dr. John P. Formby, Dr. John A. Bishop and Dr. Hoseong Kim

University of Alabama, East Carolina University and University of Alabama

March 2002

A Study From The Employment Policies Institute

The Employment Policies Institute (EPI) is a non-profit research organization dedicated to studying public policy issues surrounding employment growth. In particular, EPI research focuses on issues that affect entry-level employment. Among other issues, EPI research has quantified the impact of new labor costs on job creation, explored the connection between entry-level employment and welfare reform, and analyzed the demographic distribution of mandated benefits. EPI sponsors non-partisan research that is conducted by independent economists at major universities around the country.

Dr. John Formby is the James Patrick and Elizabeth Brannan Hayes Distinguished Professor of Economics at the University of Alabama. His research interests include applied welfare economics, income distributions, redistributions and poverty, and labor market earnings inequality.

Dr. Formby's research has appeared in leading economic journals and books. He co-wrote The Economics of the Firm, and written chapters in over a dozen other books. Articles by Dr. Formby have also appeared in the *Journal of Labor Research, Applied Economics, Economica, and the American Economic Review.* He received his Ph.D. in Economics from the University of Colorado in 1965.

Dr. John Bishop is professor of economics at East Carolina University. His research interests include poverty and inequality, public finance and public choice.

Dr. Bishop co-authored The Political Economy of Income Distribution and Growth with Dr. Formby in 1992. Work from Dr. Bishop has also appeared in the *Southern Economic Journal, Applied Economics, Economica, and The American Economic Review.* He received his Ph.D. in Economics from the University of Alabama in 1987.

Dr. Hoseong Kim is a visiting assistant professor of economics at the University of Alabama, and has co-authored several research reports. He received his Ph.D. in Economics from the University of Alabama in 1994.

The Economic Well-Being of Low-Income Working Families

Executive Summary

In this study, the authors examine the changing structure of income for low-income families in the United States during the 1990s. In particular, they focus on the role of low-wage earnings, the Earned Income Tax Credit, and payroll taxes.

Increasing Income Mobility of Low-Income Families

One of the most striking findings of this study is the high rate of upward mobility of low-income families, particularly in the mid- and late-1990s. The authors conclude that 30 percent of all low-income families (i.e., those with incomes below twice the official poverty line) in 1997 were no longer in the low-income population one year later. This compares with figures of 23, 26 and 27 percent for the periods 1991-1992, 1993-1994 and 1996-1997, respectively. The figure is even more striking **for families in poverty in 1997: Of these, a full 47 percent had moved out of poverty in 1998. Comparable figures for the 1991-1992, 1993-1994 and 1996-1997 periods were 34, 42 and 46 percent, respectively.** Figures 1 and 2 show the upward trend of mobility out of the low-income and poverty populations during the 1990s. It is clear based on these mobility indicators, as well as those indicating upward movement within the low-income population, that the income mobility of low-income families increased significantly during that period.

Figure 1 Percentage of Families Leaving Poverty After One Year

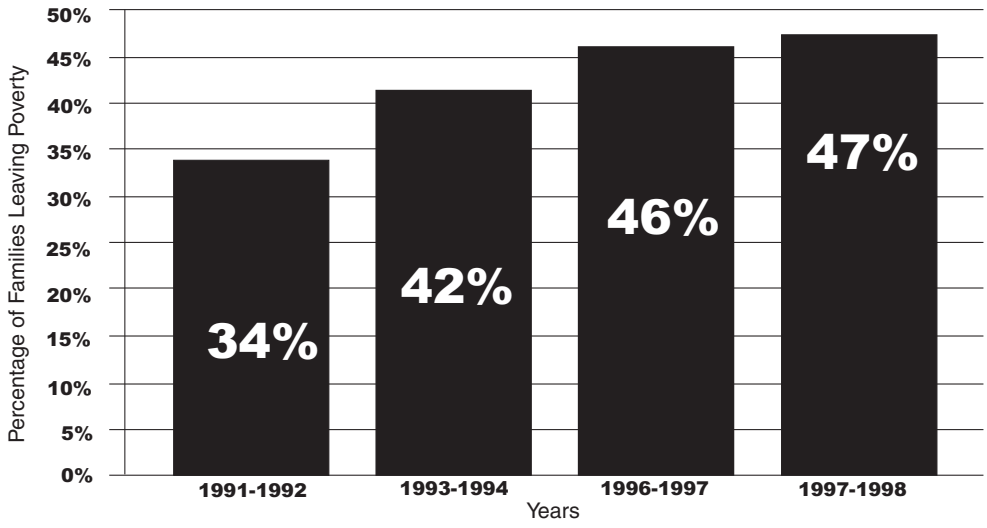
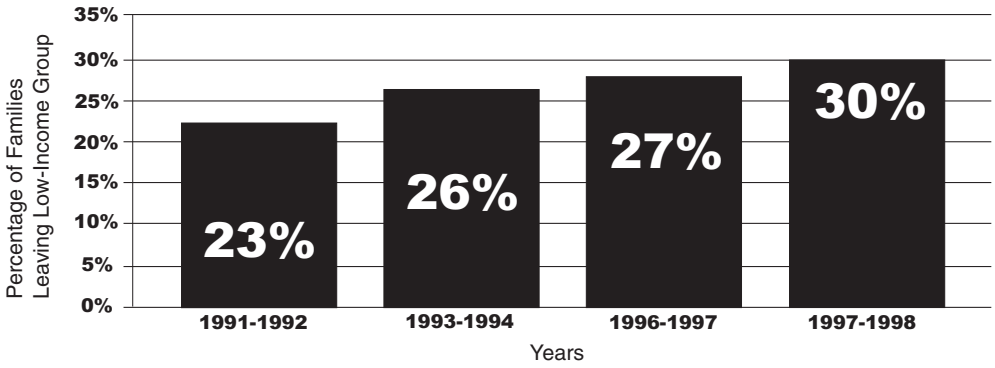


Figure 2 Percentage of Families Leaving Low-Income (i.e., Twice the Poverty level) Group after One Year



What Factors Affected Poverty During the 1990s?

The authors conclude that earnings from minimum wage work and the EITC both significantly reduced the number of working poor in the 1990s regardless of the location of the poverty line. However, the size of such impacts was sensitive to the income concept and equivalence scale used. Impacts were greater with the use of cash incomes and Orshansky scales, and smaller with the use of comprehensive income and NAS equivalence scales.

They conclude that welfare reform together with the long economic expansion may account for the increasing importance of minimum wage and other low-wage earnings during the 1990s. However, **they also conclude "for most low-income families, earnings that do not come from low-wage work continue to be a more important source of income than earnings from minimum wage work."**

Their analysis of the EITC reveals that increases in tax credits between 1993 and 1994 substantially increased the well-being of low-income families. For example, between 1990 and 1997, average adult equivalent EITC benefits more than doubled for families *below the poverty line*, and nearly quadrupled for those *below one-half of*, the official poverty line. However, their analysis of the combined effect of the EITC and payroll taxes revealed that families just above the official poverty line pay (in 1997), on average, as much in payroll taxes as they receive in EITC benefits.

The Effects of Welfare Reform on Poverty

The authors also examine the experience of families who left welfare from 1997 to 1998. On average, these families saw their earnings increase by 67 percent. Among the lowest 40 percent, the increases were even larger, by factors of 2 to 10. While earnings increased dramatically for those families leaving welfare, earnings also increased significantly for those families who remained on the welfare rolls. This is likely due to the strength of the U.S. economy. Those leaving welfare also saw their overall income rise; however, those who remained on welfare also saw their incomes rise thanks to their increased earnings while on welfare.

Measuring Poverty

At the foundation of the author's research is their treatment of the very important topic of poverty measurement. Measuring poverty is partly scientific and partly judgmental because it must reflect not only families' resources but

also their needs. While it is possible to measure resource availability objectively, measuring needs is far more subjective.

Social Security economist Molly Orshansky began to measure poverty in the 1960s. She defined households as poor if their money income before taxes fell below three times the Department of Agriculture's economy food budget. The official government poverty measurements follow the Orshansky approach of defining a threshold in terms of Census pre-tax money incomes and then inflating the thresholds for changes in purchasing power based on the Consumer Price Index (CPI).

Census money income was the only reliable measure of family-specific income that was available on an annual basis during the 1960s. While the money income-based definitions of poverty were reasonable, at least in the aggregate, for the 1960s, they are much less so today. This is because of the growth over time in housing subsidies, food stamps and other in-kind transfers, earned income tax credits and payroll taxes.

In 1995, a panel from the National Academy of Sciences (NAS) issued a report (*Measuring Poverty: A New Approach*) which recommended new ways of measuring poverty. The report recommended that family resources should be defined as the value of money from all sources, plus the value of near-money benefits (such as food stamps and subsidized housing) minus expenses that divert money from satisfying basic needs (such as taxes and child care expenses). It also recommended recalculating the poverty thresholds to incorporate dollar amounts for food, clothing, shelter and a small additional amount to account for other common, everyday needs.

To implement the NAS recommendations, analysts at the Census Bureau and at the Bureau of Labor Statistics worked together to derive new ways of measuring need by family size and geography, and devised other experimental poverty measures. Their research appears in the Census publication *Experimental Poverty Measures: 1990 to 1997*. **When the Census Bureau recomputed poverty for 1997 using the NAS recommendations, poverty rose from 13.3 percent to 15.4 percent.** Child poverty rose by only 0.4 percent from 19.9 percent to 20.3 percent; however, poverty among the elderly rose from 10.5 to 17.4 percent.

The authors respond to the debate over poverty measurement by focusing on three central issues. The first is to define and measure basic needs and set a needs threshold, below which a family is considered "poor" (e.g., an income of $17,463 a year). The second is to apply an equivalence scale to adjust the thresholds for differences in family size, composition and circumstance (e.g., a family with two adults and two children is "poor" at $17,463, but a single adult is "poor" at $8,794 a year). The final issue is what resources or "income" should be treated as available to the family (e.g., Should government benefits and taxes be considered?).

In this study, the authors measure changes in family economic status at a number of needs thresholds using different equivalence scales and different resource definitions. For example, they define the thresholds in intervals from 25 percent to 200 percent of the government's official poverty line. **In defining the thresholds, they use both the Orshanky and the NAS equivalence scales. Finally, they use a variety of resource definitions, including money income, comprehensive income (including most government benefits less taxes), and earnings only.** The comprehensive income measure adds to money income the market value of food stamps, subsidies for housing, energy and school lunches, the implicit return on home equity and earned income tax credits. It then subtracts federal and state income taxes, payroll taxes and property taxes.

Richard S. Toikka | *Chief Economist*

The Economic Well-Being of Low-Income Working Families

Dr. John P. Formby, Dr. John A. Bishop and Dr. Hoseong Kim

Table of Contents

I. Introduction

This research investigates the impact of labor market policies on the economic well-being of low-income families in the 1990s. Our focus is on the changing role of earnings by minimum wage workers, the Earned Income Tax Credit and payroll taxes in influencing the well-being of low-income Americans. The distinguishing feature of the research is the incorporation of insights from the poverty and income distribution literature into the analysis of the impact of the low-wage work, Earned Income Tax Credits, net labor income and payroll taxes on poverty and the well-being of low-income families.

Isabel Sawhill emphasized that measurement issues are central to all debates concerning U.S. poverty and accentuated the importance of reaching consensus, saying "… unless we can agree on a yardstick for measuring change, it will be impossible to say what has happened" (Sawhill 1988, p. 1074). For the most part the literature on the minimum wage and its impact on poverty has assumed that such a consensus exists and is embodied in the official poverty statistics.[1]

There are, of course, a number of measurement issues and difficulties.[2] We consider three major problems in this paper. Any research attempting to gauge the imp act of labor market polices such as minimum wages, payroll taxes and the EITC on the "poor" must answer these three questions. First, how do we draw the poverty line and which income sources are included? Second, given a poverty line for a representative family (e.g., a single mother with two children), how do we adjust this poverty line for differences in family composition? Finally, how do we measure poverty—a simple headcount or a more complex measure that incorporates differences in the intensity of poverty?

The sensitivity of the analysis to differences in the location of the poverty line and to differences in the intensity of poverty is addressed by the "dominance method" described below. We consider two definitions of income, the measure used in the official poverty statistics and comprehensive income, which includes the official cash income measure and adds the value of non-cash transfers, in-kind income and deducts direct taxes. For each income concept, we consider two adjustments for family size and composition (equivalence scales), the official Orshansky method and a new procedure recently proposed by the National Research Council in its in-depth study of poverty measurement, *Measuring Poverty: A New Approach* (Citro and Michael, 1995).

The data we analyze come from the *Annual Demographic File* of the Current Population Survey (March CPS). The March CPS is the largest income survey in the United States and has been used to make official estimates for four decades. The income concept used in this survey was adequate in the early 1960s, but is seriously deficient today. At the urging of Congress, the U.S. Census Bureau began systematically collecting and reporting the effects of noncash benefits for low-income Americans in 1980 and incorporating them into a free-standing supplement to the March CPS public use files. At approximately the same time, the Census Bureau also began estimating and reporting direct income, payroll and property taxes in a separate free-standing supplement. Since 1990, the Census Bureau has merged these estimates of noncash benefits, taxes and after-tax money incomes. This means that high quality data on family income, earnings, EITC payments, payroll taxes and income taxes are available in a single source. Our principal interest is in low-wage workers and low-income families, and for this reason, we focus primary attention on families with equivalent cash incomes of no more than twice the official poverty threshold. (The official poverty line was $8,350 for an adult equivalent in 1997.)

One additional piece of information about CPS microdata is important in understanding the research strategy underpinning this study. Each March CPS survey contains an overlap in the sample such that across any two years approximately one-half of the total households appear in successive surveys. We take advantage of this overlap to create a two-year "panel" that allows us to examine the impact of labor market policies on the same families across time. For example, the overlap sample permits us to focus on families leaving welfare for work. It also allows us to examine the changes in labor market outcomes before and after changes in the minimum wage, the EITC and welfare reform.

The report is organized as follows: Section II outlines the specific research questions that are addressed. Section III describes the methods used in the analysis and discusses several prominent issues in poverty measurement. Section III also summarizes our approach to resolving these issues. In particular, we provide an extensive description of the dominance and decomposition methods used in the empirical analysis. Section IV reports the empirical results, which are organized as answers to the questions appearing in Section II. The final section provides some concluding remarks and policy implications. Several appendices supplement the information provided in the body of the report. Appendix 1 summarizes details of how our data samples are drawn.

II. The Research Questions

The questions that guide the research are grouped into four broad categories, each of which contains a number of specific questions. The first set of questions relate to low-wage work and the contributions of earnings by low-wage workers to the well-being of families at or near the bottom of the income distribution. Descriptive data on wages, hours, earnings and contributions to the family are provided for minimum wage, near-minimum wage and sub-minimum wage workers. The second set of questions assesses the impact of earnings from low-wage work, the EITC and payroll taxes on family well-being using more rigorous methods. In contrast to the descriptive approach used to address the first set of questions, dominance methods are applied to gauge the impact effects of labor market policies on low-wage workers and their families. The third set of questions considers the impact of the EITC, payroll taxes and minimum wage earnings on income inequality among the low-income population. The final set of questions focuses on the dynamic changes in incomes and sources that are revealed by examining two-year panels of March CPS data for the same families.

II.1. The First Set of Research Questions

To provide an overview of low-wage work and its impact on low-income families we use descriptive data derived from the CPS to address the following specific questions:

1.a. How many minimum wage workers are there?

1.b. How many families at or near poverty include a (near-) minimum wage worker?

1.c. What fraction of income do minimum wage workers contribute to families at or near poverty?

1.d. Are workers in low-income families earning higher average wages over time, and are they working more or fewer hours across time?

1.e. Recognizing that the poor are not homogenous, which segments of the poor population are most directly affected by minimum wages?

II.2 The Second Set of Research Questions

To analytically assess the impact of low-wage work on low-income families across time we apply inference-based dominance procedures to address the following specific questions:

2.a. What is the impact of minimum wage workers' earnings on poor family budgets? Is the impact increasing or decreasing over time?

2.b. What impact do other low-wage earnings have on family budgets among the low-income population? Is the impact growing or declining over time?

2.c. What effect do state and federal income taxes have on the budgets of poor families? Is the income tax effect increasing or decreasing over time?

2.d. What impact does the EITC have on low-income family budgets? Is the effect of the EITC increasing or decreasing over time?

2.e. What effect do payroll taxes have on family budgets? Is the effect of payroll taxes increasing or decreasing over time?

2.f. What is the net (combined) impact of the EITC and payroll taxes? Is this net effect increasing or decreasing across time?

2.g. How sensitive are the answers to the above questions to changes in the definition of income and the choice of equivalence scale?

II.3 The Third Set of Research Questions

To determine the effect of low-wage labor market policies on inequality among low-income families we address the following specific questions:

3.a. Are the earnings of minimum wage employees reducing inequality among the poor?

3.b. Is the net EITC reducing inequality among the poor?

3.c. How sensitive are the answers to the above questions to changes in the definition of income and the choice of equivalence scale?

II.4 The Fourth Set of Research Questions

To investigate the changes in income sources and income dynamics (mobility) among low-income families across time we address the following specific questions:

4.a. How did the composition of income of *anonymous* families change after the 1991 minimum wage increase? After the 1993 EITC policy changes? After the 1996 minimum wage increase?

4.b. How did the composition of income of the *same* low-income families change after the 1991 minimum wage increase? After the 1993 EITC policy changes? After the 1996 minimum wage increase?

4.c. How did leaving welfare for work affect the well-being of the *same* families? How do these changes compare to the *same* families that did not leave welfare for work? How do these changes compare to the *same* families that left work for welfare?

4.d. How much income mobility is there among low-income American families in the 1990s and is the degree of mobility rising, falling or stable across time?

III. Poverty Measurement and Methodology

The accuracy of official United States Government poverty statistics is a hotly debated public policy issue. The methodology on which these figures are based is nearly forty years old. Increasingly, researchers and policymakers are debating the appropriateness of the official statistics. Much of this debate is captured in the 1995 report of the National Research Council's expert panel (Citro and Michael, 1998).

In this report we consider three major poverty measurement problems. These problems are discussed under three general headings: Poverty Thresholds and Equivalence Scales, Comprehensive Versus Census Money Income and Dominance Methods of Poverty Measurement. Additionally, we summarize our recently developed marginal decomposition methodology that is used to investigate dynamic changes in the income and sources of income for the *same* families over time.

III.1 Poverty Thresholds and Equivalence Scales

Deciding who is and who is not poor is critical. Unfortunately, from the perspective of unanimous or even broad agreement, any answer to this question inevitably involves arbitrary choices. There are two related issues that make it difficult to reach agreement concerning whether a person is poor. The first involves defining basic needs and establishing a minimum standard of living below which a person is poor. The second is the equivalence scale problem of how to account for differences in family size, composition and circumstance (e.g., age of family members). When one reads the early papers of Mollie Orshansky (1965a, 1965b) it is apparent that she was acutely aware of the inherent arbitrariness of any choice made concerning these issues.[3] Nevertheless, she thought it essential to adopt a framework on which there could be general, if not unanimous, agreement. This was correct in the 1960s and remains equally valid today.

Orshansky and her colleagues solved the related problems of basic needs and equivalence scales by constructing what have come to be referred to as Orshansky poverty thresholds. Across time these thresholds are inflated to adjust for changes in the purchasing power of nominal incomes. The procedure is arbitrary but any change in it is equally capricious. Orshansky (1965a) also proposed a second set of thresholds that were somewhat higher than those eventually adopted in the official poverty statistics. This can be interpreted as a first effort to judge the sensitivity of headcount measures to alternatives to the poverty thresholds used in the official poverty statistics. Today, researchers do this in a more formal way by making estimates using several sets of thresholds, some above and others below the official poverty line. Measuring poverty at alternative thresholds using alternative equivalence scales permits one to gauge the sensitivity of conclusions about poverty that accompany the arbitrary choices concerning basic needs and equivalence scales that are embodied in the official poverty statistics. We adopt this approach in evaluating the effects of minimum wage earnings, the EITC and payroll taxes on poverty and economic well-being among low-income families.

III.2 Comprehensive Versus Census Money Income

Orshansky and her colleagues used Census money incomes as the basis for determining family resources available for meeting basic needs and measuring poverty. The explanation for this choice is simple: Census money income was the only reliable measure of family specific income that was available on an annual basis in the 1960s. Had more comprehensive measures of income been available

they surely would have been used. Much has been made of the deficiencies of Census money income as the basis for measuring poverty, but in the 1960s it was a fairly good measure of family resources. When official measures of poverty first emerged, the major deficiencies of income as measured in the Annual Demographic File of the Current Population Survey were that it ignored income and payroll taxes and the implicit income flowing from the ownership of wealth in the form of home ownership. This almost certainly resulted in a bias that understated the number of poor young workers and their children and overstated the number of elderly poor. Overall and on balance, the poverty counts were unquestionably accurate. Indeed, given the measurement methodology, the Census Bureau expends considerable resources to insure the accuracy of the headcounts. However, across time the growth of housing subsidies, food stamps and other in-kind transfers, the emergence of earned income tax credits and the growth of payroll taxes have made the Census money income metric less valid as a measure of family resources. Only recently has a more reliable, annual measure of comprehensive income become available.

The differences between Census money income and the comprehensive income concept used in this paper are revealed by the following definitions. Census money income (also referred to as cash income) has been consistently defined for more than half a century as:

$$\text{Census Money Income} = \left[\begin{array}{c} \text{Wages and Salaries} \\ + \\ \text{Self Employment Income} \\ + \\ \text{Dividends, Rents and Interest} \\ + \\ \text{Cash Transfers} \\ + \\ \text{Other Cash Income} \end{array}\right]$$

Making use of recently expanded information in the March CPS files, a more comprehensive income can now be computed for each family. The measure we use can be seen in Formula 1.

Formula 1

$$\text{Comprehensive Income} = \text{Census Money Income} + \left[\begin{array}{c} \text{Market Value of Foodstamps} \\ + \\ \text{Market Value of Housing Subsidies} \\ + \\ \text{Market Value of Energy Subsidies} \\ + \\ \text{Market Value of School Lunch Subsidies} \\ + \\ \text{Implicit Return on Home Equity} \\ + \\ \text{Earned Income Tax Credit} \end{array}\right] - \left[\begin{array}{c} \text{Federal Income Taxes} \\ + \\ \text{State Income Taxes} \\ + \\ \text{Payroll Taxes} \\ + \\ \text{Property Tax} \end{array}\right]$$

Beginning with the March 1991 CPS (containing 1990 income data) the relevant information for constructing comprehensive income is part of the public use CPS file.

III.3. Dominance Methods of Poverty Measurement

Researchers have recently recognized that stochastic dominance analysis provides a powerful method for constructing ordinal poverty rankings and evaluating the well-being of low-income families. The attractive feature of the dominance approach is that it generates poverty

orderings that are robust with respect to the location of the poverty line and the choice of poverty measure (Foster and Shorrocks, 1988). In contrast, alternative methods for making poverty comparisons explicitly or implicitly involve the selection of a specific poverty line and poverty index, both of which are inherently arbitrary. For example, the official United States poverty measurement methodology arbitrarily yields a unique headcount of persons that are said to be poor, without consideration of the absolute or relative deprivation of the poor. The headcount ratio (poor persons as a percent of the population) is then taken as the aggregate measure of poverty.

To avoid these problems the dominance method proceeds by ordinally ranking the distributions of interest using a series of steps or stages that are referred to as first, second and third order dominance. If ordinal rankings are possible any two researchers or policymakers will be in general agreement concerning which of the observed distributions is best. An important characteristic of the dominance method is that additional distributions can be ranked by making more restrictive assumptions about welfare and economic well-being and proceeding to higher orders of dominance. Thus, second-order dominance adds marginally to the distributions that can be ranked using first-order dominance. Similarly, third-order dominance adds marginally to the ranking power of second-order dominance. Applied studies of income distributions and poverty focus almost exclusively on first- and second-order dominance, and we briefly discuss these methods in the context of low-income families and poverty.[4]

First-Order Dominance

Consider the general class of Foster-Greer-Thorbecke (Foster, Greer and Thorbecke 1984) poverty measures, $P_\alpha(z)$, defined by

$$(1)\ P_\alpha(z) = \int_0^z [1-(x / z)]^\alpha f(x)\, dx,$$

where z denotes the poverty line, x is household income, and $f(x)$ is the probability of observing a household with income x, and α is a parameter. When $\alpha = 0$, expression (1) reduces to the familiar headcount poverty measure, $P_0(z) = H(z)$. When $\alpha = 1$, expression (1) becomes the poverty gap ratio, $P_1(z) = S(z)$, which measures the intensity or depth of poverty as the average income shortfall of poor families relative to a fixed poverty line.

Each household income, x, is the realization from a random variable X. Let $F(x) = \Pr(X \leq x)$ be a cumulative distribution function (CDF) for this random variable. In similar fashion, define another distribution function $G(x) = \Pr(X \leq x)$. The following correspondence has been demonstrated by Foster and Shorrocks (1988).

THEOREM 1: $H_F(z) \leq H_G(z)$ for all z if and only if $F(x) \geq G(x)$ for all x (with at least one strict inequality).

In the stochastic dominance literature, the finding that $F(x) \leq G(x)$ for all x (with at least one strict inequality) is known as "first-order dominance" (FOD). Hence, Theorem 1 implies that if F first-order dominates G, then headcount poverty in F cannot exceed that of G, *regardless of the poverty line chosen*. Therefore, truncating the income distribution at some maximum poverty line, z_{max}, and testing for FOD on the truncated distribution provides a general headcount poverty ordering over a wide range of alternative poverty lines. Conversely, the theorem also implies that a decline in headcount poverty at all poverty lines is sufficient for FOD.

We illustrate the relationship FOD and headcount poverty in Figure 1 using EITC transfers, which is one of several policies that influence the well-being of low-income American families. The question we address in this paper is "How does the EITC change the income distribution among the low-income population, after accounting for other earnings and transfers?"

We address this question using the dominance methods summarized below.

The data used to construct Figure 1 are drawn from the 1998 Current Population Survey (CPS) Microdata Files, and are explained in detail below. We use the data here merely to illustrate the dominance approach. The sample is restricted to the low-income population, which for purposes of this paper is taken to be families with equivalent Census money incomes at or below 200 percent of the official poverty line. Figure 1 depicts two distribution functions, the before-EITC and after-EITC curves, which show equivalent cash incomes for the low-income population before and after EITC transfers. The initial objective is to evaluate the impact of EITC transfers on poverty at alternative cutoffs for the poverty line. Figure 1 identifies seven income cutoffs, which are expressed as proportions of the official poverty line, *z*. The proportions, k, range from 0.50 to 2.00. On the abscissa is given equivalent income based on official cash definition of income and the Orshansky adjustment for family size and composition (normalized to a single person equals 1).[5]

To further interpret Figure 1, consider any before-EITC income and its corresponding poverty cutoff. For example, let before-EITC income be chosen such that k = 0.50, which means we are at one-half the official poverty line. The addition of EITC transfers to cash incomes raises the incomes of the recipients, so we expect the after-EITC curve to lie above the before-EITC curve. The deviations between the before- and after-EITC poverty incidence curves in Figure 1 can be given two interpretations. First, the *vertical* deviations of the after-EITC curve from the before-EITC curve, represent the value of the EITC at each poverty cutoff. Second, the *vertical* deviations between the before- and after-EITC curves measure how far the EITC transfers move poor families up the poverty scale. If the after-EITC curve lies everywhere above to the left of the before-EITC (cash) curve as in Figure 1, then FOD prevails and there is an unambiguous reduction in headcount poverty, which illustrates Foster and Shorrocks' Theorem 1 (1998).

Figure 1 suggests that the impact of the EITC in reducing headcount poverty can be assessed by comparing the distribution of EITC transfers (ordered by before-EITC income) in the two years. If EITC transfers are larger at each poverty line within this range, then we can conclude that the EITC unambiguously has greater impacts in reducing headcount poverty in one year than another. We refer to this outcome as *first-order marginal poverty dominance,* which means we are considering the differences between two vectors of incomes that differ only in terms of EITC transfers. Thus, we are evaluating the effectiveness of the EITC in reducing poverty, given the effects of all other income sources on the income distribution, including taxes, cash transfers and other in-kind transfers. Of course, we may find that headcount poverty is lower at some poverty lines in year 1, but higher at other poverty lines in year 1. In this case, the outcome is ambiguous and FOD is unable to rank the relative effectiveness of the EITC in reducing poverty in the two years.

Figure 2 illustrates first-order marginal dominance using the EITC transfers from 1990 and 1997. As the 1997 EITC payments are always larger than the 1991 payments, we conclude that 1997 dominates 1991 at the first order. As noted above, first-order dominance in this case means the 1997 EITC was more effective at reducing headcount poverty regardless of the poverty line chosen. Dominance is illustrated graphically with the 1997 curve lying everywhere above the 1991 curve. Of course, it is possible that the two curves cross, in which case no unambiguous conclusion regarding the relative impact of the EITC on headcount poverty in the two years is possible.

Second-Order Dominance

If two distributions cannot be ranked by FOD, it may be possible to order them by second-order dominance (SOD). As Foster and Shorrocks (1988) have shown, there is a correspondence between the orderings obtained from SOD and the poverty gap ratio $S(z) = P_1(z)$.

Let $F_1(x) = \int_0^z F(t)\ dt$, and $G_1(x) = \int_0^z G(t)\ dt$. Then, the second Foster-Shorrocks theorem can be written as:

THEOREM 2: $S_F(z) \leq S_G(z)$ for all z if and only if $F_1(x) \geq G_1(x)$ for all x (with at least one strict inequality).

Theorem 2 implies that if F second-order dominates G, then the poverty gap in F cannot exceed that of G, *regardless of the poverty line chosen*. Thus, truncating the income distribution at some maximum poverty line, z_{max}, and testing for SOD on the truncated distribution provides a general poverty gap ordering over a wide range of alternative poverty lines. Conversely, an unambiguous decline in the poverty gap index is sufficient for SOD. Finally, as Foster and Shorrocks (1988) point out, FOD implies SOD.

Figure 3 illustrates the relationship between EITC transfers and SOD. As noted above, SOD integrates the CDF, and this is represented in Figure 3 by plotting *cumulative* equivalent income on the vertical horizontal axis. As in Figure 1, the horizontal axis provides alternative poverty lines. The vertical deviations between the before-EITC and after-EITC poverty curves in Figure 3 can be interpreted as the *cumulative* value of EITC transfers. Since the after-EITC curve in Figure 3 lies everywhere above the before-EITC curve, SOD prevails. By Theorem 2 of Foster and Shorrocks (1998), this implies an unambiguous reduction in the poverty gap index.

Figure 3 suggests that the way to compare the relative effectiveness of the EITC in reducing the poverty gap index over time is to compare the cumulative EITC transfers (ordered by before-EITC income) in the two years. If the cumulative EITC transfers are larger at each poverty line within the preselected range of poverty lines, then we can conclude that the EITC was more effective in reducing the poverty gap index in one year than another. We refer to this outcome as *second-order marginal poverty dominance*, and note that SOD implies dominance at all higher orders of dominance. As with headcount poverty and FOD, the poverty gap can be lower at some poverty lines in one year, but higher at other poverty lines in another year. In this case, the outcome is ambiguous and SOD is unable to rank the relative effectiveness of the EITC in reducing poverty gaps in the two years. However, an unambiguous ranking may be possible at a higher order of dominance.

Figure 4 illustrates second-order marginal dominance. As expected (given FOD in Figure 2), cumulative EITC transfers in 1997 are larger at every poverty line, implying that 1997 second-order dominates 1991. Of course, it is possible to have no ranking at the first-order and dominance at the second-order, but not the converse.

In summary, the dominance method avoids three difficulties researchers encounter using poverty indices. First, the dominance method is easily adapted to making poverty comparisons at alternative poverty lines. Second, the dominance method avoids the problem of choosing among a multiplicity of competing indexes. (See Bishop, Formby and Thistle, 1992 and Bishop and Formby, 1994 for detailed discussions of the dominance method.) Finally, by applying the related concepts of first-order, second-order and Lorenz dominance (Atkinson, 1970) researchers can address virtually all aspects of poverty while avoiding the troublesome possibility of interactions between poverty axioms that are inherent in the index number approach.

III.4. Marginal Decompositions and Changes in Income Sources of the Same Families

In this section we demonstrate that differences in the overall quantile function and the associated concentration function in the next period can be additively decomposed to show the year-to-year marginal impacts of income by source and by population subgroups (See Bishop, Chow, Formby and Zheng, 1997.) We are interested in examining the impact of three policy changes, the change in minimum wage earnings between 1990 and 1991, the expansion of the EITC between 1993 and 1994 and the 1996 welfare reforms.

We begin by formally defining quantile functions and associated income concentration functions and showing that differences between them measure marginal changes in the income distribution. We then present the marginal decompositions. Let $x \in [a,b]$ and $y \in [a,b]$ be continuous income variables, where x and y are jointly distributed with a probability density denoted by $f(x,y)$. For illustrative convenience, x is income in 1993 and y is income in 1994 (before and after the changes in the EITC). We also divide the income range $[a,b]$ into M+1 intervals: $[a,\tau_1],[\tau_1,\tau_2]$, ..., $[\tau_m,b]$. If the population distributions of x and y are continuous, then the *ordered quantile function* of x and the *income concentration function* of y over income interval $[\tau_i,\tau_j]$ are defined as:

(1) $\theta(\tau_i,\tau_j) = \mathrm{E}[xI(\tau_i \le x < \tau_j)]/Q(\tau_i,\tau_j)$, and

(2) $\vartheta(\tau_i,\tau_j) = \mathrm{E}[yI(\tau_i \le x < \tau_j)]/Q(\tau_i,\tau_j)$, where $\tau_i < \tau_j$, $i, j = 0,1,...,M+1$ and $\tau_0 = a$, $\tau_{m+1} = b$, E is the expectation operator and

(3) $I(\tau_i \le x < \tau_j)$ $\begin{cases} 1 \text{ if } \tau_i \le x < \tau_j \\ 0 \text{ otherwise} \end{cases}$

is an indicator variable. $Q(\tau_i,\tau_j) = \mathrm{E}[I(\tau_i \le x < \tau_j)]$ is the proportion of people whose 1993 incomes are between τ_i and τ_j.

The difference between $\vartheta(\tau_i,\tau_j)$ and $\theta(\tau_i,\tau_j)$ reflects the mean income change of families whose incomes in 1993 lie within $[\tau_i,\tau_j]$ and we refer to this difference as the *marginal impact effect* and denote it by τ_i and τ_j, i.e.,

(4) $R(\tau_i,\tau_j) = \vartheta(\tau_i,\tau_j) - \theta(\tau_i,\tau_j)$.

Obviously, $R(a,b)$ measures the mean income change of the whole population and $R(a,\tau_i)$ is the change in the conditional mean income of those families whose 1993 income falls below τ_i. This concept is illustrated in the previous section's Figure 1.

Marginal changes in the income distributions and marginal decompositions across time can now be identified. The array of $R(a,\tau_1)$, $R(\tau_1,\tau_2)$, ..., $R(\tau_m,b)$ and $R(a,b)$ given by (4) is referred to as the *marginal change in the entire distribution*. When weighted by family share of each income interval, $\theta(\tau_i,\tau_j)$, marginal changes $R(\tau_i,\tau_{i+1})$ to the mean income change of the entire population $R(a,b)$. The total change given by (4) can be further decomposed by income source and population subgroups.

To marginally decompose changes in the income distribution by source we assume that total income x and y are drawn from K sources such as wages and salaries, property income and capital gains and we denote these sources as $x^{(1)}, x^{(2)}, ..., x^{(K)}$ and $y^{(1)}, y^{(2)}, ..., y^{(K)}$. The *concentration functions of income sources* $x^{(k)}$ and $y^{(k)}$ for $k = 1, 2, ..., K$ are given by

(5) $\theta^{(k)}(\tau_i,\tau_j) = \mathrm{E}[x^{(k)}I(\tau_i \le x < \tau_j)]/Q(\tau_i,\tau_j)$

and

(6) $\vartheta^{(k)}(\tau_i,\tau_j) = \mathrm{E}[y^{(k)}I(\tau_i \le x < \tau_j)]/Q(\tau_i,\tau_j)$

The difference between the kth source income in 1993 and post-1994 is referred to as the *source marginal impact effect*, and is given by:

(7) $R^{(k)}(\tau_i,\tau_j) = \vartheta^{(k)}(\tau_i,\tau_j) - \theta^{(k)}(\tau_i,\tau_j)$.

The overall marginal effect is the sum of the source marginal effects, i.e.,

(8) $R(\tau_i,\tau_j) = \sum_{k=1}^{K} R^{(k)}(\tau_i,\tau_j)$.

We now turn to the marginal decomposition for population subgroups. Without loss of generality, let the income recipients of the society, denoted as θ, be classified into G mutually exclusive and exhaustive subgroups Φ_g, g=1,2,...,G. The *subgroup quantile* and *subgroup income concentration functions* are given by:

$$(9)\ \theta_g(\tau_i,\tau_j) = \mathrm{E}[xI(\tau_i \le x < \tau_j) \cdot I(x \in \Phi_g)]/Q_g(\tau_i,\tau_j)$$

and

$$(10)\ \vartheta_g(\tau_i,\tau_j) = \mathrm{E}[yI(\tau_i \le x < \tau_j) \cdot I(x \in \Phi_g)]/Q_g(\tau_i,\tau_j)$$

g = 1,2,...G, where

$$(11)\ Q_g(\tau_i,\tau_j) = \mathrm{E}[I(\tau_i \le x < \tau_j) \cdot I(x \in \Phi_g)],$$

is the population share of those families in the gth subgroup and whose 1993 incomes are between τ_i and τ_j. The gth subgroup's average gain or loss, which is referred to as the *subgroup marginal impact effect*, is similarly defined as

$$(12)\ R_g(\tau_i,\tau_j) = \vartheta_g(\tau_i,\tau_j) - \theta_g(\tau_i,\tau_j).$$

The overall marginal effect is the weighted average of the subgroup marginal effects, i.e.,

$$(13)\ R(\tau_i,\tau_j) = \sum_{g=1}^{G} p_g(\tau_i,\tau_j)\, R_g(\tau_i,\tau_j)$$

where $p_g(\tau_i,\tau_j) = Q_g(\tau_i,\tau_j)/Q(\tau_i,\tau_j)$ is the share of the gth group people in income class (τ_i,τ_j).

Equation (13) reveals that the overall marginal change is decomposable and the marginal contribution of each subgroup is recorded by the subgroup's population share. This property along with equation (8) allows us to decompose the overall change in the income distribution and to identify the subgroups and income sources that changed over time.

IV. Empircal Findings

We present the empirical findings in four parts corresponding to the research questions outlined in Section II. There are four broad categories or sets of questions, and the methods used to analyze the data and report the results differ depending upon which set of questions is being addressed. For example, we first provide an overview of the impact of low-wage work on family budgets and use descriptive methods to report the results. This is followed by dominance analysis using the methods described above to examine the effects of earnings from low-wage work, income taxes, the EITC and payroll taxes on poverty during the 1990s. We place special emphasis on the sensitivity of the results to key assumptions and choices made in measuring poverty. Next, we examine the impact of low-wage work, income taxes, the EITC and payroll taxes on inequality among the poor using methods that are applied in assessing the effects of taxes on income inequality. Finally, we report results on changes for both anonymous families and families that have been tracked over two-year intervals. This aspect of the research makes use of quantile functions, income concentration curves and the associated decompositions described in Section III.4 above.

The analysis of the same families from one year to the next reveals significant churning in the bottom tail of the income distribution, leading us to investigate and report on income mobility of American families in the 1990s. The method used to measure and evaluate income mobility involves constructing and describing mobility (transition) matrices, which track the dynamic income changes and movements of American families over two-year periods in the 1990s.

We point out that since the methods used in addressing the four sets of research questions differ, the tables reporting the results are organized and interpreted somewhat differ-

ently. For convenience and ease of reference, all tables relating to the first set of questions are numbered 1.1, 1.2, 1.3, …, 1.6 and those relating to the second set of questions are denoted 2.1, 2.2, 2.3, etc. Tables relating to the third and fourth sets of questions are numbered similarly.

IV.1. The First Set of Research Questions

To provide an overview of low-wage work and its impact on low-income families we divide workers into four groups, *minimum wage workers, near-minimum wage workers, sub-minimum wage workers* and *other workers*. In this study *minimum wage workers* include all persons above the age of 16 with positive earnings and an hourly wage reported and calculated to be between 90 and 110 percent of the federal minimum wage. *Near-minimum wage workers* include those above the age of 16 with hourly wages reported and calculated to be between 110 and 125 percent of the federal minimum wage. *Sub-minimum wage workers* include those above the age of 16 with hourly wages reported and calculated to be below 90 percent of the federal minimum wage.[6] Workers with hourly wages reported and calculated to be above 125 percent of the federal minimum wage are referred to as *other workers.*[7]

We also vary the poverty line and focus on four alternative counts of poor families. First, we let the poverty line be equal to the low-income cutoff (twice the official poverty line). Next, we set the poverty line at 75 percent of the low-income cutoff. We also consider the official definition of poverty, which corresponds to 50 percent of the low-income cutoff. Finally, we use a poverty line equal to 25 percent of the low-income cutoff, which is equivalent to 50 percent of the official poverty line.

Tables 1.1 and 1.2 show the number and characteristics of low-wage workers in 1999. The CPS data show that there were more than 21 million low-wage workers in 1999. Low-wage workers make up almost 16 percent of the workforce and CPS data disclose that among these, 32 percent are minimum wage workers, 33 percent are near-minimum wage workers and the remainder (35 percent) are sub-minimum wage workers. Selected characteristics of low-wage workers in 1998 are shown in Table 1.2. For the most part, Tables 1.1 and 1.2 yield insights into low-wage workers that are consistent with prior expectations. For example, among subgroups of workers, Table 1.2 reveals that 54 percent of all teenagers, 20 percent of females, 25 percent of Hispanics and 38 percent of those with less than a high school education are low-wage workers. However, there are two surprises. First, as a proportion of the subgroup population, the difference between white and non-white workers is less than we expected. Table 1.2 shows that among all white workers 15 percent are low-wage, while 19 percent of non-white workers are in this category. Second, the number and proportion of sub-minimum wage workers is larger than our prior expectations.[8]

Table 1.3 shows the number and proportion of low-income families that include at least one low-wage worker. At the official poverty line (50 percent of the low-income cutoff) 8.5 percent of all families have at least one minimum wage worker. Stated differently, more than 90 percent of poor families below the official poverty line do not have a minimum wage worker in the family. Table 1.3 (column 2) reveals that irrespective of where one draws the poverty line, 91 to 93 percent of poor families do not contain a minimum wage worker. For all low-wage workers (column 4), the comparable range is 74 to 78 percent. The implications of this are clear—for most, but not all poor families, there is little relationship between poverty and low-wage work.

The absence of a strong and systematic relationship between poverty and low-wage work suggests that the earnings of low-wage workers

are not likely to be an important source of income for poor families. Table 1.4 reveals that, depending upon the poverty line and income concept used, the earnings of minimum wage workers contribute between 4.7 and 8.2 percent of family income. For all low-wage workers the earnings contribution is between 14.5 and 28.1 percent. For comprehensive income (Table 1.4.b), which we believe to be the superior indicator of well-being, the earnings contribution falls between 4.4 and 6.1 percent for minimum wage workers and 13.4 and 19.0 for all low-wage workers. The results in Table 1.4 should not be misinterpreted. Low-wage work is not currently an important income source for the poor, but clearly more jobs for the able-bodied poor can contribute to the well-being of poor families.

Table 1.5 addresses questions relating to changes in average wages, hours and earnings of low-wage workers in low-income families across time. Table 1.5.a shows real wage rates for four years expressed in 1997 dollars. Columns 1, 2 and 3 of Table 1.5.a show that from 1991 to 1996 real hourly wages of sub-minimum, minimum and near-minimum wage workers all declined in real terms. The minimum wage changes in 1996 resulted in increases in real wages for minimum, sub-minimum and near-minimum wage workers alike. It is of interest to point out that the changes in the minimum wage in October 1996 appear to have had significant impact upon the wages of both sub- and near-minimum wage workers. The real wages of near-minimum wage workers rose by almost the exact same percentage as minimum wage workers, while the average wage rate of sub-minimum wage workers rose by a slightly smaller percentage. Thus, Table 1.5.a suggests that when the minimum wage law is changed, as it was between 1996 and 1998, there are both ripple down and ripple up effects in the labor market.

Another interesting result in Table 1.5.a is revealed by comparing the real wages in 1991 and 1996 in columns 1, 2 and 3 to those for all low-wage workers in column 4. While real wages declined within the sub-minimum, minimum and near-minimum wage groups (columns 1, 2 and 3), they rose, remained unchanged or declined only slightly when all of these groups are combined in column 4. The explanation of this seeming anomaly is that more low-wage workers were in the minimum and near-minimum wage groups in 1996 than in 1991. Thus, the distribution of low-wage workers changed across time.

Table 1.5.b shows average weekly hours (hours worked last week) for low-wage workers across time. Within the three categories of low-wage workers, descriptive data suggest that there has been little systematic change in usual hours worked last week as reported in the March CPS during the 1990s. However, two things in Table 1.5.b do stand out. First, on average, sub-minimum wage workers work slightly more hours than do minimum and near-minimum wage workers. This is typically the case both across time and at alternative poverty lines. Second, when the poverty line is drawn at 25 percent of the low-income cutoff (equivalently, 50 percent of the official poverty line), low-wage workers work fewer hours than the low-wage workers identified when the poverty line is set at higher points in the family income distribution. Thus, among the poorest families at the absolute bottom of the distribution, the small numbers of persons who work tend to work fewer hours than low-wage workers in other low-income families.

The real earnings of low-wage workers for 1990, 1995, 1997 and 1998 are shown in Table 1.5.c. We point out that annual CPS earnings data are for the calendar years preceding the March CPS and are, therefore, neither the product of the wage and hour data in Tables 1.5.a and 1.5.b nor are they necessarily consistent with conjectures one might make from these wage and hour data. In particular, weeks worked the preceding year significantly influence annual earnings. Further, usual weekly hours worked last year may diverge

from hours worked in the week preceding the March CPS survey. For example, Table 1.5.a indicates that the real wage of minimum wage workers declined between 1991 and 1996, Table 1.5.b suggests that their usual hours worked changed little,[9] and Table 1.5.c indicates that their real earnings increased between 1990 and 1995. A possible explanation for this seeming contradiction is that average hours worked per year must have increased across time. Analysis of weeks worked and hours usually worked per week last year suggest an explanation of the seeming contradiction. On average, workers increased the number of hours worked per year across time. Increases in annual hours worked were especially large for female workers at the bottom and top of the earnings distribution.

We now consider the question of which segments of the poor population are most directly affected by minimum wages. As discussed above, there appear to be both ripple up and ripple down effects of changes in the minimum wage law. For this reason we continue to focus on all low-wage workers and provide descriptive results for minimum, sub-minimum and near-minimum wage workers for 1990, 1995, 1997 and 1998. Table 1.6 provides summary information. Table 1.6.a shows contributions of low-wage earnings to family income across time when the poverty line is drawn at 100 percent, 75 percent, 50 percent and 25 percent of the low-income cutoff. For ease of interpretation, this Table repeats the information in Table 1.4 for 1998 and adds comparable information for 1997, 1995 and 1990.[10] As noted above, the earnings contributions of low-wage workers to the family incomes of the poor were small in 1998. Table 1.6.a shows that the contributions were even smaller in 1990 and 1995. A notable change occurred between 1995 and 1997. However, there is little apparent difference between 1990 and 1995, and 1997 and 1998. The change between 1995 and 1997 is clear when viewed from the perspective of either cash income (Table 1.6.a) or comprehensive income (Table 1.6.b).

Table 1.7 breaks out the contributions of low-wage earnings to the incomes of poor white, non-white, female headed and Hispanic families. The very sharp increase in the importance of low-wage worker's earnings between 1995 and 1997 holds for all family types. Thus, it appears that welfare reform and the continuing expansion of the American economy played an important role in making low-wage work more important to the well-being of poor families of all types in the late 1990s. A final point relating to Table 1.7 warrants emphasis—low-wage earnings are a much more important source of income for Hispanic families than other types of poor families. This is the case whether one looks at the cash incomes in Table 1.7.a or the comprehensive incomes in Table 1.7.b.

IV.2. The Second Set of Research Questions

To evaluate and test explicit hypotheses concerning the impact of low-wage work and labor market policies on the well-being of the poor we go beyond descriptive data and apply inference-based dominance techniques. The objective is to quantify the effects of total family earnings, earnings of minimum wage workers and earnings of other low-wage workers on poor families' budgets in the 1990s and determine whether they have been effective in enhancing well-being among the poor. We first report on the impact of earnings, the Earned Income Tax Credit, payroll taxes and income taxes on the poor using the official (cash) income concept. To adjust for family size and composition we use Orshansky equivalence scales. The method used in this Section is first-order marginal dominance as described above.

Table 2.1 shows the impact of family earnings on the economic well-being of the poor. In this table we divide low-income families into seven income classes where the classes

are identified by using fractions of the official poverty line. In 1997 the official poverty line for a nonelderly single person was $8,350. Adjustments for the age of the head, the number of persons in the family and the number of children under 18 are made according to the official Orshansky equivalence scales. Appendix 2 provides the Orshansky equivalent incomes normalized to a single adult that were used to estimate adult equivalent incomes, earnings, taxes and transfers. The income concept used is the official cash income definition. All incomes are reported in adult equivalent 1997 dollars using the Consumer Price Index (CPI) to adjust nominal incomes.

Column 1 of Table 2.1 identifies the income classes. For example, the 1st class has the lowest income and is denoted as "Below 50%," referring to the official poverty line. This class contains all families with adult equivalent incomes less than $4,175 in 1997 dollars, which is one half of the official poverty line. Likewise, the 3rd class, with incomes between 75% and 100% of the poverty line, contains families with adult equivalent incomes greater than $6,263 and less than $8,350. Families with negative or zero incomes are omitted and the data are weighted to reflect family size but are not weighted by CPS population weights.

Columns 2, 3 and 4 of Table 2.1 show mean family earnings and their standard errors by poverty income class. For example, column 2 shows that families in the 1st class, with incomes below 50 percent of the official poverty line, had total earnings of $855 per adult equivalent person, while those in the 2nd class received $2,244 per adult equivalent. As expected, adult equivalent family earnings generally increase as we go down a column.

In order to gauge the impact of family earnings on changes in headcount poverty we apply first order marginal (FOD) dominance to earnings over time. This requires comparing equivalent earnings at each poverty class across two years. Comparing 1995 earnings to 1990 earnings we find that in all cases except the 7th (top) class, which did not change (i.e., no statistically significant difference), earnings increased. Therefore we can conclude that in 1995 total family earnings played a larger role in reducing headcount poverty than 1990 family earnings.

Comparing columns 3 and 4 of Table 2.1 allows us to test for marginal FOD in earnings between 1995 and 1997. Again we find that the later year, 1997, dominates the earlier year, 1995. However, we note that there was no significant increase in family earnings for the 1st class, and classes 5, 6 and 7, which are all above 125 percent of the poverty line.

Columns 5, 6 and 7 of Table 2.1 consider only those earnings that are contributed by "all low-wage workers" as defined in Section IV.1 above. Columns 8, 9 and 10 further narrow the definition of earnings to only those workers classified in Section IV.1. as "minimum wage workers." Unlike total family earnings given in columns 2, 3 and 4 of Table 2.1, we do not expect low-wage or minimum wage earnings to necessarily be monotonically increasing in family income. We observe that below the poverty line, low-wage earners in income classes 1, 2 and 3 contribute roughly half of all equivalent adult earnings, while above the poverty line the contribution to total earnings is one third or less.

Comparing columns 5 and 6 of Table 2.1 we observe modest increases in the contributions of low-wage workers below the poverty line between 1990 and 1995. For example, families in the 3rd class with incomes between 75 and 100 percent of the poverty line have adult equivalent earnings of $1,280 in 1990 and $1,451 in 1995. In contrast, families in the 4th and higher classes experienced declines in the contribution of low-wage earnings, the 4th class specifically fell from $1,678 in 1990 to $1,352 in 1995. We point out that during this same time period total family earnings for this group was rising, suggesting that the average

individual worker in this income group enjoyed an increased level of earnings between 1990 and 1995.

Comparing columns 6 and 7 of Table 2.1 reveals the effects of the changing impact of low-wage work on family budgets between 1995 and 1997. This time period corresponds to changes in welfare payments resulting from the Welfare Reform Act of 1996. In contrast to the modest gains for families below the poverty line between 1990 and 1995, we find much larger gains in the bottom three income classes between 1995 and 1997. Similarly, while the contribution of low-wage workers above the poverty line actually fell between 1990 and 1995, we find increases in low-wage earnings for all income classes above the poverty line between 1995 and 1997.

The contribution of minimum wage earnings to the income of poor families is shown in columns 8, 9 and 10 of Table 2.1. The first thing to notice is that the adult equivalent contribution of minimum wage workers to family earnings is quite modest. For example, for families in income class 3 who are just below the poverty line the fractions of adult equivalent incomes contributed by minimum wage workers in 1990, 1995 and 1997 are 14 percent, 12 percent and 17 percent, respectively. Furthermore, the 1997 minimum wage earnings in this income class are $722, which is less than forty percent of the total low-wage contribution to earnings. Family members who are not low-wage workers contribute more than half of the adult equivalent earnings in families just below the poverty line.

The trend in minimum wage earnings over time closely tracks the earnings of all low-wage workers. Between 1990 and 1995 families below the poverty line experienced no change in minimum wage earnings, while families above the poverty line actually experienced a decline in minimum wage earnings. From 1995 to 1997, adult equivalent minimum wage earnings increased for families in all income classes, but as a share of adult equivalent family income the contribution remains small.

We now address questions relating to the effects of the EITC and payroll taxes on the incomes of poor families. As noted in Section II.2, we also consider the separate and combined effects of the EITC and payroll taxes and discuss the changing impacts across time. As in Table 2.1, Table 2.2 uses the same seven income classes determined as fractions of the official poverty line. Columns 2, 3 and 4 of Table 2.2 provide the adult equivalent values of EITC transfers for 1990, 1995 and 1997. In each of the three years the EITC transfers rise as family income increases up to the official poverty line and then begins to decline. In general, EITC benefits are concentrated in income classes 2, 3 and 4. Thus, families between 50 and 125 percent of the official poverty line receive the bulk of the benefits. We note a substantial increase in the EITC benefits between 1990 and 1995. After 1995, most of the growth in EITC benefits is concentrated on families below the poverty line.

There are several ways to gauge the importance of the EITC. First, we compare EITC benefits to the income midpoint of each poverty class. For example, families in income class 2 receive an EITC of $704 in 1997, which is 13 percent of the midpoint family income, $5,219. For families in income class 4, who are just above the official the poverty line, the 1997 average adult equivalent EITC payment of $630 is seven percent of midpoint family income. Alternatively, we can compare EITC payments to the family earnings in Table 2.1. For example, the average EITC of $704 for families in income class 2 in 1997 is 25 percent of total family earnings, which were $2,801. Similarly, for families in income class 4 the 1997 EITC payment of $630 is ten percent of family earnings.

Columns 5, 6 and 7 of Table 2.2 show the payroll taxes paid by poor families. In each of the three years considered, payroll taxes are monotonically increasing with income; i.e.,

they are larger as we consider higher income classes. For the most part, payroll taxes also increase across time for families in each income class. For example, for families in income classes 5, 6 and 7, who are above 125 percent of the official poverty line, payroll taxes rose modestly from 1990 to 1997, with increases ranging between 0 and 6 percent. For families below the official poverty line payroll taxes increased much more sharply, rising between 16 and 22 percent from 1990 to 1997.

One often stated purpose of the EITC is that it "offsets" payroll taxes paid by the poor. To investigate the relation between the EITC and payroll taxes we examine the combined effects of the two labor market policies. This is accomplished by comparing columns 2 and 5 of Table 2.2, which show the combined effects for 1990, to columns 3 and 6, and 4 and 7, which show the effects for 1995 and 1997, respectively. For 1990 we see that for families in income classes 1, 2 and 3, who are below the official poverty line, the net effect of the two policies is virtually a wash—EITC payments largely offset payroll taxes. But for low-income families above the poverty line in 1990, payroll taxes are substantially larger than EITC payments. For example, in 1990 for families in income class 5, who are between 125 and 150 percent of the official poverty line, the average EITC benefit of $255 falls $325 short of offsetting the average payroll tax of $580. Furthermore, we point out that we make the conservative assumption that workers bear none of the burden of the so-called "employer contribution" to payroll taxes. Thus, we consider only the "employee contribution" and, as a consequence, our estimates establish lower bounds on the (negative) impact of the payroll tax on poor families.[11]

The final three columns of Table 2.2 provide estimates of state and federal income taxes paid by low-income families. As expected, income taxes approach zero in the lowest income classes. Focusing on low-income families just above the poverty line we find that between 1990 and 1997 income tax per equivalent adult has systematically increased across time. For example, in income class 5 family adult equivalent income taxes rose from $190 to $278 between 1990 and 1997. It is of interest to note that these same families paid two to three times more in adult equivalent payroll taxes than in income taxes. However, for low-income families immediately above the official poverty line, average income taxes increased dramatically, while payroll taxes grew much more slowly.

The results reported in Tables 2.1 and 2.2 rely upon cash income and the Orshansky equivalence scale. We now focus on questions relating to the use of comprehensive income and the equivalence scales that the National Research Council (NRC) recommends as replacements for the Orshansky scales.[12] As discussed in Section III above, comprehensive income includes additions to and subtractions from cash income. Since virtually everyone would agree that comprehensive income is a better measure of family resources than cash income, it is important to investigate the net effect of these additions and subtractions at various poverty lines. Table 2.3 provides the additional comprehensive income that is received, but not counted in the official poverty statistics, by income class. With the exception of the poorest income class, the additional income received is a decreasing function of cash income. Over time we observe that the increment to income that occurs when we switch from cash to comprehensive income generally grows smaller. For income classes 1, 2, 5, 6 and 7 the increment declines from 1990 to 1995 and declines again from 1995 to 1997. For families in income classes 3 and 4, who are just below and immediately above the official poverty line, the increment increases slightly between 1990 and 1995, but falls sharply from 1995 to 1997.

To gauge the importance of using comprehensive income we can compare the amounts shown in columns 2, 3 and 4 of Table 2.3 to their respective income class midpoints. Recall that the poverty line per equivalent adult is $8,350. Thus, the midpoint of the 50 to 75 percent of the poverty line class is $5,219. The comprehensive income increment in this class is $1,930 in 1990, $1,820 in 1995, and $1,626 in 1997, or approximately one-third of cash income in each year. For families in income class 5, who have incomes between 100 and 125 percent of the official poverty line, the comprehensive income increment is approximately 15 percent of cash income.

Table 2.4 shows how families and persons are allocated to poverty classes using alternative definitions of income and equivalence scales for 1997. Comparing across income concepts and using the Orshansky scales we find a large decrease in the number of families and persons in the lowest two poverty classes as we move from cash to comprehensive income. In contrast, near the poverty line (75 to 100 percent) we find slight increases in the number of families or persons when we change from cash to comprehensive income. Holding the income concept constant and varying the equivalence scale we find a large increases in the number of families and persons below 125 percent of the poverty line when the NRC scale is used. This finding holds regardless of the income concept used.

Table 2.5 summarizes the differences in two policy variables, net EITC and minimum wage earnings when we change income concepts and switch equivalence scales. We note that while the change from cash to comprehensive income does not change the size of payroll taxes or EITC benefits. However, using NRC equivalence scales rather than Orshansky scales does change the effective magnitude of a tax or transfer. We point out that that the standard errors are omitted from Table 2.5.

Columns 2, 3, 4 and 5 of Table 2.5 examine the net EITC. We find that the official poverty methodology, which uses cash incomes and Orshansky scales, generally results in the most generous interpretation of the impact of the EITC and payroll taxes taken together. Switching from cash to comprehensive income suggests that the net EITC impacts are much smaller on the poorest two groups than use of cash income suggests. In general, the use of cash income and Orshansky scales results in the largest net transfers to the poor, while use of comprehensive income and the NRC scales provides evidence of much smaller poverty reducing effects.

The last four columns of Table 2.5 examine the contributions of minimum wage workers to family income using alternative income concepts and equivalence scales. As with the net EITC, the official methodology appears to suggest the greatest impact of minimum wage earnings on the well-being of low-income families and as a poverty-fighting policy alternative. Using comprehensive income, with either equivalence scale, tends to push the impact of the minimum wage earnings up the income scale and reduce its impact on poverty and the lowest income families.

IV.3. The Third Set of Research Questions

In a seminal contribution Nobel Laureate Amartya Sen (1976) has stressed the importance of considering the distribution of income and inequality among the poor. As a result of Sen's contribution and the work that followed, it is now widely agreed that inequality among the poor is a dimension of poverty that must be considered along with the headcount and absolute incomes of the poor. We now report results that address the research questions relating to inequality and poverty that are summarized in Section II.3 above. Specifically, we show the marginal effects of the net EITC (EITC - payroll taxes) and minimum wage earnings on the

inequality of incomes among the poor alternative poverty lines. To measure the change in inequality due to each income source we use the familiar Gini coefficient of inequality.

The procedure we employ is similar to the one that is widely used in studying the effects of taxes on inequality. For example, Gramlich et al. (1993) use Gini coefficients "Before" and "After" federal income taxes to evaluate the tax effects on inequality. We employ a similar procedure and use the Gini before the EITC and payroll taxes and after the EITC and payroll taxes to assess the combined effects of payroll taxes and the EITC on inequality among low-income families. We use the same procedures to estimate the effects of minimum wage earnings on inequality.

Table 3 presents Gini coefficients for net EITC and minimum wage earnings. The Gini is a measure of inequality based on the well-known Lorenz curve—the Gini ranges between 0 and 1 with larger values implying greater inequality. Estimates are provided for four combinations of cash income, comprehensive income, the Orshansky equivalence scales and the NRC equivalence scales. The *"Before"* Gini coefficient, represented by G_x, does not include either net EITC or minimum wage earnings. The *"After"* Gini coefficient, represented by G_y, denotes the Gini coefficient of combined income. The data used in making estimates of the impact of the net EITC and minimum wage earnings on inequality are restricted to adult equivalent incomes less than twice the official poverty line.

In contrast to the marginal dominance analysis of Section IV.2, the impact of both net EITC and minimum wage earnings on inequality among the low-income families is invariant to the particular combination of income concept and equivalence scale employed in making the estimates. Table 3 shows that irrespective of the income concept or equivalence scale used, the net EITC reduces inequality with the Gini falling by approximately 0.02 (7 percent). Minimum wage earnings also have an unambiguous inequality reducing impact. Table 3 shows that minimum wage earnings reduce inequality among the poor by approximately 0.04 (15 percent).

IV.4. The Fourth Set of Research Questions

We now report results that address the research questions outlined in Section II.4 above. These questions relate to dynamic changes in well-being and income sources of the same low-income families across time. The CPS is a rotating sample, and each March approximately 50 percent of the households that are surveyed also appear in the March survey of the preceding year. Thus, for most successive years (e.g., 1997 and 1998) it is possible to match the files across time and extract two years of panel data for the same families.[13] In this section we consider four two-year panels 1990-1991, 1993-1994, 1996-1997 and 1997-1998. These are calendar years and are selected because there were important changes in minimum wage laws between 1990 and 1991, and 1996 and 1997. Significant changes in the EITC occurred between 1993 and 1994. Further, the end of the Aid For Dependent Children (AFDC) program and implementation of the Temporary Assistance to Needy Families (TANF) and other welfare reforms are reflected in the 1996-1997 panel. In addition, minimum wage changes also occur during the 1996-1997 panel.

To address the research questions of interest we use subsamples of low-income families consisting of all families that can be matched in the files of successive years.[14] The sample size for matched two-year panels is generally about 30 percent of the low-income CPS sample size for a particular year. For example, the unweighted matched sample for 1996-1997 is 5,118, whereas the full sample of low-income families in 1996 is 16,615.

We first present evidence on changes in the sources of income across time. To put the results obtained when we track the same families in perspective, we begin by presenting results for all low-income families. To distinguish the full sample (where we do not track the same families) from results for the panel data, we refer to the former families as "anonymous." This means that we do not know the identities of the families and, in addition, we do not know whether the families in a particular income class in year 1 are in the same income class in year 2. In short, when we analyze two consecutive years and treat the CPS overlap as if it did not exist, we ignore the income dynamics and churning taking place within the income distribution.

Tables 4.1, 4.2, 4.3 and 4.4 report results for *anonymous* low-income families and the *same* low-income families for three time periods in the 1990s. These tables have two important differences when compared to the tables used in reporting the dominance results in Section IV.2 above. First, and most importantly, Tables 4.1-4.4 report comprehensive incomes without any adjustments for family size or composition. Second, the results are reported using four income classes rather than seven. These income classes are defined using the low-income cutoff, which is twice the official poverty line.

Tables 4.1.a-4.1.e decompose the incomes of *anonymous* low-income families by income sources. Table 4.1.a shows the results for anonymous families between 1990 and 1991, which is a period in which the minimum wage changed. Table 4.1.b provides results for anonymous families between 1993 and 1994, which is a period in which there where important changes in the EITC. Table 4.1.c and 4.1.d provide the same results for 1996-1997 and 1997-1998. Finally, Table 4.1.e covers the entire time period of our study, 1990-1998. All incomes are expressed in 1997 dollars with adjustments made using the CPI. All data is weighted using the CPS weights.

Table 4.1.a shows that families in the top three income classes in 1991 enjoyed a small increase in comprehensive income (between $76 and $209) over the similarly situated families in 1990. The sources of this growth are greater low-wage earnings, higher minimum wage earnings and higher EITC payments. While low-wage earnings grew, nonlow-wage earnings fell. For the bottom group (below 25 percent of the low-income cutoff) we find an $8 loss in income. In this group, increases in low-wage earnings are offset by declines in nonlow-wage earnings.

The data for anonymous families in 1993 and 1994 show increases in comprehensive income for all four income groups, while the 1996-1997 results (Table 4.1.c) show income declines in all four groups. For 1997-1998 (Table 4.1.d) the pattern is more similar to 1990-1991 with small increases in the top three income classes and a decline in the lowest income class.

For the entire time period of our study, 1990-1998 (Table 4.1.e), anonymous low-income families in the top three income classes experienced small gains ($214 to $340) in comprehensive income. Increases in EITC payments (column 7) and other low-wage earnings are the major source of income gains. Families in the lowest income class were hard hit, losing $940 in real income over this time period. The largest source of declining income was means-tested transfers (-$1,079). In most year-to-year comparisons increases in minimum wage earnings are not a major source of income gain for low-income families during the 1990s. The 1990-1991 period is an exception; the change in minimum wage earnings was fairly large relative to comprehensive income. However, it deserves reiteration that changes in the federal minimum wage have both ripple up and ripple down effects, impacting other low-wage earnings, which are generally (but not always) larger than the minimum wage earnings in Table 4.1.

The results in Table 4.1 obscure movement of families between income classes. As a consequence, the changes in incomes and their sources for the same families may diverge from those reported for anonymous families. As noted above, the CPS subsamples that provide information on the same families across time are considerably smaller than the samples of all (anonymous) low-income families. Tables 4.2.a-4.2.d use the procedures outlined in Section III.4 to decompose the incomes of the same families by income source. The CPS panel data do not allow us to make comparisons of the same families in 1990 and 1998.

Tracking the same families between 1990 and 1991 (Table 4.2.a) reveals substantial increases in incomes (column 1) in all four income classes. The increases are $9,187 for the lowest income class, which has incomes below 25 percent of the low-income cutoff in 1990, $3,305 for the next highest class, $3,659 for the income class just above the official poverty line, and $3,781 for the highest income class. These figures suggest that those families in the lowest income class are "different" from those in the other three income classes.

The sources of these changes for the same families are of considerable interest. Looking first at those families in the highest three income classes we observe that there are only small increases in minimum wage and other low-wage earnings (columns 2 and 3). In contrast, the increase in nonlow-wage earnings (column 4) is the largest single source of higher incomes in 1991.

In addition to nonlow-wage earnings, nonmeans tested transfers (column 9) and other income (column 10) show the largest changes for the same families between 1990 and 1991. The major source of other transfers is socia1 security but it also includes unemployment compensation. The additional important income source is "other income," which includes self-employment, pensions, alimony and child support, dividends, rents and interest. This source contributes a large share of the income change in each of the four income classes. In some cases the contribtions exceed 50 percent. Finally we note that the typical increase in payroll taxes (column 5) far exceeds any increase in the EITC (column 7).

As noted above the lowest income class in Table 4.2.a is unique. First of all, the increase in comprehensive income is more than twice the average of the other three income classes. Furthermore, the income decomposition suggests that there is a wide variation in how this extra income is obtained. Some families in this lowest income class are receiving their income gain in the form of additional transfers (columns 8 and 9); this group receives by far the largest transfer increase of any income class. Yet, this group also pays substantially more in payroll taxes (column 5), more than can be explained by their increase in wage earnings. This suggests that a large portion of other income (column 10) is earnings from self-employment.

Tables 4.2.b, 4.2.c, and 4.2.d provide the changes in means for the same families for 1993-1994, 1996-1997, and 1997-1998. These results support the conclusions drawn from the 1990-1991 data. In each case we find that families in the lowest income class differ substantially from the other income classes. For each time period considered, we find that increases in payroll taxes far outpace changes in the EITC, which are in fact often negative. Finally, we find additional support for the conclusion that minimum wage and other low-wage earnings play almost no role in explaining increases in same family income. Instead, we find that nonlow-wage earnings are the most important single source of additional income.

We now focus on more detailed data for the matched families across time. We use deciles of the 1997 low-income population and consider 1997 quantile functions and 1998 income concentration functions. We first consider all

low-income families in the 1997-1998 panel. We then focus on exit and entry from the welfare rolls between 1997 and 1998, which is the period in which the new rules and policies legislated by the Welfare Reform Act of 1996 were being implemented.

Tables 4.3 and 4.4 examine the distribution of income and earnings for the same families. The families are selected by being in the low-income population in 1997. The data are then divided into deciles by 1997 comprehensive income. The 1998 incomes that are reported are based upon the decile position of families in the 1997 distribution of income. The weighted two-year panel contains nearly 10 million families.

Table 4.3 considers all low-income families in the matched panel data. Columns 2, 3 and 4 provide the decile estimates of the 1997 quantile functions for cash income, comprehensive income and earnings. Columns 5, 6 and 7 provide the decile estimates of the 1998 income concentration functions for cash income, comprehensive income and earnings. Columns 8, 9 and 10 show the differences in income and earnings decomposed by deciles. The changes in all deciles are positive and, unexpectedly, quite large. Beginning with the first decile we observe a dramatic increase in income and earnings. Cash income (column 8) increased more than five fold ($11,158), comprehensive income more than four fold ($10,052), and earnings increased more than seven fold ($6,873). Important, but less dramatic, increases occur in the second decile; cash income, comprehensive income and earnings all approximately double in size.

In the middle of the low-income population, decile 5, we also find important increases in income. Decile 5 cash income increased by almost 50 percent ($5,509), comprehensive income increased by 35 percent ($4,265), and earnings increased by more than 65 percent ($3,865). Even those families that fall just under the low-income cutoff, decile 10, have noteworthy gains in income and earnings. Decile 10 cash incomes increased by nearly 30 percent ($8,510), comprehensive incomes rose by 17 percent ($5,119), and earnings jumped by 33 percent ($7,598). In sum, low-income families in each of the 10 income deciles in 1997 experienced significant increases in economic well-being between 1997 and 1998.

In addition to the large change in incomes and earnings that occur in every decile of Table 4.3 several other results warrant emphasis. Note that for all deciles comprehensive incomes (column 3) in 1997 are larger than cash incomes. The last row of Table 4.3 shows that overall, average 1997 comprehensive income (column 3) exceeded cash income in 1997 (column 2) by $1,216. In 1998, however, the comprehensive incomes exceeded cash incomes only in decile 7. The overall average cash income in 1998 exceeded the overall average comprehensive income by $515. Overall, average cash income rose by $7,516, a 58 percent increase. Average comprehensive income rose by $5,784 between 1997 and 1998, or 41 percent. Average earnings increased by $4,946 (71 percent).

The 1997-1998 CPS panel allows us to identify families that left welfare in 1997 for work in 1998. This subsample consists of all families in the 1997-1998 panel that received public assistance (welfare) in 1997 but did not receive public assistance in 1998. Table 4.4.a shows that these families had average cash incomes of $12,150 in 1997 (column 2), of which approximately 50 percent was derived from earnings ($5,618 in column 4). By 1998, average cash income was $13,710 (column 5) and earnings increased by more than two-thirds to $9,399 (column 7). Thus, the share of earnings grew from one-half to two-thirds of cash income as the families left welfare.

Focusing on decile 1 in Table 4.4.a we see that families at the very bottom who left welfare for work had 1997 cash incomes of $3,113, which increased more than 250 per-

cent to $8,799. First decile earnings increased from $609 in 1997 to $6,690 in 1998. In the middle of the distribution, decile 5, we find that cash incomes increased by nearly 20 percent, rising from $8,607 in 1997 to $10,269 in 1998. Decile 5 earnings grew from $3,268 in 1997 to $5,367 in 1998.

Above decile 5 we find that not all families that left welfare after 1997 were materially better off in 1998. Focusing on comprehensive income, we find that 1998 comprehensive incomes were lower in 1997 for deciles 6, 8, 9 and 10. Furthermore, even the more-narrow cash income concept, which excludes in-kind transfers, fell over time in deciles 8, 9 and 10. In sum, while the typical low-income family that left welfare between 1997 and 1998 had a significant increase in earnings ($3,780), comprehensive income increased only slightly by $410. It was the loss of food stamps, combined with the additional income and payroll taxes paid on earnings that resulted in such a small increase in comprehensive income for the average family that left welfare between 1997 and 1998.

Table 4.4.b examines the income changes between 1997 and 1998 for the families that received public assistance in 1997 and continued to receive assistance in 1998. These families stayed on welfare and are referred to as "stayers." Overall, column 8 shows that cash incomes grew by $2,165, comprehensive income grew by slightly less ($1,961), and that additional earnings ($1,755) accounted for most of this increase in income. The earnings growth of those staying on welfare was less than half of those who left (Table 4.4.a). Additionally, "stayers" were poorer in 1997 then "leavers." The comprehensive income of "stayers" in 1997 ($12,681) was 17 percent lower than comprehensive income of "leavers" ($15,279 from Table 4.4.a). Surprisingly, the gap in comprehensive income between "stayers" and "leavers" shrank after the "leavers" left welfare ($14,642 vs. $15,689).

To better interpret the results for families staying on and leaving welfare we also consider the families who entered welfare in 1998 but did not receive public assistance in 1997. Table 4.4.c, column 10, shows that on average, this group experienced losses of $1,645 in earnings. Those entering welfare are a "mixed-group"; in the bottom four deciles 1998 comprehensive incomes are significantly larger than in 1997. But in deciles 5, 7 and 10 1998 comprehensive incomes are lower than 1997 incomes. The largest gain among new welfare families was in the first decile (+$9,597) while the largest loss among new welfare families was in decile 10 (-$7,287).

The panel data for the same low-income families in Table 4.2 and 4.3 provides surprising results when compared to similar analysis that focuses on anonymous poor families. The two types of analysis must necessarily yield the same results if there was zero economic mobility among the low-income population, i.e., the order of families within the income distribution remained constant.[15] The results discussed above clearly imply that there must be substantial mobility or "churning" in the low-income distribution. In fact, the income changes associated with this mobility are so large that they make it difficult to sort out the effects of the EITC, low-wage earnings and payroll taxes when we focus on the same families using panel data.

The size of the income changes of the same families led us to investigate the income dynamics and mobility of American families using the data from the two-year matched CPS panels. We continue to focus on low-income families but we include the higher income families as well so that we can assess movements across the cutoff line separating the low- and higher income populations. Tables 4.5, 4.6, 4.7 and 4.8 provide mobility or transition matrices, which summarize the evidence on the income dynamics of American families during two-year intervals in the 1990s. Two types of mobility are shown in these tables—

mobility of families between the income classes of the low-income population and mobility into and out of the low-income population.

Table 4.5 shows the mobility of families in 1997 and 1998. Table 4.5.a shows the number of families moving into and out of low-income classes and the number of families who do not change classes. It also shows the number moving out of and moving into the low-income population. Table 4.5.b shows the same mobility but measures it using percents of families. Going across the row for income class 1, we see that there were 1.2 million families in this group in 1997. Of the 1.2 million families in income group 1 that we tracked in 1997, 248,000 (or 21 percent) had become higher income families in 1998, and only 368,000 (or 31 percent) remained in income class 1. If we think of the boundary between income class 1 and 2 as a poverty line, then 368,000 of the 1.2 million (31percent) remained in poverty in 1998.

Table 4.5 provides direct evidence on the churning that takes place in the American income distribution. Of the 9.8 million low-income families we tracked in 1997, nearly 3 million escaped the low-income classification in 1998. However, these families were nearly replaced with 2.7 million families that were in the higher income bracket in 1997, but lost ground and became poorer in 1998.

Table 4.5.b is a bit easier to interpret, so we focus on it rather than the absolute number of families shown in Table 4.5.a. The first cell of the Table 4.5.b shows that 31 percent of families in the bottom income class (incomes below 25 percent of the low-income cutoff) in 1997 remain in the same income class one year later. Moving horizontally across the first row we see that 24 percent of 1997 families in the bottom class move up to the next higher class, 17 percent move to the class with incomes between 50 and 75 percent of the cutoff, and 8 percent move to the highest income class within the low-income population. The last entry in the first row shows that 21 percent of the families in the very bottom income class in 1997 moved completely out of the low-income population in 1998.

Inspecting the diagonal of Table 4.5.b reveals the percentage of families that do not leave their 1997 income class between 1997 and 1998. The elements below the diagonal give the percentages of families who fall deeper into poverty, i.e. move down. For example, in the third row, 5 percent of 50-75 percent income class falls down to the bottom class between 1997 and 1998. The elements above the diagonal show the percentages of families that move to higher income classes. Finally, we call attention to the fact that the percentages below the diagonal are systematically smaller than those above the diagonal, which indicates that some low-income families in 1997 are leaving the low-income population altogether.

Tables 4.6, 4.7 and 4.8 provide mobility matrices for 1996-1997, 1993-1994, and 1990-1991, which are interpreted in the same manner as Table 4.5. A careful examination of these tables reveals a steady increase in mobility over time. For example, consider the rate at which families leave the low-income population. In the 1990-1991 panel only 23 percent of low-income families moved into the higher income group.[16] Comparable figures for 1993-1994, 1996-1997 and 1997-1998 are 26 percent, 27 percent and 30 percent, respectively.

Recall that groups 1 and 2 of the low-income population correspond to the official poverty population, which is given by rows 1 and 2 in in the first year of the panel and columns 1 and 2 in the second year. The mobility tables allow us to observe the rate at which families leave the officially measured poverty class. For example, in the two-year period 1990-1991, 34 percent of families in the bottom two groups in 1990 move up to groups 3, 4 or higher in 1991. Comparable figures for the 1993-1994, 1996-1997, and 1997-1998 panels are 42 percent, 46 percent, and 47 percent, respectively. Thus,

over the decade of the 1990s the transition of families out of poverty in the second year of the two-year panels increased in the mid to late 1990s compared to the 1990-1991 period. This means that in the early 1990s one-third of families who were poor in 1990 were not poor in 1991. In later years this rate of transition out of poverty increased to more than 40 percent.

Finally, we compare the percentage on the diagonals between 1990-1991 and 1997-1998. We find perceptibly more mobility in the mid and late 1990s than is observed in 1990-1991. The percentages on the diagonal in 1990-1991 are larger than in later years signaling less movement of families. Further, the percent of low-income families moving up to higher incomes and out of the low-income population altogether is smaller in 1990-1991 for all four income groups than in all other years. Thus, there is evidence of substantial income mobility among low-income American families and the CPS two-year panels strongly indicate that mobility increased after 1990-1991.

V. Conclusion

The research summarized in this report points to a number of conclusions with implications for public policy. Both the descriptive methods and dominance analysis indicate that earnings by minimum wage workers affect a relatively small number of low-income families. The impact of minimum wage workers' earnings on family incomes appears somewhat larger when an adult equivalent adjustment is made to family cash income and earnings using Orshansky adjustments for family size and composition. There is evidence that minimum wage earnings and other low-wage earnings increased in importance as sources of income to low-income families between 1995 and 1997. Welfare reform together with the long economic expansion of the 1990s may account for this growing importance in the late 1990s compared to smaller contributions in the early 1990s. However, for most low-income families earnings that do not come from low-wage work continue to be a more important source of income than earnings from minimum wage work.

The increases in EITC benefits between 1993 and 1994 substantially increased the well-being of low-income families. Between 1990 and 1997 average adult equivalent EITC benefits more than doubled for families below the official poverty line. For the poorest among the poor, with incomes below half of the official poverty line, average EITC benefits nearly quadrupled between 1990 and 1997. For families below the poverty line the EITC now generates more family income than minimum wage work. However, our analysis of *the combined effect of the EITC and payroll taxes reveals families just above the official poverty line pay (in 1997), on average, as much in payroll taxes as they receive from EITC benefits*.

The increases in EITC benefits in the early 1990s were targeted primarily at families below the official poverty line. Evidence from the March CPS reveals that these families did in fact receive the largest gains from the new EITC policy, but other low-income families also benefited. Low-income families above the official poverty line but below the low-income cutoff have much greater earnings than families below the poverty line, but only a small portion of these earnings are generated by low-wage work. The payroll taxes paid by these families exceed both federal and state income tax payments and EITC benefits in most cases. We find that the payroll taxes paid by low-income families above the poverty line grew slowly in the 1990s, while income taxes increased more rapidly.

Dominance analysis reveals that earnings from minimum wage work and EITC transfers both significantly reduced headcount poverty in the 1990s. This conclusion holds irrespective of where we draw the poverty line within the low-income population. However, the size of the impacts of the EITC and minimum wage

earnings in the first order dominance analysis are sensitive to the income concept employed and to the equivalence scale used to adjust for differences in the size and composition of families. The use of cash income and Orshansky scales yields results with the largest impacts, while comprehensive income and National Research Council equivalence scales suggest smaller effects. Inequality analysis reveals that minimum wage work and EITC transfers both generate more equality among low-income families. The inequality results are robust to the income concept and equivalence scale used in making the estimates.

The analysis of panel data for the same low-income families in 1997-1998 includes families that left welfare in 1997 for work in 1998. On average these families' earnings increased by 67 percent. In the bottom four deciles the earnings of those leaving welfare grew even faster, by factors of from three to ten in some cases. Surprisingly, those families who received public assistance in 1997 and continued to receive it in 1998 also experienced significant gains in earnings. Finally, the families in the panel data that did not receive welfare in 1997, but began receiving it in 1998 experienced a 21 percent decline in earnings.

Comparisons of the income gains of the full sample of *anonymous* low-income families to the gains of the *same* low-income families yields surprising results. By tracking the *same* families across time we expected to be able to make some inferences about the impacts of minimum wage earnings, the EITC and payroll taxes on the well-being of poor families that could not be garnered from the study of anonymous families. But the income changes associated with mobility and "churning" in the low-income distribution are so large that they make it difficult to sort out the influence of the EITC, transfer benifits, earnings and payroll taxes. One important result did shine through. Earnings of the same families rose dramatically from 1997 to 1998 and virtually all of the increase came from non-low wage work. The same dynamic changes we observe in 1997-1998 also occurred earlier in the 1990s.

The size of the income changes of the same families in the 1990s led us to investigate the income dynamics and mobility of American families using data from the two-year matched CPS panels. We find substantial mobility from one year to the next. Thirty percent of all low-income families in 1997 were no longer in the low-income population in 1998. In addition, more than 47 percent of the families below the official poverty line in 1997 were not below it in 1998. We find perceptibly more mobility in the mid and late 1990s than is observed in 1990-1991. The percentage of families that remain in the same income class in 1990-1991 is much larger than in later years, signaling less movement of families. Thus, there is evidence of substantial income mobility among low-income American families and the CPS two-year panels strongly indicate that mobility increased after 1990-1991. This mobility implies that measures based upon annual income statistics overstate the problems of poverty and the size of the low-income population when a two-year accounting period is used.

Table 1.1 Low-Wage Workers in 1999

	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
Number (1000s)	7,366	6,833	7,105	21,305
% of all Workers	5.5%	5.1%	5.3%	15.9%
% of all Low-Wage Workers	34.6%	32.1%	33.4%	100.0%

Table 1.2 Percent of Low-Wage Workers in 1999 by Selected Characteristics

	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
Male	4.4%	3.9%	4.1%	12.4%
Female	6.7%	6.4%	6.6%	19.7%
White	5.2%	5.0%	5.1%	15.2%
Non-White	7.0%	5.9%	6.5%	19.4%
Hispanic	7.9%	8.5%	8.5%	24.9%
Teenagers	21.3%	19.3%	13.9%	54.4%
Age 65 & Over	8.2%	7.3%	7.3%	22.8%
Other Age Groups	4.3%	4.0%	4.6%	13.0%
<12 Yrs. Schooling	13.9%	13.0%	11.5%	38.4%
>12 Yrs. Schooling	4.2%	3.8%	4.3%	12.3%

Table 1.3

Numbers and Percent of Low-Income Families with at Least One Low-Wage Worker, 1999*

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
100% of the low-income cutoff	3,465 (9.5%)	3,027 (8.3%)	2,788 (7.7%)	8,688 (23.9%)
75% of the cutoff	2,800 (10.9%)	2,315 (9.0%)	1,894 (7.4%)	6,594 (25.7%)
50% of the cutoff	1,952 (13.1%)	1,265 (8.5%)	908 (6.1%)	3,929 (26.4%)
25% of the cutoff	703 (12.4%)	395 (7.0%)	206 (3.6%)	1,260 (22.2%)

* Number is in thousands and proportions are in ( ).

Table 1.4

Percent of Family Income Contributed By Low-Wage Workers, 1999

1.4.a Cash Income

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
100% of the low-income cutoff	3.9%	4.7%	5.8%	14.5%
75% of the cutoff	5.8%	6.6%	6.8%	19.3%
50% of the cutoff	9.6%	7.8%	6.9%	24.3%
25% of the cutoff	15.1%	8.2%	4.7%	28.1%

1.4.b Comprehensive Income

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
100% of the low-income cutoff	3.6%	4.4%	5.4%	13.4%
75% of the cutoff	5.0%	5.8%	5.9%	16.8%
50% of the cutoff	7.5%	6.1%	5.4%	19.0%
25% of the cutoff	8.8%	4.8%	2.8%	16.4%

Table 1.5.a Real Wages of Low-Wage Workers ($ Per Hour, in 1997 dollars)

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1999				
100% of the low-income cutoff	$3.49	$5.11	$5.98	$4.77
75% of the cutoff	$3.48	$5.11	$5.96	$4.69
50% of the cutoff	$3.43	$5.12	$5.96	$4.50
25% of the cutoff	$3.38	$5.10	$5.94	$4.30
1998				
Low-income cutoff	$3.50	$5.12	$6.03	$4.78
75% of the cutoff	$3.47	$5.11	$6.01	$4.72
50% of the cutoff	$3.43	$5.10	$6.01	$4.53
25% of the cutoff	$3.26	$5.09	$5.99	$4.27
1996				
Low-income cutoff	$3.08	$4.44	$5.22	$4.24
75% of the cutoff	$3.05	$4.44	$5.21	$4.21
50% of the cutoff	$3.04	$4.46	$5.21	$4.09
25% of the cutoff	$2.94	$4.44	$5.21	$3.87
1991				
100% of the low-income cutoff	$3.12	$4.66	$5.40	$4.24
75% of the cutoff	$3.11	$4.66	$5.39	$4.19
50% of the cutoff	$3.08	$4.65	$5.38	$4.06
25% of the cutoff	$3.00	$4.66	$5.38	$3.89

Table 1.5.b Average Weekly Hours of Low-Wage Workers (Hours Worked Last Week)

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1999				
100% of the low-income cutoff	34.3	33.0	35.0	34.1
75% of the cutoff	34.6	32.9	34.3	33.9
50% of the cutoff	34.2	31.8	32.5	33.1
25% of the cutoff	31.6	28.2	27.2	29.9
1998				
100% of the low-income cutoff	35.0	33.2	34.9	34.4
75% of the cutoff	35.1	33.1	34.1	34.2
50% of the cutoff	33.7	31.3	31.5	32.4
25% of the cutoff	31.0	28.8	27.5	29.8
1996				
100% of the low-income cutoff	33.8	33.8	33.7	33.7
75% of the cutoff	33.9	33.6	33.6	33.7
50% of the cutoff	33.1	32.5	31.9	32.6
25% of the cutoff	30.2	27.3	29.5	29.2
1991				
100% of the low-income cutoff	33.2	33.2	34.2	33.4
75% of the cutoff	33.6	33.5	33.7	33.6
50% of the cutoff	33.1	32.4	31.4	32.6
25% of the cutoff	30.1	30.6	28.4	30.0

Table 1.5.c Real Earnings of Low-Wage Workers ($ Per Year)

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1998				
100% of the low-income cutoff	$4,872	$6,861	$9,169	$6,816
75% of the cutoff	$4,764	$6,604	$8,457	$6,365
50% of the cutoff	$4,421	$5,560	$7,040	$5,344
25% of the cutoff	$2,897	$2,818	$3,087	$2,903
1997				
100% of the low-income cutoff	$4,721	$6,969	$8,869	$6,691
75% of the cutoff	$4,570	$6,663	$8,239	$6,280
50% of the cutoff	$3,956	$5,439	$6,185	$4,917
25% of the cutoff	$2,519	$2,934	$2,326	$2,616
1995				
100% of the low-income cutoff	$3,938	$5,898	$7,192	$5,666
75% of the cutoff	$3,716	$5,657	$6,830	$5,373
50% of the cutoff	$3,445	$4,873	$5,487	$4,468
25% of the cutoff	$2,138	$2,815	$2,597	$2,431
1990				
100% of the low-income cutoff	$3,985	$5,724	$7,562	$5,511
75% of the cutoff	$3,881	$5,519	$7,060	$5,211
50% of the cutoff	$3,439	$4,679	$5,376	$4,236
25% of the cutoff	$2,347	$2,596	$2,818	$2,498

Table 1.6.a The Contributions of Low-Wage Earnings to Family Annual Cash Incomes Across Time*

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1998				
100% of the low-income cutoff	$499 (3.9%)	$607 (4.7%)	$746 (5.8%)	$1,851 (14.5%)
75% of the cutoff	$559 (5.8%)	$639 (6.6%)	$659 (6.8%)	$1,857 (19.3%)
50% of the cutoff	$613 (9.6%)	$498 (7.8%)	$443 (6.9%)	$1,554 (24.3%)
25% of the cutoff	$371 (15.1%)	$202 (8.2%)	$116 (4.7%)	$690 (28.1%)
1997				
100% of the low-income cutoff	$515 (4.1%)	$693 (5.4%)	$765 (6.0%)	$1,973 (15.5%)
75% of the cutoff	$569 (5.9%)	$714 (7.4%)	$719 (7.5%)	$2,002 (20.8%)
50% of the cutoff	$567 (8.9%)	$523 (8.2%)	$420 (6.6%)	$1,510 (23.6%)
25% of the cutoff	$355 (13.5%)	$225 (8.6%)	$104 (4.0%)	$684 (26.0%)
1995				
100% of the low-income cutoff	$313 (2.4%)	$440 (3.4%)	$570 (4.5%)	$1,323 (10.3%)
75% of the cutoff	$335 (3.4%)	$452 (4.6%)	$578 (5.9%)	$1,365 (14.0%)
50% of the cutoff	$387 (5.9%)	$404 (6.1%)	$417 (6.3%)	$1,208 (18.3%)
25% of the cutoff	$272 (9.6%)	$175 (6.2%)	$135 (4.8%)	$582 (20.6%)
1990				
100% of the low-income cutoff	$380 (3.0%)	$500 (3.9%)	$493 (3.9%)	$1,373 (10.7%)
75% of the cutoff	$404 (4.2%)	$514 (5.3%)	$459 (4.7%)	$1,377 (14.2%)
50% of the cutoff	$417 (6.3%)	$428 (6.5%)	$298 (4.5%)	$1,143 (17.3%)
25% of the cutoff	$316 (10.5%)	$199 (6.6%)	$103 (3.4%)	$619 (20.5%)

* Percent contribution is in ( ).

Table 1.6.b The Contributions of Low-Wage Earnings to Family Comprehensive Incomes Across Time*

Families Below	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1998				
100% of the low-income cutoff	$499 (3.6%)	$607 (4.4%)	$746 (5.4%)	$1,851 (13.4%)
75% of the cutoff	$559 (5.0%)	$639 (5.8%)	$659 (5.9%)	$1,857 (16.8%)
50% of the cutoff	$613 (7.5%)	$498 (6.1%)	$443 (5.4%)	$1,554 (19.0%)
25% of the cutoff	$371 (8.8%)	$202 (4.8%)	$116 (2.8%)	$690 (16.4%)
1997				
100% of the low-income cutoff	$515 (3.7%)	$693 (5.0%)	$765 (5.6%)	$1,973 (14.3%)
75% of the cutoff	$569 (5.1%)	$714 (6.4%)	$719 (6.4%)	$2,002 (17.9%)
50% of the cutoff	$567 (6.8%)	$523 (6.3%)	$420 (5.1%)	$1,510 (18.2%)
25% of the cutoff	$355 (7.7%)	$225 (4.9%)	$104 (2.3%)	$684 (14.9%)
1995				
100% of the low-income cutoff	$313 (2.2%)	$440 (3.1%)	$570 (4.1%)	$1,323 (9.4%)
75% of the cutoff	$335 (2.9%)	$452 (3.9%)	$578 (5.0%)	$1,365 (11.9%)
50% of the cutoff	$387 (4.5%)	$404 (4.7%)	$417 (4.8%)	$1,208 (14.0%)
25% of the cutoff	$272 (5.6%)	$175 (3.6%)	$135 (2.8%)	$582 (12.0%)
1990				
100% of the low-income cutoff	$380 (2.8%)	$500 (3.6%)	$493 (3.6%)	$1,373 (10.0%)
75% of the cutoff	$404 (3.6%)	$514 (4.6%)	$459 (4.1%)	$1,377 (12.4%)
50% of the cutoff	$417 (4.9%)	$428 (5.1%)	$298 (3.5%)	$1,143 (13.6%)
25% of the cutoff	$316 (6.2%)	$199 (3.9%)	$103 (2.0%)	$619 (12.0%)

* Percent contribution is in ( ).

Table 1.7.a The Contributions of Low-Wage Earnings to Family Cash Incomes Across Time Among Different Types of Families*

Family Type	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1998				
White Families	$503 (3.9%)	$611 (4.7%)	$713 (5.5%)	$1,827 (14.1%)
Non-White Families	$485 (4.0%)	$594 (4.8%)	$853 (7.0%)	$1,931 (15.7%)
Female Family Heads	$550 (4.3%)	$758 (5.9%)	$910 (7.1%)	$2,217 (17.2%)
Hispanic Families	$887 (6.1%)	$1,160 (8.0%)	$1,219 (8.4%)	$3,266 (22.6%)
1997				
White Families	$511 (4.0%)	$678 (5.3%)	$755 (5.9%)	$1,944 (15.1%)
Non-White Families	$529 (4.3%)	$745 (6.1%)	$800 (6.6%)	$2,075 (17.0%)
Female Family Heads	$551 (4.4%)	$769 (6.1%)	$845 (6.7%)	$2,165 (17.2%)
Hispanic Families	$878 (6.2%)	$1,288 (9.0%)	$1,399 (9.8%)	$3,565 (25.0%)
1995				
White Families	$302 (2.3%)	$431 (3.3%)	$565 (4.3%)	$1,297 (10.0%)
Non-White Families	$355 (2.9%)	$472 (3.9%)	$590 (4.9%)	$1,416 (11.7%)
Female Family Heads	$334 (2.7%)	$563 (4.5%)	$579 (4.6%)	$1,477 (11.7%)
Hispanic Families	$425 (3.0%)	$812 (5.8%)	$921 (6.6%)	$2,157 (15.4%)
1990				
White Families	$376 (2.9%)	$468 (3.6%)	$491 (3.8%)	$1,335 (10.2%)
Non-White Families	$394 (3.3%)	$615 (5.2%)	$500 (4.2%)	$1,509 (12.8%)
Female Family Heads	$411 (3.4%)	$581 (4.8%)	$484 (4.0%)	$1,475 (12.2%)
Hispanic Families	$536 (3.8%)	$862 (6.1%)	$879 (6.2%)	$2,276 (16.1%)

* Percent contribution is in ( ).

Table 1.7.b The Contributions of Low-Wage Earnings to Family Comprehensive Incomes Across Time Among Different Types of Families*

Family Type	Sub-Minimum Wage Workers	Minimum Wage Workers	Near-Minimum Wage Workers	All Low-Wage Workers
1998				
White Families	$503 (3.6%)	$611 (4.4%)	$713 (5.1%)	$1,827 (13.1%)
Non-White Families	$485 (3.6%)	$594 (4.4%)	$853 (6.3%)	$1,931 (14.4%)
Female Family Heads	$550 (3.6%)	$758 (5.0%)	$910 (6.0%)	$2,217 (14.7%)
Hispanic Families	$887 (5.8%)	$1,160 (7.6%)	$1,219 (8.0%)	$3,266 (21.3%)
1997				
White Families	$511 (3.7%)	$678 (4.9%)	$755 (5.4%)	$1,944 (14.0%)
Non-White Families	$529 (3.9%)	$745 (5.6%)	$800 (6.0%)	$2,075 (15.5%)
Female Family Heads	$551 (3.7%)	$769 (5.2%)	$845 (5.7%)	$2,165 (14.5%)
Hispanic Families	$878 (5.8%)	$1,288 (8.4%)	$1,399 (9.2%)	$3,565 (23.4%)
1995				
White Families	$302 (2.1%)	$431 (3.0%)	$565 (4.0%)	$1,297 (9.2%)
Non-White Families	$355 (2.6%)	$472 (3.5%)	$590 (4.4%)	$1,416 (10.5%)
Female Family Heads	$334 (2.2%)	$563 (3.8%)	$579 (3.9%)	$1,477 (9.9%)
Hispanic Families	$425 (2.8%)	$812 (5.4%)	$921 (6.1%)	$2,157 (14.3%)
1990				
White Families	$376 (2.7%)	$468 (3.4%)	$491 (3.5%)	$1,335 (9.6%)
Non-White Families	$394 (3.0%)	$615 (4.7%)	$500 (3.8%)	$1,509 (11.6%)
Female Family Heads	$411 (2.9%)	$581 (4.2%)	$484 (3.5%)	$1,475 (10.6%)
Hispanic Families	$536 (3.6%)	$862 (5.8%)	$879 (6.0%)	$2,276 (15.4%)

* Percent contribution is in ( ).

Table 2.1 First-Order Marginal Dominance Comparisons of the Impact of Earnings on Low-Income Families (Adult Equivalent[1] Cash Incomes in 1997 Dollars)

Income Class[2]	Fraction of Poverty Line	Family Earnings			Low-Wage Earnings			Minimum Wage Earnings		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50% {$2,088}	$855 (30)	$994 (27)	$1,071 (29)	$432 (21)	$489 (22)	$625 (24)	$139 (13)	$152 (13)	$195 (14)
2	50% to 75% {$5,219}	$2,244 (55)	$2,603 (52)	$2,801 (52)	$1,152 (46)	$1,222 (45)	$1,614 (48)	$382 (29)	$393 (27)	$553 (32)
3	75% to 100% {$7,306}	$3,593 (66)	$4,040 (63)	$4,223 (62)	$1,280 (49)	$1,451 (50)	$1,936 (55)	$494 (32)	$492 (30)	$722 (37)
4	100% to 125% {$9,394}	$5,339 (81)	$5,549 (77)	$6,010 (76)	$1,678 (60)	$1,352 (53)	$2,156 (65)	$569 (37)	$540 (36)	$784 (42)
5	125% to 150% {$11,481}	$7,251 (94)	$7,712 (89)	$7,789 (89)	$1,707 (65)	$1,416 (56)	$2,088 (68)	$677 (44)	$444 (32)	$747 (42)
6	150% to 175% {$13,569}	$9,024 (109)	$9,559 (102)	$9,303 (106)	$1,788 (71)	$1,257 (55)	$1,726 (68)	$597 (41)	$396 (31)	$571 (39)
7	175% to 200% {$15,656}	$11,100 (117)	$11,253 (118)	$11,575 (112)	$1,514 (66)	$1,221 (57)	$1,621 (67)	$604 (15)	$415 (34)	$541 (39)

Midpoint of poverty class in { }. Standard errors are in ( ).

1. Family Cash Incomes are adjusted for size and composition using Orshansky equivalence scales.

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fractions of the low-income cutoff.

Table 2.2 First-Order Marginal Dominance Comparison of the Impact of the EITC, Payroll and Income Taxes on Low-Income Families (Adult Equivalent[1] Cash Incomes in 1997 Dollars)

Income Class[2]	Fraction of Poverty Line	EITC			Payroll Taxes[3]			Income Taxes		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50% {$2,088}	$79 (3)	$238 (8)	$302 (10)	$77 (3)	$81 (2)	$91 (3)	$3 (1)	$2 (0)	$3 (1)
2	50% to 75% {$5,219}	$215 (6)	$604 (15)	$704 (16)	$192 (5)	$211 (5)	$234 (5)	$9 (1)	$12 (2)	$14 (2)
3	75% to 100% {$7,306}	$269 (6)	$649 (14)	$725 (14)	$295 (6)	$325 (6)	$341 (6)	$31 (2)	$41 (2)	$42 (2)
4	100% to 125% {$9,394}	$268 (6)	$609 (13)	$630 (13)	$426 (7)	$434 (7)	$471 (7)	$78 (3)	$88 (3)	$130 (4)
5	125% to 150% {$11,481}	$255 (6)	$457 (11)	$450 (11)	$580 (9)	$605 (750)	$616 (8)	$190 (5)	$234 (6)	$278 (6)
6	150% to 175% {$13,569}	$180 (6)	$315 (9)	$327 (10)	$722 (11)	$750 (11)	$725 (10)	$368 (7)	$472 (8)	$486 (9)
7	175% to 200% {$15,656}	$138 (5)	$214 (8)	$177 (7)	$867 (11)	$857 (11)	$900 (11)	$602 (10)	$732 (11)	$811 (11)

Midpoint of poverty class in { }. Standard errors are in ( ).

1. Family Cash Incomes are adjusted for size and composition using Orshansky equivalence scales.

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fractions of the low-income cutoff.

3. Payroll taxes include only the "employee's share" of the tax.

Table 2.3

Increments to Family Incomes When the Definition of Income Concept is Changed from Cash to Comprehensive[1]

Income Class[2]	Fraction of Poverty Line	Income Increment Added by Adjusting for Comprehensive Income		
		1990	1995	1997
	1	2	3	4
1	Below 50% {$2,088}	$1,880 (51)	$1,662 (36)	$1,582 (33)
2	50% to 75% {$5,219}	$1,930 (48)	$1,820 (38)	$1,626 (35)
3	75% to 100% {$7,306}	$1,502 (45)	$1,589 (37)	$1,443 (34)
4	100% to 125% {$9,394}	$1,301 (50)	$1,310 (39)	$972 (33)
5	125% to 150% {$11,481}	$999 (65)	$813 (44)	$572 (48)
6	150% to 175% {$13,569}	$526 (59)	$309 (48)	$196 (44)
7	175% to 200% {$15,656}	$75 (56)	-$197 (69)	-$496 (53)

Midpoint of poverty class in { }. Standard errors are in ( ).

1. Incomes are adjusted for size and composition using Orshansky equivalence scales. Payroll taxes include only the "employee's share" of the tax.

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.

Table 2.4 Headcounts of Poor Families and Persons, Using Cash and Comprehensive Incomes and Two Equivalence Scales, 1997 Estimates at Alternative Poverty Lines

Income Class	Fraction of Poverty Line	Orshansky Scale				NRC Scale			
		Cash		Comprehensive		Cash		Comprehensive	
		Family	Persons	Family	Persons	Family	Persons	Family	Persons
	1	2	3	4	5	6	7	8	9
1	Below 50%	2,287	8,541	1,736	5,468	2,911	11,399	2,177	7,879
2	50% to 75%	2,122	7,482	1,696	6,412	2,799	10,360	2,478	9,784
3	75% to 100%	2,727	9,388	2,734	9,575	3,518	12,264	3,774	14,038
4	100% to 125%	2,839	9,716	3,147	11,188	3,585	12,354	4,330	15,764
5	125% to 150%	2,805	9,623	3,464	12,726	3,235	11,319	3,209	10,286
6	150% to 175%	2,713	9,442	2,992	10,728	1,371	3,095	1,551	3,186
7	175% to 200%	2,813	9,606	1,564	5,172	845	845	533	916

Table 2.5 Net EITC and Minimum Wage Earnings by Income Concept and Equivalent Scale, 1997

Income Class	Fraction of Poverty Line	Net EITC*				Minimum Wage Earnings			
		Orshansky Scale		NRC Scale		Orshansky Scale		NRC Scale	
		Cash	Comprehensive	Cash	Comprehensive	Cash	Comprehensive	Cash	Comprehensive
	1	2	3	4	5	6	7	8	9
1	Below 50%	$211	$76	$239	$105	$195	$129	$237	$129
2	50% to 75%	$470	$230	$350	$260	$553	$311	$522	$430
3	75% to100%	$384	$311	$132	$132	$722	$625	$553	$584
4	100% to 125%	$159	$170	-$168	-$211	$784	$910	$541	$613
5	125% to 150%	-$166	-$183	-$489	-$295	$747	$695	$520	$464

* Net EITC is the EITC less payroll taxes.

Table 3 Change in Inequality Due to Net EITC and Minimum Wage Earnings, 1997

Method		Net EITC			Minimum Wage Earnings		
		Before Gini	After Gini	Difference	Before Gini	After Gini	Difference
Orshansky Scale	Cash	0.257	0.238	-0.019 (0.001)	0.295	0.257	-0.038 (0.001)
	Comprehensive	0.224	0.238	0.014 (0.001)	0.246	0.208	-0.038 (0.001)
NRC Scale	Cash	0.260	0.240	-0.020 (0.001)	0.299	0.260	-0.039 (0.002)
	Comprehensive	0.229	0.213	-0.016 (0.001)	0.251	0.213	-0.038 (0.002)

Standard errors are in ( ).

Table 4.1.a Changes in Conditional Mean Incomes and Taxes for Anonymous Families by Source

1990-1991

Families Between	Compre-hensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$209	$171	$388	-$780	-$37	-$27	$18	$46	$294	$7
50 and 75% of the Low-income cutoff	$160	$274	$463	-$689	-$9	-$32	$51	-$3	$76	-$53
25 and 50% of the Low-income cutoff	$76	$61	$276	-$400	$2	$2	$62	$72	-$84	$94
Below 25% of the Low-income cutoff	-$8	-$22	$101	-$91	-$1	-$9	$11	$135	-$39	-$113

Table 4.1.b Changes in Conditional Mean Incomes and Taxes for Anonymous Families by Source

1993-1994

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$160	-$45	-$25	-$173	-$21	-$24	$68	-$23	$216	$99
50 and 75% of the Low-income cutoff	$172	-$115	-$34	$300	-$7	-$32	$150	-$28	-$139	-$2
25 and 50% of the Low-income cutoff	$372	-$62	$28	$145	$16	$28	$225	-$24	-$121	$226
Below 25% of the Low-income cutoff	$286	$20	-$42	$120	-$3	-$23	$93	-$59	-$35	$162

Table 4.1.c Changes in Conditional Mean Incomes and Taxes for Anonymous Families by Source

1996-1997

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	-$122	-$24	$313	-$657	$10	-$4	-$3	-$40	$80	$214
50 and 75% of the Low-income cutoff	-$148	$89	$392	-$558	-$2	-$20	$1	-$124	$115	-$85
25 and 50% of the Low-income cutoff	-$52	$7	$184	-$136	$4	-$14	$43	-$247	$66	$21
Below 25% of the Low-income cutoff	-$432	-$50	-$25	-$35	-$8	$2	-$29	-$200	$54	-$154

Table 4.1.d

Changes in Conditional Mean Incomes and Taxes for Anonymous Families by Source

1997-1998

Families Between	Compre-hensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$296	-$114	$49	$322	$10	-$155	$30	-$16	-$15	-$103
50 and 75% of the Low-income cutoff	$90	-$139	-$256	$444	$10	$26	$30	-$4	$75	-$26
25 and 50% of the Low-income cutoff	$64	-$21	$102	$233	$13	-$16	$74	-$85	$52	-$295
Below 25% of the Low-income cutoff	-$392	-$23	$28	$19	$5	$89	$8	-$338	-$10	$17

Table 4.1.e Changes in Conditional Mean Incomes and Taxes for Anonymous Families by Source

1990-1998

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$305	$65	$413	-$587	-$33	-$233	$231	$50	$385	-$519
50 and 75% of the Low-income cutoff	$214	$197	$374	-$401	-$1	-$56	$427	-$57	$215	-$598
25 and 50% of the Low-income cutoff	$340	$127	$525	-$13	$43	$16	$598	-$411	-$64	-$362
Below 25% of the Low-income cutoff	-$940	$3	$68	$9	$7	$144	$205	-$1,079	-$66	$72

Table 4.2.a Changes in Conditional Mean Incomes and Taxes for the Same Families by Source

1990-1991

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$3,781	$162	$382	$1,542	$196	$1,191	$56	$149	$967	$1,909
50 and 75% of the Low-income cutoff	$3,659	$240	$108	$2,292	$274	$933	$8	-$69	$956	$1,331
25 and 50% of the Low-income cutoff	$3,305	-$32	$74	$2,021	$212	$530	-$46	-$54	$1,008	$1,076
Below 25% of the Low-income cutoff	$9,187	$443	$274	$2,832	$638	$1,270	$71	$423	$2,131	$4,919

Table 4.2.b Changes in Conditional Mean Incomes and Taxes for the Same Families by Source

1993-1994

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$4,903	-$59	$97	$3,396	$308	$1,256	$89	-$108	$1,270	$1,782
50 and 75% of the Low-income cutoff	$5,305	-$160	-$55	$4,335	$335	$1,439	$48	-$86	$1,006	$1,988
25 and 50% of the Low-income cutoff	$5,723	$132	-$85	$4,132	$379	$833	-$16	$4	$1,703	$1,065
Below 25% of the Low-income cutoff	$10,471	$89	$321	$4,135	$557	$868	$223	$371	$2,844	$3,914

Table 4.2.c

Changes in Conditional Mean Incomes and Taxes for the Same Families by Source

1996-1997

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$5,210	-$132	$581	$3,128	$348	$1,541	$5	-$45	$1,406	$2,157
50 and 75% of the Low-income cutoff	$5,400	-$60	-$3	$4,707	$423	$1,609	-$192	-$80	$1,153	$1,906
25 and 50% of the Low-income cutoff	$5,905	-$150	$339	$3,609	$388	$936	-$247	-$317	$2,382	$1,613
Below 25% of the Low-income cutoff	$12,525	$329	$422	$8,240	$729	$2,088	$135	-$230	$2,868	$3,579

Table 4.2.d Changes in Conditional Mean Incomes and Taxes for the Same Families by Source

1997-1998

Families Between	Comprehensive Income 1	Minimum Wage Earnings 2	Other Low-Wage Earnings 3	Non Low-Wage Earnings 4	Payroll Taxes 5	Other Taxes 6	Earned Income Tax Credit 7	Means Tested Transfers 8	Other Transfers 9	Other Income 10
75 and 100% of the Low-income cutoff	$5,451	-$166	-$117	$4,857	$388	$1,564	-$9	-$72	$1,183	$1,726
50 and 75% of the Low-income cutoff	$6,042	-$223	-$562	$6,277	$427	$1,925	-$212	-$183	$1,307	$1,987
25 and 50% of the Low-income cutoff	$6,204	-$235	$73	$4,900	$411	$1,212	-$212	-$47	$1,844	$1,504
Below 25% of the Low-income cutoff	$12,352	$261	$422	$6,315	$792	$1,338	$258	$46	$3,528	$3,652

Table 4.3

The Distributions of Income and Earnings for the Same Low-Income Families Before and After Welfare Reform, 1997-1998

Ordered by Family Income in 1997	Number of Families (1000s)	Conditional Mean Incomes and Earnings[1]						Changes in Incomes and Earnings[2]		
		1997			1998					
		Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings
	1	2	3	4	5	6	7	8	9	10
Decile 1	964	$2,341	$3,049	$1,009	$13,499	$13,101	$7,882	$11,158	$10,052	$6,873
Decile 2	967	$6,250	$6,779	$1,736	$12,679	$12,314	$5,543	$6,429	$5,535	$3,808
Decile 3	965	$7,862	$8,615	$2,749	$14,096	$13,828	$7,038	$6,234	$5,213	$4,289
Decile 4	967	$9,757	$10,462	$4,123	$16,264	$16,049	$8,462	$6,507	$5,587	$4,339
Decile 5	966	$11,834	$12,244	$5,821	$17,343	$16,509	$9,686	$5,509	$4,265	$3,865
Decile 6	967	$12,302	$14,016	$4,497	$18,948	$18,853	$8,731	$6,646	$4,837	$4,234
Decile 7	966	$14,056	$16,103	$5,858	$20,623	$21,108	$8,917	$6,566	$5,005	$3,059
Decile 8	962	$16,598	$18,531	$8,744	$26,932	$26,370	$15,856	$10,333	$7,839	$7,112
Decile 9	967	$19,580	$21,852	$12,078	$26,864	$26,260	$16,365	$7,284	$4,408	$4,288
Decile 10	969	$28,646	$29,736	$23,002	$37,156	$34,855	$30,600	$8,510	$5,119	$7,598
Overall	9,661	$12,927	$14,143	$6,966	$20,443	$19,928	$11,912	$7,516	$5,784	$4,946

1. The conditional means are the average income and earnings for the same families in 1997 and 1998 who were in the indicated deciles of the 1997 income distribution, i.e., 1997 and 1998 incomes and earnings are ordered by the families position in the income distribution before welfare reform.
2. This is the absolute change for the same families in a given decile between 1997 and 1998.

Table 4.4.a The Distributions of Income and Earnings for the Same Families Before and After Welfare Reform Low-Income Families that Left Welfare for Work, 1997-1998

Ordered by Family Income in 1997	Number of Families	Conditional Mean Incomes and Earnings[1]						Changes in Incomes and Earnings[2]		
		1997			1998					
		Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings
	1	2	3	4	5	6	7	8	9	10
Decile 1	27,571	$3,113	$4,376	$609	$8,799	$8,878	$6,690	$5,686	$4,502	$6,081
Decile 2	28,028	$4,552	$6,679	$706	$9,539	$11,553	$6,701	$4,987	$4,874	$5,995
Decile 3	29,253	$5,636	$8,490	$575	$7,542	$9,637	$4,678	$1,906	$1,147	$4,102
Decile 4	30,053	$7,123	$9,972	$3,016	$11,096	$12,335	$8,902	$3,973	$2,364	$5,887
Decile 5	28,833	$8,607	$12,000	$3,268	$10,269	$12,400	$5,367	$1,663	$400	$2,099
Decile 6	29,400	$9,546	$13,727	$3,114	$11,381	$13,283	$7,218	$1,834	-$444	$4,104
Decile 7	28,335	$12,043	$15,803	$3,913	$14,872	$18,206	$8,719	$2,829	$2,403	$4,806
Decile 8	26,728	$15,184	$19,336	$7,227	$11,378	$15,238	$7,863	-$3,806	-$4,098	$636
Decile 9	31,298	$20,884	$24,248	$13,249	$19,139	$21,197	$16,502	-$1,745	-$3,050	$3,253
Decile 10	29,756	$33,353	$36,655	$19,378	$31,801	$33,013	$20,209	-$1,552	-$3,642	$832
Overall	289,256	$12,150	$15,279	$5,618	$13,710	$15,689	$9,399	$1,560	$410	$3,780

1. The conditional means are the average income and earnings for the same families in 1997 and 1998 who were in the indicated deciles of the 1997 income distribution, i.e., 1997 and 1998 incomes and earnings are ordered by the families position in the income distribution before welfare reform.
2. This is the absolute change for the same families in a given decile between 1997 and 1998.

Table 4.4.b The Distributions of Income and Earnings for the Same Families Before and After Welfare Reform
Low-Income Families That Did Not Leave Welfare for Working (Families Remaining in Welfare), 1997-1998

Ordered by Family Income in 1997	Number of Families	Conditional Mean Incomes and Earnings[1]						Changes in Incomes and Earnings[2]		
		1997			1998					
		Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings
	1	2	3	4	5	6	7	8	9	10
Decile 1	30,694	$2,103	$3,403	$177	$5,223	$7,530	$1,191	$3,120	$4,127	$1,014
Decile 2	36,969	$3,835	$6,405	$491	$9,450	$11,349	$4,016	$5,616	$4,944	$3,525
Decile 3	32,357	$4,616	$8,061	$174	$7,044	$9,545	$2,508	$2,428	$1,485	$2,334
Decile 4	34,319	$6,498	$9,082	$1,188	$9,327	$12,552	$3,034	$2,829	$3,471	$1,846
Decile 5	33,103	$7,791	$10,254	$985	$8,555	$11,134	$1,099	$763	$879	$114
Decile 6	33,080	$7,806	$11,646	$971	$10,308	$13,736	$1,969	$2,502	$2,090	$998
Decile 7	35,785	$10,171	$13,245	$2,996	$10,203	$13,902	$4,049	$32	$657	$1,053
Decile 8	34,121	$10,965	$15,364	$1,947	$12,474	$16,908	$3,183	$1,509	$1,545	$1,236
Decile 9	32,931	$15,995	$18,782	$2,761	$15,874	$18,568	$4,387	-$121	-$214	$1,626
Decile 10	35,092	$21,914	$29,549	$5,950	$24,676	$30,108	$9,466	$2,761	$560	$3,516
Overall	338,452	$9,244	$12,681	$1,797	$11,409	$14,642	$3,551	$2,165	$1,961	$1,755

1. The conditional means are the average income and earnings for the same families in 1997 and 1998 who were in the indicated deciles of the 1997 income distribution, i.e., 1997 and 1998 incomes and earnings are ordered by the families position in the income distribution before welfare reform.
2. This is the absolute change for the same families in a given decile between 1997 and 1998.

Table 4.4.c The Distributions of Income and Earnings for the Same Families Before and After Welfare Reform
Low-Income Families That Enter Into Welfare (Families Entering Welfare), 1997-1998

Ordered by Family Income in 1997	Number of Families	Conditional Mean Incomes and Earnings[1]						Changes in Incomes and Earnings[2]		
		1997			1998					
		Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings	Cash	Comprehensive	Earnings
1997	1	2	3	4	5	6	7	8	9	10
Decile 1	12,161	$183	$974	$53	$8,574	$10,571	$5,901	$8,391	$9,597	$5,849
Decile 2	14,225	$1,587	$3,684	$1,474	$3,184	$6,597	$1,127	$1,596	$2,913	-$347
Decile 3	16,767	$5,463	$6,535	$2,046	$6,516	$8,825	$2,957	$1,053	$2,290	$911
Decile 4	13,389	$6,449	$8,873	$777	$10,090	$13,467	$403	$3,641	$4,594	-$374
Decile 5	15,023	$9,944	$13,293	$3,120	$9,183	$12,652	$3,111	-$761	-$642	-$9
Decile 6	13,383	$12,520	$15,769	$7,446	$16,060	$19,562	$9,969	$3,540	$3,793	$2,524
Decile 7	14,720	$16,097	$17,423	$12,941	$9,836	$11,829	$3,078	-$6,262	-$5,595	-$9,863
Decile 8	11,711	$14,983	$19,214	$6,198	$18,761	$23,344	$5,286	$3,777	$4,129	-$912
Decile 9	17,878	$19,944	$23,604	$13,486	$23,841	$25,595	$14,756	$3,897	$1,991	$1,270
Decile 10	15,050	$31,397	$31,260	$26,385	$20,104	$23,973	$12,142	-$11,293	-$7,287	-$14,242
Overall	144,306	$12,204	$14,395	$7,720	$12,751	$15,719	$6,075	$547	$1,324	-$1,645

1. The conditional means are the average income and earnings for the same families in 1997 and 1998 who were in the indicated deciles of the 1997 income distribution, i.e., 1997 and 1998 incomes and earnings are ordered by the families position in the income distribution before welfare reform.
2. This is the absolute change for the same families in a given decile between 1997 and 1998.

Table 4.5 Mobility and Income Dynamics of American Families, 1997-1998

a. Number of Families (1000s)

			Income in 1998					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1997	Low-Income Families*	1	368	288	205	89	248	1,199
		2	241	992	485	239	412	2,370
		3	159	387	1,008	605	851	3,009
		4	99	215	443	975	1,447	3,179
	Higher Income Families		283	388	785	1,254	21,667	24,377
	Total		1,151	2,270	2,926	3,163	24,625	34,134

b. Percentage of Families

			Income in 1998					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1997	Low-Income Families*	1	30.7	24.1	17.1	7.5	20.70	100
		2	10.2	41.9	20.5	10.1	17.40	100
		3	5.3	12.9	33.5	20.1	28.27	100
		4	3.1	6.8	13.9	30.7	45.51	100
	Higher Income Families		1.16	1.59	3.22	5.15	88.88	100

* Lower-income families include all families with equivalent incomes below twice the official poverty line (the low-income cutoff). Group 1 of the low-income families includes families with incomes below 25 percent of the low-income cutoff. Group 2 includes families with incomes between 25 and 50 percent of the low-income cutoff. Group 3 includes families with incomes between 50 and 75 percent of the low-income cutoff. Group 4 includes all families with incomes between 75 and 100 percent of the low-income cutoff.

Note: Grayed-in boxes indicate the percentage of families who remained in the same income bracket in the following year. Numbers below the grayed boxes indicate the percentage of families who fell into, or deeper into-poverty. Percentages above the grayed-in areas indicate the percentage of that income class that moved into a higher income class in the following year.

Table 4.6 Mobility and Income Dynamics of American Families, 1996-1997

a. Number of Families (1000s)

			Income in 1997					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1996	Low-Income Families*	1	465	287	213	119	228	1,312
		2	195	1,093	551	265	358	2,462
		3	170	462	1,133	646	747	3,157
		4	121	224	511	995	1,488	3,339
	Higher Income Families		224	331	771	1,296	20,820	23,442
	Total		1,175	2,397	3,178	3,321	23,641	33,712

b. Percentage of Families

			Income in 1997					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1996	Low-Income Families*	1	35.5	21.9	16.2	9.1	17.4	100.0
		2	7.9	44.4	22.4	10.8	14.5	100.0
		3	5.4	14.6	35.9	20.5	23.7	100.0
		4	3.6	6.7	15.3	29.8	44.6	100.0
	Higher Income Families		1.0	1.4	3.3	5.5	88.8	100.0

* Lower-income families include all families with equivalent incomes below twice the official poverty line (the low-income cutoff). Group 1 of the low-income families includes families with incomes below 25 percent of the low-income cutoff. Group 2 includes families with incomes between 25 and 50 percent of the low-income cutoff. Group 3 includes families with incomes between 50 and 75 percent of the low-income cutoff. Group 4 includes all families with incomes between 75 and 100 percent of the low-income cutoff.

Note: Grayed-in boxes indicate the percentage of families who remained in the same income bracket in the following year. Numbers below the grayed boxes indicate the percentage of families who fell into, or deeper into-poverty. Percentages above the grayed-in areas indicate the percentage of that income class that moved into a higher income class in the following year.

Table 4.7 Mobility and Income Dynamics of American Families, 1993-1994

a. Number of Families (1000s)

			Income in 1994					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1993	Low-Income Families*	1	438	311	138	92	173	1,152
		2	254	842	472	185	276	2,029
		3	135	419	932	499	610	2,596
		4	71	164	458	875	1,191	2,759
	Higher Income Families		214	330	660	977	17,587	19,767
	Total		1,112	2,065	2,660	2,628	19,837	28,302

b. Percentage of Families

			Income in 1994					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1993	Low-Income Families*	1	38.0	27.0	12.0	8.0	15.0	100.0
		2	12.5	41.5	23.3	9.1	13.6	100.0
		3	5.2	16.2	35.9	19.2	23.5	100.0
		4	2.6	5.9	16.6	31.7	43.2	100.0
	Higher Income Families		1.1	1.7	3.3	4.9	89.0	100.0

* Lower-income families include all families with equivalent incomes below twice the official poverty line (the low-income cutoff). Group 1 of the low-income families includes families with incomes below 25 percent of the low-income cutoff. Group 2 includes families with incomes between 25 and 50 percent of the low-income cutoff. Group 3 includes families with incomes between 50 and 75 percent of the low-income cutoff. Group 4 includes all families with incomes between 75 and 100 percent of the low-income cutoff.

Note: Grayed-in boxes indicate the percentage of families who remained in the same income bracket in the following year. Numbers below the grayed boxes indicate the percentage of families who fell into, or deeper into-poverty. Percentages above the grayed-in areas indicate the percentage of that income class that moved into a higher income class in the following year.

Table 4.8 Mobility and Income Dynamics of American Families, 1990-1991

a. Number of Families (1000s)

			Income in 1991					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1990	Low-Income Families*	1	468	310	107	65	154	1,103
		2	267	1,201	397	202	229	2,297
		3	83	438	1,071	468	536	2,595
		4	79	215	534	877	1,091	2,796
	Higher Income Families		169	308	632	1,210	19,002	21,322
	Total		1,066	2,472	2,739	2,823	21,012	30,113

b. Percentage of Families

			Income in 1991					
			Low-Income Families*				Higher Income Families	Total
			1	2	3	4		
Income in 1990	Low-Income Families*	1	42.4	28.1	9.7	5.9	14.0	100.0
		2	11.6	52.3	17.3	8.8	10.0	100.0
		3	3.2	16.9	41.3	18.0	20.6	100.0
		4	2.8	7.7	19.1	31.4	39.0	100.0
	Higher Income Families		0.8	1.5	3.0	5.7	89.1	100.0

* Lower-income families include all families with equivalent incomes below twice the official poverty line (the low-income cutoff). Group 1 of the low-income families includes families with incomes below 25 percent of the low-income cutoff. Group 2 includes families with incomes between 25 and 50 percent of the low-income cutoff. Group 3 includes families with incomes between 50 and 75 percent of the low-income cutoff. Group 4 includes all families with incomes between 75 and 100 percent of the low-income cutoff.

Note: Grayed-in boxes indicate the percentage of families who remained in the same income bracket in the following year. Numbers below the grayed boxes indicate the percentage of families who fell into, or deeper into-poverty. Percentages above the grayed-in areas indicate the percentage of that income class that moved into a higher income class in the following year.

Appendix I

Procedures Used in Extracting CPS Data

The data we use are extracted from CPS Utilities, March Files, 1976-1999 issued by the Unicon Research Corporation, Santa Monica, California, Version 3.3.1. In some cases the variable names in the Unicon files differ from those used in the original files of the Census Bureau.

1. Definition of the Family

We define the family to include primary families and related subfamilies. Unrelated subfamilies within a household are treated as separate families except as follows:

- When the age of the head of an unrelated subfamily (or unrelated individual) living in the household is less than 17, then the unrelated subfamily (or individual) is included as a member of the primary family.
- When the age of the head of an unrelated subfamily (or unrelated individual) is above 17, but earnings are zero, the unrelated subfamily (or individual) is deleted from the sample.

2. Family Income

Where possible family income is calculated by summing up the incomes of each family member. To these totals we add values for the variables available only at the family and household level. These variables are:

- Food Stamps
- Housing Subsidies
- Energy Subsidies
- School Lunch Subsidies
- Implicit Return on Home Equity
- Property Taxes

3. Components of Family Income

Key components of family income are defined as follows:

- Other Taxes = the sum of federal, state, and property taxes.
- Means Tested Transfers from the Government = the sum of supplemental security income + public assistance and welfare + market values of noncash benefits from food stamps, housing subsidies, energy subsidies and school lunch subsidies.
- Other Transfers = Nonmeans-tested Transfers from the Government + Private Transfers.
- Payroll taxes = FICA + proportionate share of FedRet (payroll contributions to Federal retirement in lieu of FICA taxes).

4. Workers

Workers are defined as all adults age 16 and above who have positive wages or salaries.

5. Hours Worked

In general, Hours is the variable used to measure the number of hours worked per week. This variable denotes the number of hours worked in the week preceding the March survey. In the following cases the Hours variable is not used.

- If Hours is missing or < 5, it is replaced by "Hrslyr" (usual hours worked per week last year).
- When Hours is above 80, we top coded hours worked at 80.

6. Wage Rate

The procedure for determining the hourly wage is as follows:

- If an hourly wage is reported, we use the amount given by the variable Ernhr.
- When the Ernhr of a worker is missing or zero, then we calculate the value by dividing the variable Wklywg (average weekly earnings) by Hours (hours worked last week).
- When the calculated wage is less than $2 in 1997 dollars, the worker is treated as if he or she is self-employed and is not included among the wage and salary workers analyzed in this report. Any income he or she generates is treated as if it were self-employment income.

7. The Two-Year CPS Panels

To create the two-year CPS panels for 1990-1991, 1993-1994, 1996-1997 and 1997-1998 we match families in successive CPS files using the following procedure:

- The first step in matching year t with year t+1 involves selecting from year t those housing units with a month in sample (variable name MIS) value of 1 through 4 and from year t+1 those units with MIS values of 5 through 8.
- We then match households, using three variables -- MIS, Household ID, and State.
- To match the individuals within hoseholds, we use the age and sex variables. When MIS, HHID, STATE, SEX and AGE (lagged one year) are the same for both years, individuals are then treated as "matched."
- We next calculate the matching percentage within a family. A 100 percent match of individuals within a family in year t and t+1 is a perfect match. A zero matching percentage is a perfect nonmatch. All families with a zero matching percentages are deleted from the sample.
- For families for which there is neither a perfect match (100%) nor a perfect nonmatch (0%), a partial matching of individuals exists.
- For partially matched families we then focus on the adults within the family. If we are able match all adults, the family is considered as matched and we include it in the sample. To accomplish this final step in the matching process we proceed as follows:
  - We count the number of adults (age 16 and older). If the number of adults is not the same both years, the family is deleted from the sample.
  - Next, we select the nonmatched adults of the remaining partially matched families and compare the ages of the adults in the two years. If the age difference for two adults (e.g., the head, spouse, adult children) is 5 or greater the family is deleted from the sample. If the age difference is less than 5, the adult individual is considered as matched and the family is included in the sample..
  - Finally, we calculate the matching percentage of partial matching families and selected sample with 100% matching.
- In summary, to be included in the panel a family must satisfy one of the following matching conditions:
  - Have the same MIS, HHID, STATE, and have a 100 percent matching of individuals within a family,
  - Have the same MIS, HHID, STATE, and have the same number of adults in the family in both years, or
  - Have the same MIS, HHID, STATE and the difference in age for the nonmatching adult must be less than 5 in both years.

Appendix 2

Orshansky Equivalence Scales*

		Number of Children								
		None		1	2	3	4	5	6	7
		Head Age is less than 65	Head Age is 65 and over							
Family Sizes	1	1.00	0.92	-	-	-	-	-	-	-
	2	1.29	1.16	1.32	-	-	-	-	-	-
	3	1.50		1.55	1.55	-	-	-	-	-
	4	1.98		2.02	1.95	1.96	-	-	-	-
	5	2.39		2.43	2.35	2.29	2.26	-	-	-
	6	2.75		2.76	2.70	2.65	2.57	2.52	-	-
	7	3.16		3.18	3.16	3.07	2.98	2.88	2.76	-
	8	3.54		3.57	3.51	3.45	3.37	3.27	3.16	3.14

* The scales are normalized to a single adult less than 65 years of age.

Appendix 3

Table A.1

First-Order Marginal Dominance Comparisons of the Impact of Earnings on Low-Income Families
(Adult Equivalent[1] Comprehensive Incomes in 1997 Dollars, Using Orshansky Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	Family Earnings			Low-Wage Earnings			Minimum Wage Earnings		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$846 (41)	$833 (29)	$756 (29)	$453 (29)	$376 (23)	$452 (24)	$123 (15)	$98 (11)	$129 (13)
2	50% to 75%	$1,936 (62)	$1,807 (54)	$1,848 (52)	$464 (48)	$845 (42)	$991 (42)	$280 (28)	$241 (23)	$311 (25)
3	75% to 100%	$3,174 (66)	$3,306 (61)	$3,679 (60)	$1,311 (50)	$1,356 (480)	$1,842 (51)	$451 (30)	$466 (30)	$625 (33)
4	100% to 125%	$5,015 (79)	$5,727 (73)	$6,080 (73)	$1,660 (57)	$1,604 (54)	$2,348 (63)	$661 (38)	$561 (33)	$910 (43)
5	125% to 150%	$7,846 (92)	$8,316 (84)	$8,766 (81)	$1,734 (63)	$1,299 (49)	$2,046 (61)	$571 (38)	$445 (29)	$695 (37)
6	150% to 175%	$10,605 (104)	$10,656 (99)	$10,545 (103)	$1,896 (62)	$1,220 (49)	$1,728 (64)	$625 (39)	$934 (28)	$593 (38)
7	175% to 200%	$12,794 (118)	$9,812 (152)	$7,744 (162)	$1,558 (64)	$1,245 (64)	$1,441 (77)	$569 (37)	$407 (37)	$513 (46)

Standard errors are in ( ).

1. Family Comprehensive Incomes are adjusted for size and composition using Orshansky equivalence scales.

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.

Table A.2 First-Order Marginal Dominance Comparison of the Impact of the EITC, Payroll and Income Taxes on Low-Income Families (Adult Equivalent[1] Cash Incomes in 1997 Dollars, Using Orshansky Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	EITC			Payroll Taxes[3]			Income Taxes		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$65 (4)	$139 (7)	$141 (4)	$87 (4)	$72 (3)	$65 (3)	$3 (1)	$3 (1)	$4 (2)
2	50% to 75%	$156 (6)	$327 (12)	$394 (13)	$173 (6)	$151 (5)	$164 (5)	$13 (2)	$16 (3)	$3 (1)
3	75% to 100%	$228 (6)	$539 (13)	$627 (13)	$271 (6)	$272 (6)	$316 (6)	$33 (2)	$45 (4)	$58 (3)
4	100% to 125%	$248 (6)	$616 (12)	$660 (12)	$410 (8)	$470 (7)	$490 (7)	$100 (4)	$129 (5)	$159 (5)
5	125% to 150%	$250 (6)	$510 (11)	$523 (11)	$645 (9)	$670 (9)	$706 (8)	$270 (7)	$316 (7)	$387 (18)
6	150% to 175%	$180 (5)	$334 (9)	$345 (10)	$856 (11)	$818 (9)	$804 (9)	$553 (10)	$614 (10)	$606 (10)
7	175% to 200%	$122 (4)	$333 (12)	$370 (15)	$1,002 (12)	$722 (13)	$554 (13)	$844 (13)	$520 (12)	$406 (12)

Standard errors are in ( ).

1. Family Comprehensive Incomes are adjusted for size and composition using Orshansky equivalence scales.
2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.
3. Payroll taxes include only the "employee's share" of the tax.

Table A.3

First-Order Marginal Dominance Comparisons of the Impact of Earnings on Low-Income Families
(Adult Equivalent[1] Cash Incomes in 1997 Dollars, Using NRC Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	Family Earnings			Low-Wage Earnings			Minimum Wage Earnings		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$943 (26)	$1,153 (25)	$1,200 (26)	$483 (19)	$575 (20)	$710 (22)	$144 (11)	$195 (13)	$237 (14)
2	50% to 75%	$2,628 (49)	$2,999 (46)	$3,074 (44)	$1,022 (37)	$1,120 (38)	$1,464 (39)	$400 (25)	$361 (22)	$522 (26)
3	75% to 100%	$4,080 (57)	$4,229 (54)	$4,540 (54)	$1,201 (40)	$995 (35)	$1,550 (44)	$412 (24)	$355 (22)	$553 (28)
4	100% to 125%	$5,809 (68)	$6,144 (67)	$6,131 (66)	$1,365 (46)	$1,083 (40)	$1,494 (46)	$490 (25)	$405 (25)	$541 (29)
5	125% to 150%	$7,775 (80)	$8,222 (76)	$8,593 (76)	$1,245 (54)	$1,104 (44)	$1,481 (53)	$535 (31)	$316 (24)	$520 (32)
6	150% to 175%	$10,106 (90)	$9,936 (113)	$8,519 (153)	$1,264 (52)	$967 (62)	$1,667 (106)	$414 (29)	$327 (36)	$475 (59)
7	175% to 200%	$11,682 (130)	$9,778 (229)	$11,438 (215)	$1,272 (77)	$915 (108)	$1,995 (167)	$432 (46)	$288 (62)	$573 (95)

Standard errors are in ( ).

1. Family Cash Incomes are adjusted for size and composition using NRC equivalence scales (a=0.75; b=0.75).

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.

Table A.4 First-Order Marginal Dominance Comparison of the Impact of the EITC, Payroll and Income Taxes on Low-Income Families (Adult Equivalent[1] Cash Incomes in 1997 Dollars, Using NRC Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	EITC			Payroll Taxes[3]			Income Taxes		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$93 (3)	$286 (7)	$341 (8)	$83 (2)	$93 (2)	$102 (2)	$3 (1)	$4 (1)	$3 (0)
2	50% to 75%	$217 (5)	$545 (11)	$601 (11)	$217 (5)	$243 (4)	$251 (4)	$18 (1)	$24 (1)	$24 (1)
3	75% to 100%	$213 (4)	$462 (9)	$488 (9)	$327 (5)	$334 (5)	$356 (5)	$54 (2)	$63 (2)	$84 (2)
4	100% to 125%	$170 (4)	$318 (7)	$311 (7)	$464 (6)	$481 (6)	$479 (6)	$162 (4)	$199 (4)	$237 (4)
5	125% to 150%	$113 (4)	$188 (6)	$178 (6)	$613 (8)	$663 (7)	$667 (7)	$365 (6)	$465 (7)	$530 (7)
6	150% to 175%	$77 (3)	$157 (8)	$128 (8)	$798 (9)	$788 (11)	$676 (14)	$662 (8)	$772 (11)	$661 (3)
7	175% to 200%	$55 (4)	$36 (5)	$5 (2)	$931 (13)	$769 (20)	$909 (20)	$935 (13)	$946 (25)	$1,136 (25)

Standard errors are in ( ).

1. Family Cash Incomes are adjusted for size and composition using NRC equivalence scales (a=0.75; b=0.75).
2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.
3. Payroll taxes include only the "employee's share" of the tax.

Table A.5

First-Order Marginal Dominance Comparisons of the Impact of Earnings on Low-Income Families
(Adult Equivalent[1] Comprehensive Incomes in 1997 Dollars, Using NRC Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	Family Earnings			Low-Wage Earnings			Minimum Wage Earnings		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$919	$874	$788	$458	$403	$436	$129	$109	$129
		(34)	(27)	(25)	(23)	(20)	(20)	(12)	(10)	(11)
2	50% to 75%	$2,179	$2,225	$2,452	$953	$926	$1,211	$327	$294	$430
		(49)	(45)	(45)	(37)	(35)	(36)	(23)	(20)	(24)
3	75% to 100%	$3,955	$4,342	$4,693	$1,181	$1,120	$1,694	$414	$415	$584
		(58)	(53)	(52)	(39)	(36)	(42)	(24)	(23)	(27)
4	100% to 125%	$6,650	$6,691	$7,088	$1,362	$1,155	$1,641	$537	$390	$613
		(68)	(62)	(61)	(44)	(37)	(45)	(29)	(22)	(29)
5	125% to 150%	$9,015	$8,071	$7,622	$1,350	$1,001	$1,405	$492	$322	$464
		(79)	(97)	(89)	(47)	(41)	(54)	(28)	(24)	(31)
6	150% to 175%	$9,476	$7,068	$6,280	$11,178	$844	$1,155	$414	$270	$354
		(108)	(138)	(155)	(50)	(58)	(83)	(31)	(32)	(45)
7	175% to 200%	$8,124	$4,240	$3,350	$1,039	$690	$861	$313	$210	$264
		(171)	(192)	(223)	(77)	(77)	(109)	(42)	(41)	(62)

Standard errors are in ( ).

1. Family Comprehensive Incomes are adjusted for size and composition using NRC equivalence scales (a=0.75; b=0.75).

2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.

Table A.6 First-Order Marginal Dominance Comparison of the Impact of the EITC, Payroll and Income Taxes on Low-Income Families (Adult Equivalent[1] Comprehensive Incomes in 1997 Dollars, Using NRC Equivalence Scales)

Income Class[2]	Fraction of Poverty Line	EITC			Payroll Taxes[3]			Income Taxes		
		1990	1995	1997	1990	1995	1997	1990	1995	1997
	1	2	3	4	5	6	7	8	9	10
1	Below 50%	$79	$167	$175	$88	$73	$70	$4	$6	$4
		(3)	(7)	(7)	(300)	(200)	(20)	(1)	(1)	(1)
2	50% to 75%	$174	$395	$473	$188	$185	$213	$18	$23	$29
		(50)	(10)	(10)	(5)	(4)	(5)	(1)	(2)	(2)
3	75% to 100%	$204	$488	$516	$327	$355	$384	$65	$76	$103
		(4)	(8)	(9)	(6)	(5)	(5)	(2)	(3)	(3)
4	100% to 125%	$167	$335	$349	$541	$555	$560	$247	$301	$330
		(4)	(7)	(7)	(7)	(6)	(6)	(5)	(50)	(5)
5	125% to 150%	$106	$249	$268	$718	$606	$563	$523	$466	$468
		(3)	(7)	(8)	(8)	(7)	(8)	(8)	(7)	(8)
6	150% to 175%	$94	$242	$192	$715	$531	$476	$626	$481	$431
		(4)	(10)	(10)	(10)	(11)	(13)	(10)	(14)	(8)
7	175% to 200%	$70	$173	$95	$618	$323	$261	$649	$257	$228
		(4)	(14)	(12)	(14)	(16)	(19)	(18)	(16)	(18)

Standard errors are in ( ).

1. Family Comprehensive Incomes are adjusted for size and composition using NRC equivalence scales (a=0.75; b=0.75).
2. Boundaries between income classes are determined as fractions of the official poverty lines. They could equivalently be expressed as fraction of the low-income cutoff.
3. Payroll taxes include only the "employee's share" of the tax.

Figure 1 EITC and First-Order (Poverty Gap) Dominance at Alternative Poverty Lines, 1997

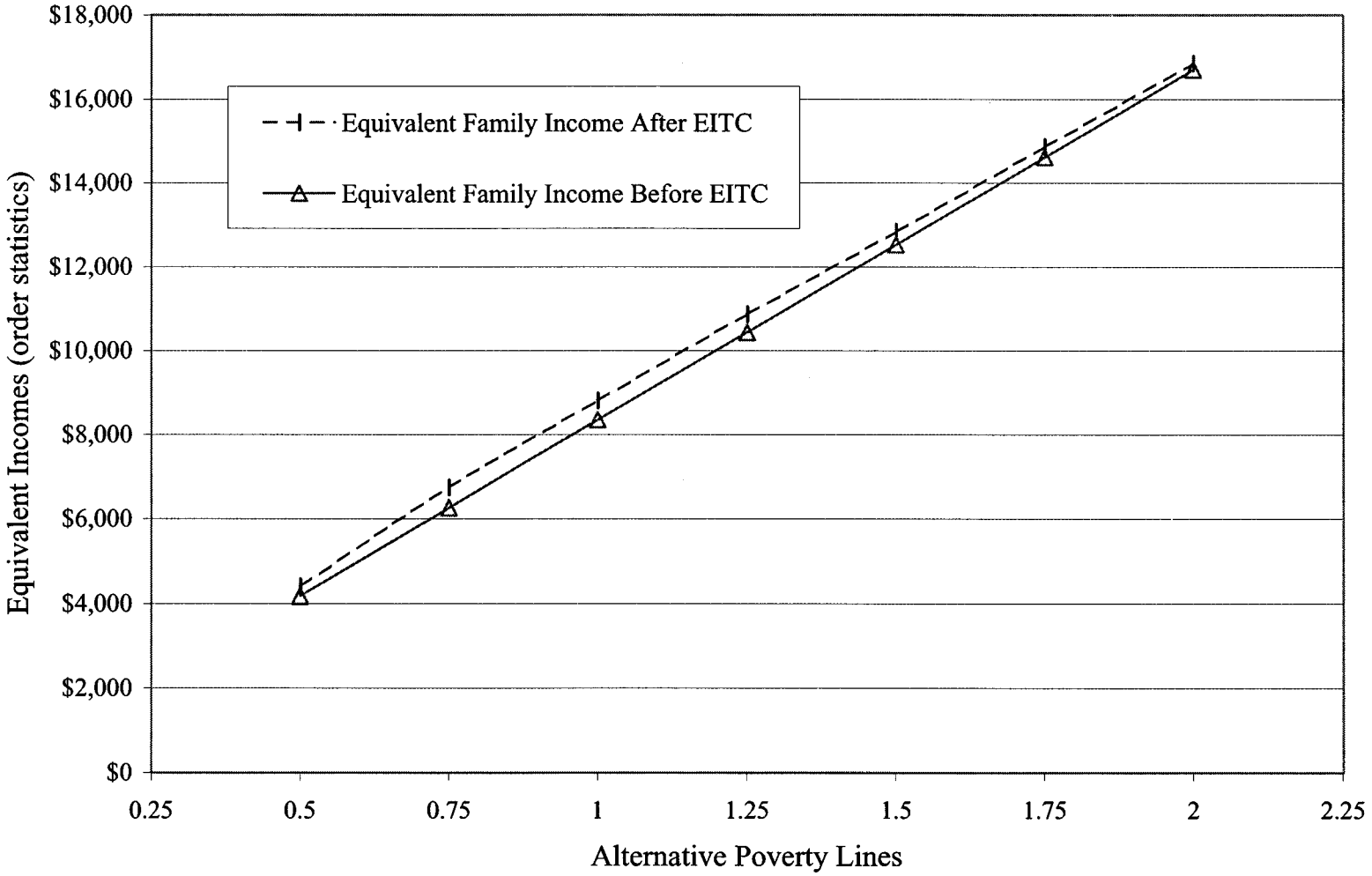


Figure 2 First-Order Marginal Dominance at Alternative Poverty Lines, 1997

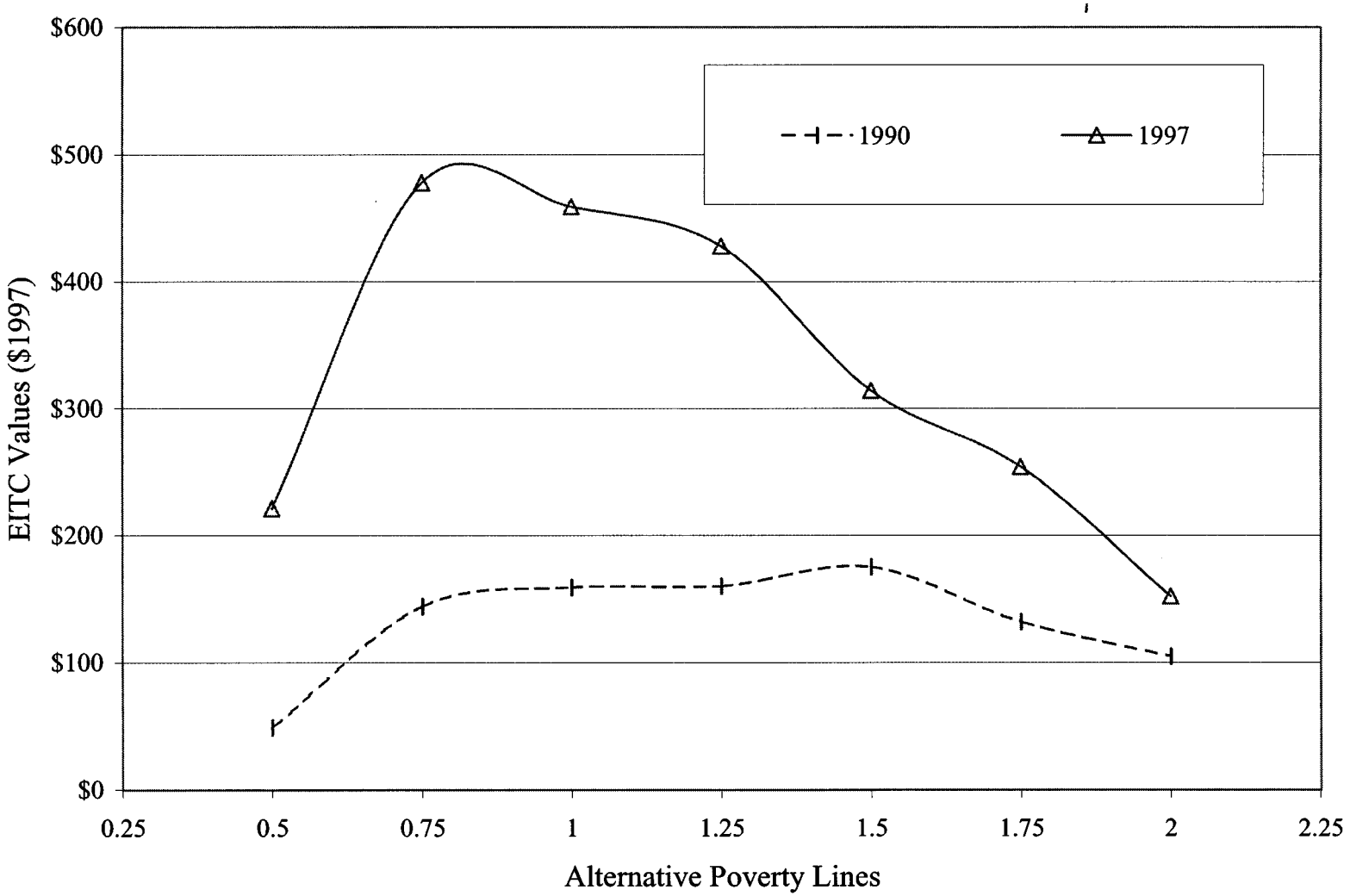


Figure 3 EITC and Second-Order (Poverty Gap) Dominance at Alternative Poverty Lines, 1997

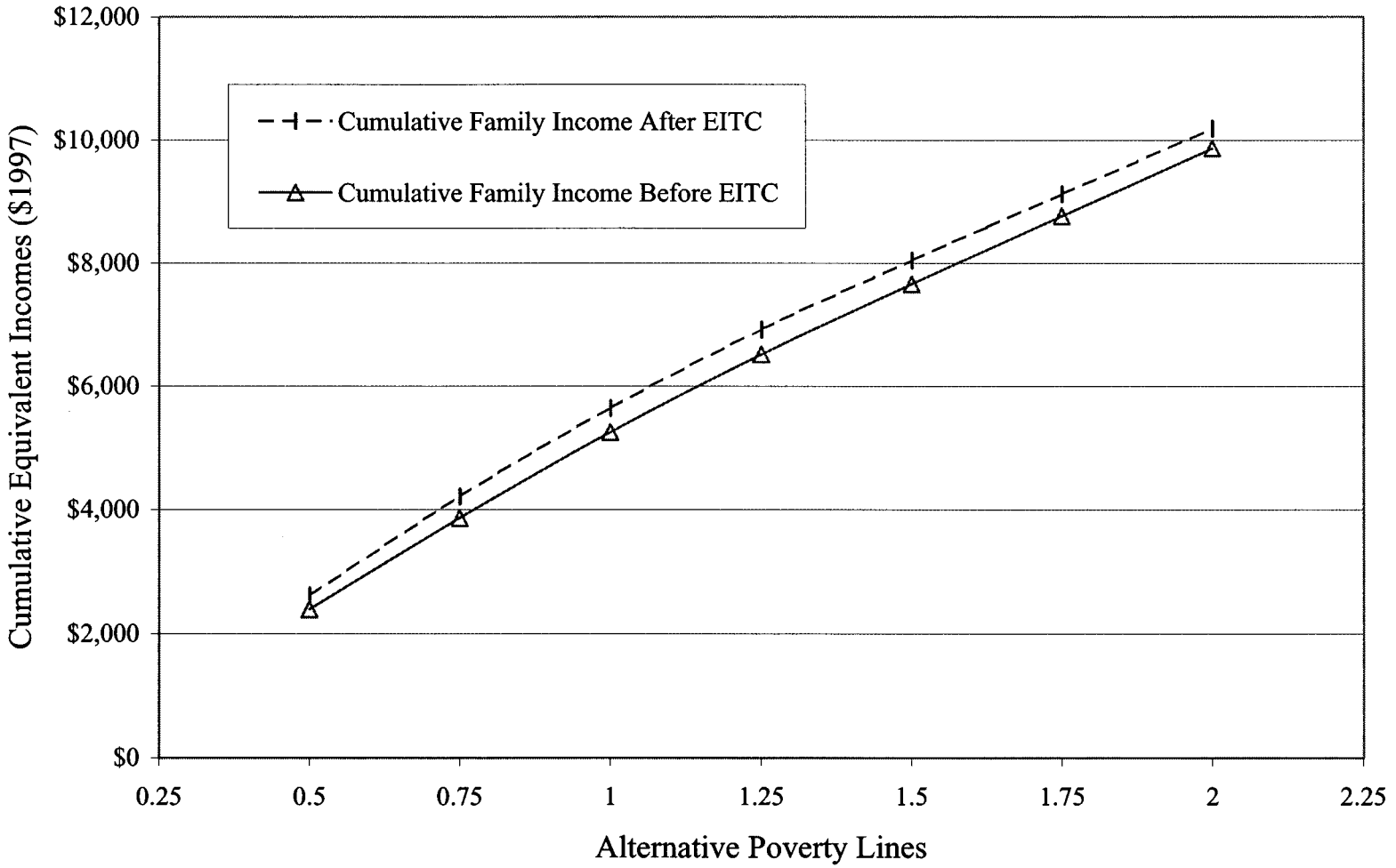
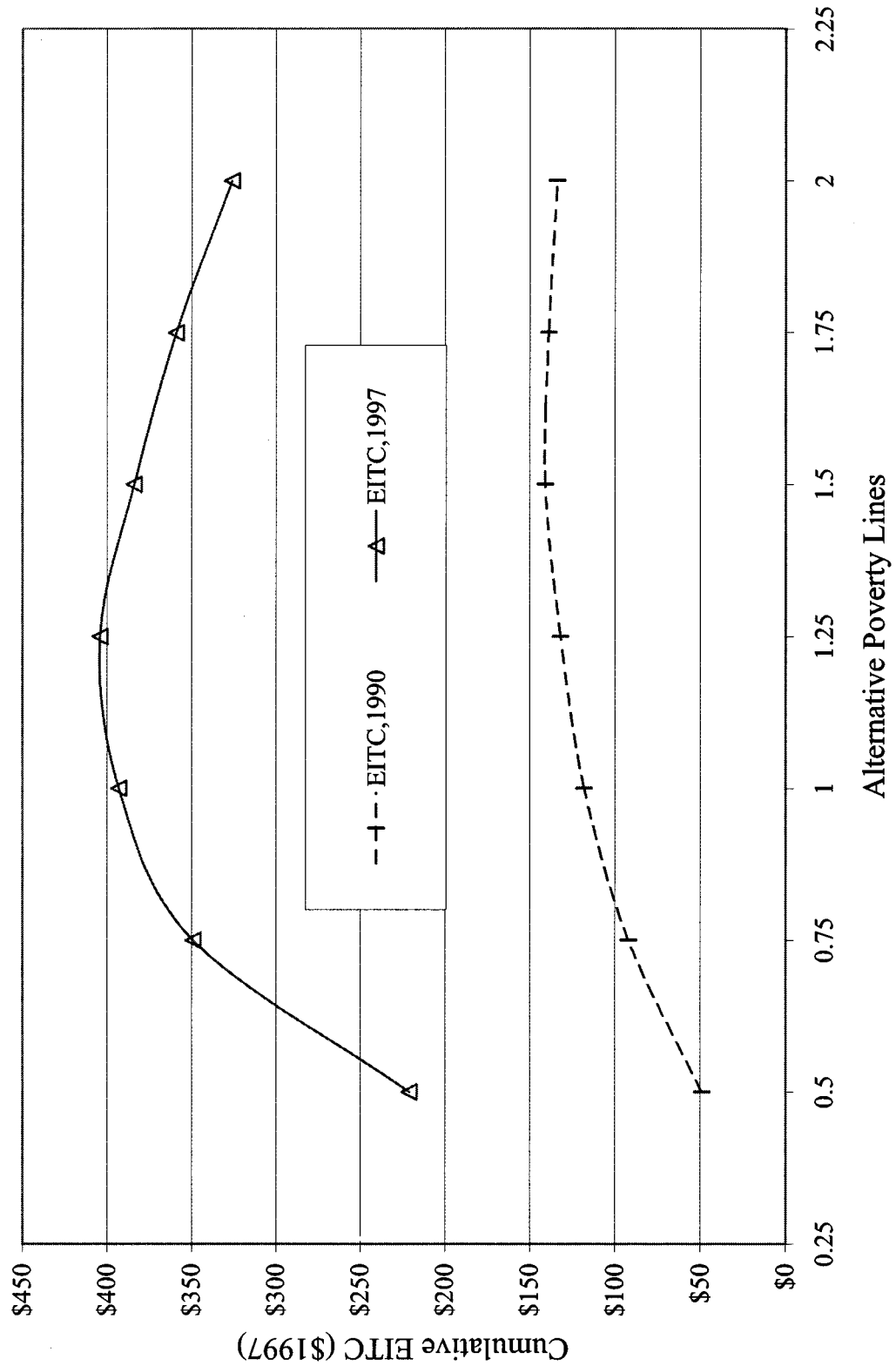


Figure 4

Second-Order Marginal Dominace at Alternative Poverty Lines, 1997



References

Atkinson, Anthony. "On the Measurement of Inequality," *Journal of Economic Theory*, 2, 244-263. 1970.

Bishop, John A., K. Victor Chow, John P. Formby and Buhong Zheng. "Income and Tax Changes Following the Tax Reform Act of 1986: A General Decomposition." In Sourushe Zandvakili (ed.), *Research on Economic Inequality.* Volume 7, JAI Press: Greenwich, CT. 1997.

Bishop, John A. and John P. Formby. "Dominance Evaluation of Income Distribution," in J.H. Berstrand et al (eds.), *The Changing Distribution of Income in an Open Economy*, North Holland, Amsterdam. 1994.

Bishop, John A., John P. Formby and Paul D.Thistle "Convergence of the South and Non-South Income Distributions," *American Economic Review*, 82, 262-272. 1992.

Bishop, John A., John P. Formby and Lester A. Zeager. "The Impact of Food Stamps on US Poverty in the 1980s: A Marginal Dominance Approach." *Economica*. 63, S141-S162. 1996.

Bishop, John A., John P. Formby and Buhong Zheng. "Distribution Sensitive Measures of Poverty in the United States." *Review of Social Economy.* September, 57, 307-343. 1999.

Card, David and Alan B. Kruger. "Myth and Measurement: The New Economics of the Minimum Wage." Princeton University Press: Princeton. 1995.

Citro, Constance F. and Robert T. Michael (eds.). "Measuring Poverty: A New Approach." *National Research Council* and National Academy Press: Washington, D.C. 1995.

Foster, James, J. Greer, and E. Thorbecke. "A Class of Decomposable Poverty Measures," *Econometrica.* May, 52: 761 -766. 1984.

Foster, James and A.F. Shorrocks. Poverty Orderings. *Econometrica*. 56, 173-177. 1988.

Gramlich, E.M., Kasten R., Sammartino F. "Growing Inequality in the 1980s: The Role of Federal Taxes and Cash Transfers." In S. Danziger and P. Gottschalk, eds., *Uneven Tides: Rising Inequality in America.*: Russell Sage Foundation: New York. 1993

Orshansky, Mollie. "Counting the Poor: Another Look at the Poverty Profile." *Social Security Bulletin.* January, 28: 387-406. 1965a.

Orshansky, Mollie. "Who's Who among the Poor? A Demographic View of Poverty." *Social Security Bulletin.* July, 28: 3-32. 1965b.

Pechman, Joesph. "Who Paid the Taxes, 1966-1985." The Brookings Institution: Washington D.C. 1993.

Radner, Daniel. "Noncash Income, Equivalence Scales and the Measurement of Economic Well-Being." *Review of Income and Wealth.* March, 43: 71-88. 1997.

Ravallion, Martin. "Poverty Comparisons." Harwood Academic Publishers: New York. 1993.

Sawhill, Isabel. "Poverty in the U.S.: Why Is It So Persistent?" *Journal of Economic Literature.* September, 26: 219-231. 1998.

Sen, Amartya. "Poverty: An Ordinal Approach to Measurement." *Econometrica.* 44, 219-231. 1976.

Endnotes

1. A prominent example of the minimum wage literature is Card and Kruger's, *Myth and Measurement,* (1995). In Chapter 9, they discuss the impact of the minimum wage on poverty, finding it "small…[and] relatively imprecise" (p.308). While they consider one alternative to the official poverty line, there is no discussion of income concepts or equivalence scales.

2. In contrast to the minimum wage literature, the poverty literature considers many measurement issues still open to debate as is made clear in the National Research Council's 1995 survey.

3. Orshansky is credited with originating the official methodology used to measure poverty in the U.S.

4. While the theoretical foundations of third and higher orders of dominance have been established, researchers are only beginning to explore the use of third-order dominance in empirical research.

5. Following Ravallion (1993), the CDFs in Figure 1 can also be referred to as "poverty incidence curves."

6. More specifically, sub-minimum wage workers include those with wages ≤ 90% of the federal minimum wage, and minimum wage workers have wages > 90% and ≤ 110% of the federal minimum. Near-minimum wage workers have hourly wages > 110% and ≤ 125% of the federal minimum wage.

7. There are several alternative CPS measures of wages. We follow the usual procedure and use the "hourly wage last week" when it is reported. For workers for whom an hourly wage is not reported we calculate the average hourly wage by dividing earnings last week by reported hours worked.

8. This surprising result led us to investigate the factors that predict whether a worker will be employed and paid a sub-minimum wage. The probabilities of being in the sub-minimum wage category are estimated using probit and logit analysis. The results are consistent across specifications and indicate that the factors associated with extremely high probabilities (above 0.5) of being a sub-minimum wage worker include those that would be expected. Significant factors include combinations of the following: Teenagers or young adults, Females, Hispanics, less than 12 years of schooling, service and farm worker occupations, and part-time work.

9. Hours rose slightly (approximately one percent) for low-wage workers in low-income families above 25 percent of the low-income cutoff and fell (by more than five percent) for low-wage workers in families below 25 percent of the cutoff.

10. Note that Table 1.6 shows the average contributions of sub-minimum, minimum and near-minimum wage workers to all poor families for different poverty lines. Therefore, the sum of the contributions in columns 1, 2 and 3 is equal to the total contribution in column 4. It should also be noted that Table 1.6 does not show mean earnings. Instead, it shows the mean contribution to the family income, which is defined over *all* poor families, not just poor families with positive earnings. As noted above, many poor families have zero earnings from low-wage work.

11. Small labor supply elasticities suggest a tax incidence in which workers also bear a substantial part of the burden of the employer contribution to payroll taxes. In practice some of the payroll tax burden associated with the employers' share is probably shifted to workers. In his classic study, "Who Paid the Taxes, 1966-1985," Pechman (1993) makes two assumptions about the payroll tax. First, he assumes the employers' share is shifted forward to consumers in the form of higher prices. Second, he assumes it is shifted backward to workers in the form of lower wages. We assume workers bear none of the burden.

12. Appendix 3 provides tables that repeat this analysis using comprehensive income and both equivalence scales. The Orshansky scales are described in the Appendix. The NRC scale is (A + PK)F, where A is number of adults, K is number of children, and P and F are set to 0.75 to capture the lower cost of children and the economies of scale of living in families.

13. Due to periodic changes in procedures used for processing and compiling CPS data it is not possible to match families and create panels across every two-year period. For example, CPS years 1995 and 1996 (calendar years 1994 and 1995) cannot be matched.

14. The sampling frame for the CPS is the housing unit. From one year to the next, some families move and for those that remain in the same house the size and composition can change. We restrict our panels to samples of families that can be matched in terms of age and sex of each family member and other variables. Appendix 1 provides details concerning the matching procedure.

15. If the order of families in the income distribution did not change from year 1 to year 2 the quantile function in year 2 would be equivalent to the income concentration function and we would obtain identical results when we analyzed anonymous families and the same families.

16. This figure is calculated from Table 4.8 by adding the higher income families rows 1-4 and dividing by the sum of the total column for the same rows.

Recent Publications

The Long-Term Effects of Youth Unemployment, by Dr. Thomas A. Mroz and Dr. Timothy H. Savage, University of North Carolina, Chapel Hill and Welch Consulting Economists, October 2001.

National Good Times, Local Bad Times: The Local Area Unemployment Crisis, by Employment Policies Institute, August 2001.

Who Would Benefit from a $6.65 Minimum Wage? A State-by-State Profile: 2001 Edition, by Employment Policies Institute, July 2001.

The Case for a Targeted Living Wage Subsidy, by Employment Policies Institute, June 2001.

The Effect of Minimum Wages on the Labor Force Participation Rates of Teenagers, by Walter J. Wessels, North Carolina State University, June 2001.

Winners and Losers of Federal and State Minimum Wages, by Thomas MaCurdy and Frank McIntyre, Stanford University, June 2001.

Does the Minimum Wage Reduce Poverty? by Richard K. Vedder and Lowell E. Gallaway, Ohio University, June 2001.

State Flexibility: The Minimum Wage and Welfare Reform, by Employment Policies Institute, March 2001.

Evaluating the Effects of Medicaid on Welfare and Work: Evidence from the Past Decade, by Aaron S. Yelowitz, University of California at Los Angeles, December 2000.

Higher Minimum Wages Harm Minority and Inner-City Teens, by Mark Turner and Berna Demiralp, Johns Hopkins University, September 2000.

The Living Wage: Survey of Labor Economists, by The Survey Center, University of New Hampshire, August 2000.

The Relative Compensation of Part-Time and Full-Time Workers, by Barry Hirsch, Trinity University, April 2000.

Living Wage Policy the Basics, by Employment Policies Institute, March 2000.

Rising Above the Minimum Wage, by William Even, Miami University of Ohio, and David Macpherson, Florida State University, January 2000.

Economic Analysis of a Living Wage Ordinance, by George Tolley, University of Chicago, Peter Bernstein, DePaul University, and Michael Lesage, RCF Economic & Financial Consulting, July 1999.

The Employment Impact of a Comprehensive Living Wage Law: Evidence from California, by Employment Policies Institute, July 1999.

Effective Marginal Tax Rates on Low-Income Households, by Daniel N. Shaviro, New York University School of Law, February 1999.

An Analysis of the Baltimore Living Wage Study, by Employment Policies Institute, October 1998.

Targeted Jobs Tax Credits and Labor Market Experience, by Frederick J. Tannery, University of Pittsburgh, June 1998.

Job Loss in a Booming Economy, 2nd Edition, by Employment Policies Institute, May 1998.

Work Ethic and Family Background, by Casey B. Mulligan, University of Chicago, May 1997.

The Minimum Wage Debate: Questions and Answers, Third Edition, by Employment Policies Institute, May 1997.

From Welfare to Work: The Transition of an Illiterate Population, by Employment Policies Institute, February 1997.

Who Are The "Low-Wage" Workers? by Derek Neal, University of Chicago, July 1996.

The Impact of the Federal Unemployment Insurance Tax Ceiling, by Daniel S. Hamermesh and David Scoones, University of Texas at Austin, October 1995.

The Effects of Minimum Wages on Teenage Employment, Enrollment and Idleness, by David Neumark, Michigan State University, April 1995.

Jobs Taken by Mothers Moving from Welfare to Work: And the Effects of Minimum Wages on this Transition, by Peter D. Brandon, Institute for Research on Poverty, University of Wisconsin—Madison, February 1995.

Minimum Wage Laws and the Distribution of Employment, by Kevin Lang, Boston University, January 1995.

The Effects of High School Work Experience on Future Economic Attainment, by Christopher J. Ruhm, University of North Carolina at Greensboro, May 1994.

Public Policies for the Working Poor: The Earned Income Tax Credit vs. Minimum Wage Legislation, by Richard V. Burkhauser, Syracuse University, and Andrew J. Glenn, Vanderbilt University, March 1994.

EMPLOYMENT POLICIES INSTITUTE

Suite 1200 | 1775 Pennsylvania Ave.,NW
Washington D.C. 20006 | Tel 202.463.7650
Fax 202.463.7107 | www.EPIonline.org