WELFARE, THE EARNED INCOME TAX CREDIT, AND THE LABOR SUPPLY OF SINGLE MOTHERS*

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During 1984–1996, welfare and tax policy were changed to encourage work by single mothers. The Earned Income Tax Credit was expanded, welfare benefits were cut, welfare time limits were added, and welfare cases were terminated. Medicaid for the working poor was expanded, as were training programs and child care. During this same time period there were unprecedented increases in the employment and hours of single mothers. We show that a large share of the increase in work by single mothers can be attributed to the EITC and other tax changes, with smaller shares for welfare benefit cuts, welfare waivers, training programs and child care programs.

I. INTRODUCTION

Between 1984 and 1996, changes in tax and transfer programs sharply increased the incentive for single mothers to work. During this same period, single mothers began to work more as their weekly employment increased by about six percentage points and their annual employment increased by nearly nine percentage points. Other groups, such as single women without children, married mothers, and black men, did not experience similar gains in employment over this period (see Meyer and Rosenbaum [2000a]). These facts lead us to examine whether the changes in tax and transfer programs were responsible for single mothers working more and what changes were the most important.

* We thank Joseph Altonji, Timothy Bartik, Rebecca Blank, Janet Currie, Steven Davis, Jeffrey Liebman, Thomas MaCurdy, Leslie Moscow, Derek Neal, Julie Rosenbaum, Christopher Ruhm, John Karl Scholz, seminar participants at the Association for Public Policy Analysis and Management Annual Meetings, University of California at San Diego, the Federal Reserve Board, the Institute for Research on Poverty, the Manpower Demonstration Research Corporation, the University of Maryland, the National Association for Welfare Research and Statistics Annual Meetings, the National Bureau of Economic Research, the National Tax Association annual meetings, Northwestern University, Syracuse University, Texas A & M University, the Urban Institute, and the University of Wisconsin and many others for comments. We have been greatly aided by help with data and program details by Daniel Feenberg, Linda Giannarelli, Laura Guy, Phillip Levine, Robert McIntire, Steve Savner, Jill Schield, and Aaron Yelowitz. Brian Jenn and Christopher Jepsen provided excellent research assistance. This research has been partly supported by the Northwestern University/University of Chicago Joint Poverty Center, the Household International, Inc. Chair in Economics and the National Science Foundation (Meyer), and a Research Training Fellowship in Urban Poverty funded by the National Science Foundation and Northwestern University (Rosenbaum).

The Quarterly Journal of Economics, August 2001

The largest change in the work incentives of single mothers between 1984 and 1996 was a tenfold increase in credits through the Earned Income Tax Credit (EITC). Only working families (primarily those with children) receive the EITC, so its expansion increased the incentive for single mothers to work. We analyze not only the federal EITC, but other federal income tax changes, state income taxes, and state EITCs, as well. The Medicaid program also greatly expanded during this period. Between 1984 and 1994 the number of children receiving health coverage through Medicaid increased 77 percent, while the number of covered adults with dependent children increased 35 percent. The expansions increased coverage for nonwelfare families with incomes near the poverty line, thus making work more attractive for low-income single mothers. Cash assistance to single parents through Aid to Families with Dependent Children (AFDC) also changed quite dramatically over this period. Nearly every state experimented with changes, often under federal waivers of the existing AFDC rules. These changes typically imposed work requirements, time limits, or other measures to encourage single mothers to work. We also investigate the effects of other changes to the AFDC and Food Stamp programs, including changes in benefit levels, earnings disregards, and benefit reduction rates. Finally, we examine the effects of changes in child care and training programs during this period.

Our main research strategy identifies the effects of these policies on single mothers' labor supply through the differential treatment of single mothers and single women without children under welfare and tax laws. However, the richness of these policy changes allows us to consider additional specifications that focus on narrower sources of variation, including differences among single mothers in their numbers and ages of children, and differences across states in their taxes, benefits, and living costs. These sources of variation are likely to be unrelated to underlying differences across individuals in their desire to work, and thus are likely to be exogenous to labor supply decisions. We also develop a new methodology for summarizing the key features of the complex, nonlinear budget sets created by policies such as the EITC, Medicaid, and AFDC.

Understanding the relationship between the changes in government policies and the increases in the labor supply of single mothers during this period is important for several reasons. First, these changes in policies provide a plausible source of exogenous

variation with which to identify the effects of tax and welfare parameters on labor supply. The magnitudes of these effects are key determinants of the gains or losses from changes in income redistribution and social insurance policies.

Second, understanding the effects of government policies during the 1984–1996 period has taken on more importance due to the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). In 1997, PRWORA replaced the main cash assistance program for single mothers, AFDC, with Temporary Assistance for Needy Families (TANF). The increased state discretion under the new law combined with political changes has led to welfare reform which discourages welfare receipt and often diverts potential welfare recipients from traditional programs. These reforms are difficult if not impossible to characterize using a few variables. It is likely that many of the policies examined in this paper will be harder and more problematic to analyze using post-PRWORA data.[1]

Third, there is surprisingly little previous work that estimates the effects of the EITC, Medicaid, or welfare changes on whether single mothers work. The only paper that directly examines how the EITC affects single mothers' labor supply is Eissa and Liebman [1996], which examines the effect of the Tax Reform Act of 1986.[2] In his discussion of the labor supply effects of Medicaid, Moffitt [1992] argues that there has been too little work to draw reliable conclusions.[3] Moffitt describes the labor supply effect of AFDC as being subject to considerable uncertainty and notes that the broader labor supply literature has examined single mothers "only rarely."[4] Dickert, Houser, and Scholz [1995] argue that this literature provides little guidance as to how the EITC will affect labor market participation, and that this omission is especially important because past work suggests that most

1. See Ellwood [2000], National Research Council [1999], and Jencks and Swingle [2000] for related arguments.

2. Several papers use labor supply parameters estimated from the negative income tax experiments and other sources to simulate the effects of the EITC including Hoffman and Seidman [1990], Holtzblatt, McCubbin, and Gillette [1994], Browning [1995], and Dickert, Houser, and Scholz [1995]. Dickert, Houser, and Scholz estimate the effect of the after-tax wage and welfare programs on participation using a cross section of data from the 1990 panel of the Survey of Income and Program Participation (SIPP). They then apply these results to simulate the effects of the EITC on participation. Eissa and Hoynes [1998] examine the effects of the EITC on the labor supply of married couples.

3. See Blank [1989], Winkler [1991], and Moffitt and Wolfe [1992], in particular. The more recent work of Yelowitz [1995] examines the 1988 to 1991 period.

4. See Danziger, Haveman, and Plotnick [1981], and Moffitt [1992].

of the labor supply response is in the work decision rather than the hours decision. Furthermore, there is no work that we are aware of that assesses the overall effect of recent changes in training and child care programs.[5] The work on the effects of welfare waivers has examined program caseloads rather than employment, and has reached conflicting results.[6]

We examine the major policies affecting the labor supply of single mothers during the 1984 to 1996 period using two data sets, the Current Population Survey (CPS) Outgoing Rotation Group Files and the March CPS Files. By investigating several programs at once using thirteen years of individual data, we account for their separate effects, and we can directly compare the programs using the same sample, time period, and methods. Our approach improves on the common past research strategy of examining changes in one of these policies in isolation over a short time period or with a single cross section of data.

The estimates from our main specifications suggest that the EITC and other tax changes account for over 60 percent of the 1984–1996 increase in the weekly and annual employment of single mothers (relative to single women without children). Welfare waivers and other changes in AFDC account for smaller, but still large shares of the increase for both employment measures. Changes in Medicaid, training, and child care programs play a smaller role. Our estimated effects of tax and EITC changes are fairly robust across time periods and specifications. We find larger effects for less educated women, and smaller, but still substantial effects when we compare changes for single mothers with different numbers of children. Some of these identification strategies result in much weaker AFDC effects. The effects of other policies on employment tend not to vary much by specification. Additionally, we find that the effects of the policies on total hours worked are very similar to the employment results.

The structure of the paper is as follows. Section II provides a theory of the decision to work and states our main modeling choices. We describe the two data sets used in the empirical work in Section III. Section IV describes the main program changes

5. See Gueron and Pauly [1991] for a review of training programs for welfare recipients, and Council of Economic Advisers [1997] for a review of work on the effects of child care.

6. See Levine and Whitmore [1998], Martini and Wiseman [1997], Blank [1997], and Ziliak et al. [1997] for differing views of the relative importance of welfare waivers, economic conditions, and benefit cuts in the recent decline in welfare receipt.

over the 1984 to 1996 period that affected the labor supply of single mothers. We also provide summary statistics on program changes, discuss their theoretical impacts on labor supply, and introduce variables that measure particular policies. Section V compares the employment rates and other characteristics of single mothers and single women without children. Section VI investigates how the employment of single mothers was affected by the policies we study. We also examine alternative explanations for our results and briefly examine hours worked. Section VII provides an accounting of the contribution of different policy changes to the overall increase in employment of single mothers in recent years. We then offer conclusions in Section VIII.

II. Modeling the Work Decision

Our modeling approach combines some of the best aspects of structural methods and quasi-experimental or natural experiment type approaches. Beginning from a structural approach clarifies which variables should enter the work decision and the form in which they should enter. Our simple structural model also allows us to test some fundamental economic predictions and more convincingly simulate policy changes.[7] The quasi-experimental methods make transparent the assumptions that allow the identification of our key coefficients. By the appropriate use of control variables and simplifying assumptions, we identify our key parameters using only the sources of variation in our explanatory variables that we believe are exogenous.

We focus on employment because previous work has found that women are more responsive to wages and income in the decision to work than in the hours decision (see Heckman [1993]). The probability that a single woman works is just the probability that the expected utility when working U_w exceeds the expected utility when not working U_{nw}; i.e., $\Pr[U_w > U_{nw}]$. We take utility to be a function of income Y, nonmarket time L, an indicator for welfare participation P (which captures transaction costs or stigma), other demographic and other control variables X, and an additive stochastic term ϵ. Thus, the probability of work is just

7. Because of the simplifications we make to improve the model's tractability, one may not want to consider our approach fully structural. As with any structural model, simulations that rely heavily on simplifying assumptions may give misleading results.

$$\Pr[U(Y_w, L_w, P_w, X) > U(Y_{nw}, L_{nw}, P_{nw}, X)], \tag{1}$$

where the randomness in this event comes from the stochastic term ϵ.

Income when working is pretax earnings minus taxes, plus AFDC and Food Stamps, plus Medicaid benefits. Income when not working is the maximum AFDC/Food Stamp benefit and Medicaid benefits. In each case we calculate the earnings, taxes, and benefits for a given individual incorporating family composition (number and ages of children), and characteristics of state and federal policies at the time. We calculate real income and benefits across states using a cost of living index that depends on state housing costs. The decision to work should depend on the real return to work, not the nominal return.[8]

A key issue in implementing this approach is the form of the uncertainty about a woman's wage and hours should she work. In the estimates reported here, we take a woman to have no more knowledge of her potential wage and hours than we do as researchers.[9] Thus, we take her wage to be a random draw from a distribution (to be specified below) and her hours worked to be a random draw from a distribution (also to be specified below) that is conditional on the wage realization. Then the probability of working is just

$$\Pr\{E[U_w] > U_{nw}\}, \tag{2}$$

where the expectation here is over the joint wage and hours distribution.

To estimate equation (2), we take the distribution of ϵ to be normal and take U to be linear in income and nonmarket time (we have relaxed this latter assumption in other work). In the linear case (2) has a very simple form:

$$\Pr\{\alpha(E[Y_w] - Y_{nw}) + \beta(E[L_w] - L_{nw}) - \rho(E[P_w] - P_{nw}) + X'\gamma > \epsilon_{nw} - \epsilon_w\}, \tag{3}$$

where X is other variables that may affect the work decision such

8. Our base specification includes a state cost of living adjustment following the approach of National Research Council [1995]. One can argue that housing costs largely reflect local amenities. However, to the extent that these amenities are largely fixed benefits of an area, one would still want to account for state differences in housing costs when calculating the value of additional income.

9. We have also considered two alternatives: 1) a woman knows her wage and hours before choosing to work, and 2) a woman knows her wage, but not her hours before choosing to work. Our experiments with these alternatives yielded results qualitatively similar to our main results.

as demographic variables and characteristics of state welfare waivers, training programs, and child care programs. This specification also allows fixed costs of work which vary across demographic groups. Under the normality assumption (3) can be rewritten as

$$(4) \quad \Phi\{\alpha(E[Y_w] - Y_{nw}) + \beta(E[L_w] - L_{nw}) - \rho(E[P_w] - P_{nw}) + X'\gamma\}.$$

We make the simplifying assumption that nonworking single mothers participate in welfare and that working single mothers participate if their earnings are low enough to qualify them for aid. This assumption is clearly a simplification as some women who qualify for aid will not participate because of the transaction costs or stigma of doing so. Past work on program takeup suggests that about 75 percent of those eligible for AFDC and about 50 percent of those eligible for Food Stamps participate (for a recent review of past work see Blank and Ruggles [1996]). However, AFDC takeup rates between 80 and 90 percent are probably closer to the truth given the underreporting of welfare receipt in standard data sets (see Bavier [1999]). We also assume that all single women without children *do not* participate in welfare programs.[10]

We generalize (4) by allowing the coefficients on the different components of income to differ, since income from different sources may be valued differently. For example, we allow the effect of welfare income (AFDC plus Food Stamps) to differ from that of labor income, taxes paid, and Medicaid coverage. Welfare income may be valued less than labor income because of a variable component to the transaction costs or stigma of welfare participation (see Moffitt [1983]). Medicaid may be valued at less than our calculated cost because it is an in-kind transfer, or more than cost because of its insurance component. These separate coefficients on different income terms allow for additional tests of the hypothesis that increases in the return to work make work more likely, and they allow an approach that is less restrictive, i.e., less likely to yield biased estimates.

We assume that all single mothers face the same pretax wage

10. The primary program for which single women without children would be eligible is Food Stamps. Single adults with children are more than ten times as likely to receive Food Stamps as single adults without children (authors' calculations and U. S. Department of Agriculture [1995]). Furthermore, since the Food Stamp program has not changed much over time and does not differ much by state except for interactions with AFDC, our control variables below (particularly year and number of children dummies) should account for most of these differences.

and hours distribution, and we make the same assumption for single childless women. We estimated some specifications that used a wage/hours distribution that varied with demographics, although these results are not reported here (see Meyer and Rosenbaum [1999]). Thus, expected earnings if working only vary with the controls and are absorbed by X, which includes variables for the presence and number of children, age, education, state, year, and other variables described fully below. Similarly, nonmarket time when working and not working, $E[L_w]$ and L_{nw}, respectively, are taken to be constant or to vary with X, and thus are absorbed by X. P_{nw}, which identically equals 1, is absorbed into the constant. We then obtain the employment probability:

$$\begin{aligned}(5)\quad \Phi\{&\alpha_1 E[\text{taxes}] + \alpha_2 E[\text{AFDC and Food Stamp benefits if work}] \\ &+ \alpha_3 E[\text{Medicaid coverage if work valued at cost}] \\ &- \alpha_4 \text{maximum AFDC/Food Stamp benefit} \\ &- \alpha_5 \text{Medicaid coverage if do not work valued at cost} \\ &+ \rho E[P_w] + X'\gamma\}.\end{aligned}$$

We allow the tax and welfare variables in (5) to vary with year, state, and the number and ages of children. To implement this approach, we discretize the wage and hours distribution and perform the numerical integration required in (5), allowing the hours distribution to vary with the wage level because of the pronounced dependence between the two distributions. To calculate the wage and hours distribution, we pool 1984–1996 March CPS data and estimate one distribution that we use for all years. We do this separately for single mothers and single childless women. We approximate these distributions using cells defined by 50 intervals of the joint wage and hours distribution (see Appendix 1 for details). Our approach is both tractable and yet able to capture the fairly complex and highly nonlinear budget constraints of low income single mothers. These complexities are described in detail in Section IV.

III. Data

The data used in this paper come from the Current Population Survey (CPS), a nationally representative monthly survey of approximately 60,000 households. We use two types of the CPS data, the March CPS Files and the merged Outgoing Rotation

Group (ORG) data. During each interview household members are asked whether they worked last week and their hours worked, as well as many other questions. In the March interviews, individuals are asked to provide detailed retrospective information including hours, earnings, and weeks worked during the previous year. The ORG files come from all twelve months of the year but only include the same person once in a given year. The March CPS data are from the 1985–1997 interviews, and therefore provide information on the years 1984–1996. The ORG data are from 1984–1996. We limit the sample to single women (widowed, divorced, and never married) who are between 19 and 44 years old and not in school. In the March CPS, women who were ill or disabled during the previous year or who had positive earned income but zero hours of work are also excluded. The resulting samples sizes are 373,662 for the ORG and 119,019 for the March CPS.

IV. The Policy Changes and Labor Supply

In this section we describe the major policy changes between 1984 and 1996 that affected the labor supply of single mothers. For each policy or program, we first provide some brief background information and outline the major changes between 1984 and 1996 (see Figure I for a time line depicting these changes). Next, we describe the policy variables used in the empirical work to summarize the incentive effects of these programs. Finally, we analyze the theoretical effects of these changes on labor supply, especially on the choice of whether or not to work. An in-depth discussion of the policy changes is in Meyer and Rosenbaum [2000a].

A. The EITC and Federal and State Income Taxes

In our period the most important changes in work incentives for single mothers probably came from the Earned Income Tax Credit.[11] EITC credits increased fifteenfold from $1.6 billion in 1984 to a projected $25.1 billion in 1996. Single parents received about two-thirds of these EITC dollars (see U. S. House of Representatives, Green Book [1996]; U. S. Department of the Treasury, SOI [1999]). In 1996 a single woman with two children who

11. See Liebman [1998] for a history of the EITC and a survey of many of the key economic issues.

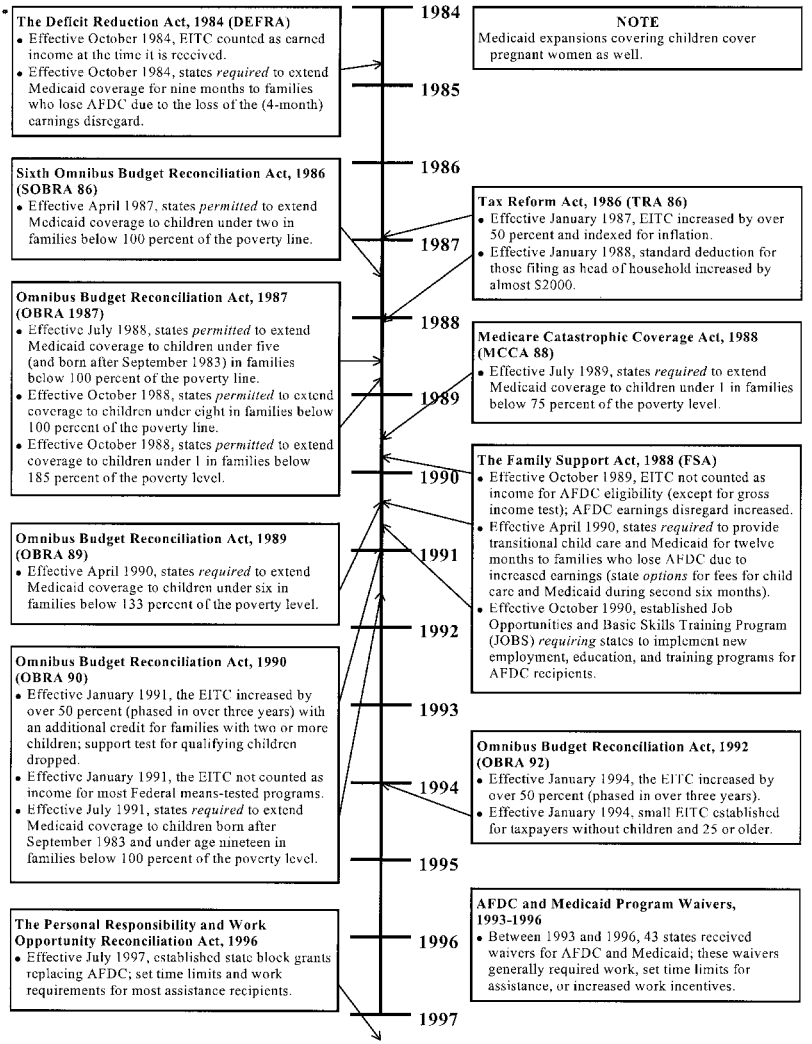

FIGURE I
Major Tax and Welfare Policy Changes Affecting Low Income Women, 1984–1997

earned less than $8890 (the phase-in range) received a 40 percent credit on dollars earned, up to a maximum of $3556. Because the credit is refundable and a mother of two with those earnings was not subject to any federal income tax (due to the standard deduction and personal exemptions), she would have received a check

from the IRS for the credit amount. With additional earnings up to $11,610, the credit amount did not change. Additional earnings beyond $11,610 and up to $28,495 (the phase-out range) resulted in a reduction in the credit by 21.06 percent of the additional earnings, until the credit was reduced to zero. This credit schedule meant that a woman with two children earning between $5000 and just under $19,000 received at least a $2000 credit.

The current EITC is the result of several legislative changes (summarized in Figure I) which greatly expanded the EITC after 1984. Between its beginning in 1975 and the passage of the Tax Reform Act of 1986 (TRA86), the EITC was small, and the credit amounts did not keep up with inflation. Beginning with the TRA86, the EITC was expanded in a number of dimensions. First, credit rates, phase-in ranges and phase-out ranges were increased considerably. Second, in 1991 the credit was expanded to provide a larger credit for families with two or more children.[12] The increment to the maximum credit for a second child was small through 1993, but beginning in 1994 the difference began to rise sharply; it rose to $490 in 1994, $1016 in 1995, and $1404 in 1996. Third, in 1991 the requirements for qualifying children were changed in a way that tended to increase eligibility.

The after-tax incomes of single women were affected by other changes in federal income taxes during this period, such as the 1987 increase in the personal exemption and the 1988 increase in the standard deduction for household heads. To illustrate the overall changes in after-tax incomes, we plot in Figure II the difference in after-tax income (earnings minus federal income taxes plus the EITC) between a woman with two children and a woman with no children for various pretax earnings levels in 1984, 1988, 1992, and 1996.[13]

Figure II illustrates several important aspects of the EITC expansions. First, between 1984 and 1988, single mothers of two with earnings between $10,000 and $20,000 experienced increases in take-home pay (relative to single women without chil-

12. There were other small program changes. From 1991 through 1993 there were small refundable credits for child health insurance premiums and for children under one. Beginning in January 1991, the EITC was not counted as income in most means-tested programs, increasing its value for very low income women.

13. Changes over time in this difference were almost entirely due to changes in the taxes paid (or credits received) by single mothers as can be seen in panel 1 of Table I. The taxes paid by single women without children hardly changed between 1984 and 1996, especially for earnings levels between $10,000 and $20,000.

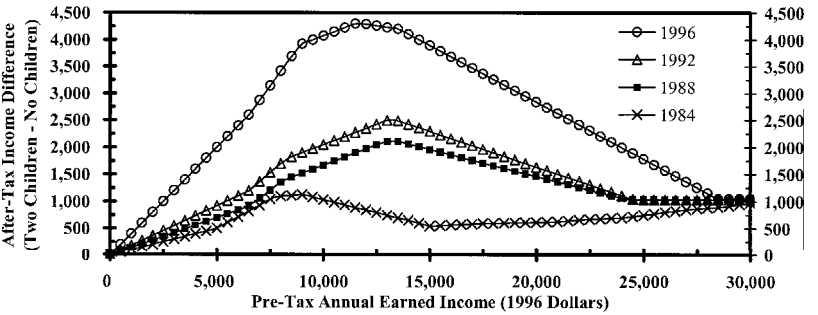

FIGURE II

After-Tax Income of a Single Mother with Two Children Minus a Single Woman without Children: 1984, 1988, 1992, 1996

All numbers are in 1996 dollars deflated with the Personal Consumption Expenditures Deflator. All women are assumed to have only earned income and to take the standard deduction. Single women with children and without children are assumed to file as head of household and single, respectively. After-tax income is income after federal taxes or credits.

dren) that ranged from $500 to $1500 (unless noted, all dollar amounts are in 1996 PCE deflated dollars). Most of this increase was due to large increases in both the maximum credit and the earnings level before the credit phase-out began. The most striking feature of Figure II is the large 1994–1996 expansions, which disproportionately affected women with two or more children. For example, the take-home pay difference for women with $7500 of earnings increased only about $600 between 1984 and 1993, but increased over $1500 between 1993 and 1996. Unlike the earlier expansions, those since 1993 dramatically increased the take-home-pay difference for very low income women (earnings under $10,000) due to large increases in the credit rate and maximum credit.

As well as federal income tax changes, we incorporate in this study the effects of state income taxes including state EITCs. By 1994 seven states had their own EITCs. The largest five of these states began their credit during the period we examine. All of the state EITCs were set as a fraction of the federal EITC and thus increased when it did. There were other state income tax changes during our sample period that reduced taxes for single mothers. More than a dozen states increased their personal exemption, increased their child credit, added a higher standard deduction, or added a separate tax schedule for household heads.

To summarize these changes in federal and states taxes, we

calculate a variable called Income Taxes if Work. This variable is the expected taxes a woman would pay in a given state and year with a given family composition and ages of children. The expectation is calculated by integrating over the wage and hours distribution of single women as described in Section II. Appendix 2 reports the mean of this variable for single mothers and single women without children for various years. Over the years 1984–1996 taxes paid by single mothers relative to single women without children fell by $1607. Thirty-nine percent of the relative fall in taxes (increase in credits) occurred in the last three years (1993–1996). About 43 percent occurred in 1987 and 1988, with 18 percent occurring between 1991 and 1993. Almost all of the fall in relative taxes was due to federal tax changes. Only $37 was due to state taxes, with all but $7 of this due to state EITCs. However, in the seven states with state EITCs the role of state taxes was much greater. In these jurisdictions, state EITCs accounted for a $215 drop in the taxes of single mothers relative to single women without children.

The theoretical effect of the EITC expansions on the annual participation decision of single parents is unambiguously positive. Since the EITC expansions have increased the after-tax return to work at all earnings levels, work is unambiguously more attractive. The effect of the EITC and its expansions on the hours of work among those working is much less clear and depends on where a person would choose to work on the pre- and postcredit budget sets. Overall, the income effect of the credit combined with the negative substitution effect that people face on the phase-out portion of the credit is expected to reduce the hours of those who work.[14]

B. AFDC, Food Stamps, and Waivers

The two programs that have been most commonly thought of as welfare are Aid to Families with Dependent Children (AFDC) and Food Stamps. We discuss Food Stamps along with AFDC

14. One might wonder whether households are aware of these tax incentives and bother to file tax returns. Awareness appears to be high [Romich and Weisner 2000; Smeeding et al. 2000], and EITC takeup appears to be high and rising. Scholz [1990, 1994] estimates takeup to be 75 percent in 1988 and between 80 and 86 percent in 1990. With the increases in the EITC after 1990 that raised the value of filing and disproportionately made eligible moderate income people who are likely to file, one might expect that the participation rate rose further. In addition, EITC awareness and outreach has increased in recent years. On the other hand, recent compliance efforts may have discouraged some potential filers.

because nearly 90 percent of AFDC recipients also received Food Stamps [U. S. House of Representatives 1996]. The AFDC program provided cash payments to families with children who have been deprived of support due to the absence or unemployment of a parent. The Food Stamp program provides low-income households with coupons to purchase food. AFDC program parameters were set by the states, while most Food Stamp parameters are the same in all states. Nevertheless, because of the interaction of the eligibility and benefit calculations of the two programs, there are interstate differences in the Food Stamps received for people in similar situations. Both of these programs are large relative to other means-tested programs, with 1996 AFDC and Food Stamp expenditures totaling $23.7 billion and $25.5 billion, respectively. Both had growing expenditures and caseloads in the late 1980s and early 1990s, with peaks in fiscal year 1994.

While much past work has summarized the AFDC and Food Stamp programs using the combined maximum benefit, this measure ignores the large interstate differences and changes over time in earnings exemptions and implicit tax rates. By 1996 fifteen states had exemptions and tax rates that differed from the standard $120 earnings exemption and the two-thirds implicit tax rate. We summarize AFDC and Food Stamps with three variables implied by our theoretical model: the maximum combined benefit, expected benefits if a person works, and the probability of AFDC receipt (which captures transaction costs or stigma). Due to cuts in AFDC, the mean maximum combined AFDC and Food Stamp benefit fell about 7 percent over the sample period. Over the same period mean benefits for a working single mother remained roughly constant as implicit tax rates were reduced.

Theory predicts that the AFDC and Food Stamp programs decrease labor supply for two reasons. First, the income effect of the guarantee amount (maximum benefit) should make employment less likely and reduce hours worked if a woman works. Second, the implicit tax rate resulting from reductions in benefits as earnings increase (captured by reductions in the benefits if work variable) also reduces the incentive to work. Thus, AFDC should decrease both the likelihood of working and hours conditional on working. However, in interpreting our estimates below, one should bear in mind that substantial research indicates that actual exemptions and implicit tax rates differ from the statutory

ones.[15] Consequently, our calculations of AFDC benefits for those who work may be fairly rough. We will return to this issue in Section VI.

Under AFDC, the Secretary of Health and Human Services (HHS) was authorized to waive specified program requirements to allow states to experiment. This waiver authority was rarely used prior to the late 1980s, but its use accelerated under Presidents Bush and Clinton. Between January 1993 and August 1996, HHS approved welfare waivers in 43 states. While states experimented with changes in nearly every aspect of AFDC, many provisions applied to small parts of states or would not be expected to have a substantial effect on the employment of single mothers. We focus on a few types of waiver provisions that were tried in many states. Our main welfare waiver variables are Any Time Limit, which equals one for single mothers in states that imposed work requirements or benefit reductions on those who reached time limits, and Any Terminations, which equals one for any single mother in a state in which a welfare case had been terminated under a welfare waiver. Some common types of provisions, such as expanded income disregards, have been incorporated in our coding of the AFDC program. Others, such as family caps (which limited the benefits for additional children) or increased resource limits (which loosened the asset restrictions for AFDC eligibility), likely have small or ambiguous effects on employment and are therefore not included.

In this paper we focus on implementation dates and actual beginning dates of terminations instead of application or approval dates. We also examine a dummy variable for states that applied for a major statewide waiver, in case this indicates a tightening of administrative requirements in a state. These variables are interacted with an indicator for whether a woman has children. In Table I we report the fraction of single women living in states that have applied for or implemented various types of waivers. Very few women were in states that had implemented significant waivers through at least 1994. The fraction of women in states that had made a major waiver application was much higher, 0.22 in 1992 and 0.85 in 1996.

15. See Fraker, Moffitt, and Wolf [1985] and Levine [1997]. Other research indicates that few AFDC recipients report their income to welfare offices [Edin and Lein 1997; Hill et al. 1999].

C. Medicaid

Medicaid is the biggest and most costly program that aids single mothers and their children. In 1994, $30.9 billion was spent on 24.8 million nonaged, nondisabled Medicaid recipients, a group that was predominantly single mothers and their children [U. S. House of Representatives, Green Book 1996, pp. 897–902]. Unlike the Food Stamp program and especially AFDC, Medicaid eligibility has expanded dramatically since 1984, resulting in a more than threefold increase between 1984 and 1994 in Medicaid expenditures on families with dependent children (and a 60 percent increase in the caseload). Prior to 1987, Medicaid eligibility for single mothers and their children generally required receipt of AFDC. In a series of expansions, Medicaid coverage was extended to low-income pregnant women and children (again see Figure I). The differences across states in the extent to which they took advantage of the permitted coverage options generated large differences in who was covered in different years in different states. Moreover, state AFDC income limits interacted with the Medicaid expansions to determine the additional families covered (see Meyer and Rosenbaum [2000b] for more details).

We measure Medicaid benefits by first calculating the number of adults and children in the family that would be covered if a woman works. We then convert these numbers to dollar values using Medicaid expenditures per child and adult averaged over all states and years.[16] As can be seen in Table I, there was a fairly steady increase over our sample period in the number of family members covered under Medicaid if a single mother works.

The theoretical effect of Medicaid expansions on the decision to work is positive, since those newly covered are those with earnings that would make them ineligible for AFDC. The Medicaid expansions also could result in some working women increasing their hours, if pre-expansion earnings limits resulted in them reducing their hours of work in order to qualify for Medicaid coverage. Overall, the effect on hours conditional on working is ambiguous, since the expansions also could result in hours decreases for women who choose to reduce their hours in order to qualify for Medicaid coverage for their children.

16. Note that in our specifications, Medicaid coverage for the nonworking is collinear with family size and number of children controls, so α_5 is not estimated.

D. Training and Child Care Programs

To capture the effect of training programs on the probability of work by single mothers, we focus on the programs specifically for AFDC applicants and recipients, first the Work Incentives (WIN) program and then the Job Opportunities and Basic Skills (JOBS) program. Total expenditures as well as the emphasis of these programs changed sharply over our period (see Table I). We construct two variables that measure the character and extent of the JOBS and WIN programs in a state and year. Because educational spending is likely to have a different effect than other spending, we split expenditures into education, and job search/other. We scale state expenditures by the size of the AFDC mandatory population. These variables are interacted with an indicator for whether a woman would be required to participate in JOBS or WIN (based on the age of her youngest child; these rules differed across states and over time), so that these variables equal zero for single women without children or with children under the age cutoff.

The effects of these training programs on labor supply likely depends on the mix of services provided and the stringency of the participation requirements. Job search assistance, job placements, and improving job skills and readiness should lower job search costs, thereby increasing the level of work for women trainees. On the other hand, even with a beneficial long-term effect on wages or employment, secondary or postsecondary education may delay entry into the workforce while women take classes, leading to a short-term negative employment effect. In any case, there is much stronger evidence of employment effects from job search assistance than from education, at least in the short run.[17]

The cost and quality of child care is likely to have an important effect on whether a woman works. The federal role in child care for low-income women expanded greatly following the Family Support Act of 1988 and the Omnibus Budget Reconciliation Act of 1990. Four large programs started during this period: AFDC Child Care, Transitional Child Care, At-Risk Child Care, and Child Care and Development Block Grants. We focus on these programs because they are particularly important for single mothers and they were the main changes over our period. Total

17. See Gueron and Pauly [1991] and U. S. Department of Health and Human Services [1997b].

TABLE I

SUMMARY CHARACTERISTICS OF POLICIES AFFECTING SINGLE MOTHERS AND SINGLE WOMEN WITHOUT CHILDREN: 1984, 1988, 1992, AND 1996

Variable	1984		1988		1992		1996	
	Children	No children	Children	No children	Children	No children	Children	No children
Annual federal/state income taxes, EITC, and 1/2 OASDHI								
At $5000 earnings	−169	352	−338	376	−533	408	−1478	194
At $10,000 earnings	118	954	−347	1356	−673	1427	−2012	1432
At $15,000 earnings	1599	2075	784	2589	502	2687	−476	2706
At $20,000 earnings	2721	3325	2477	3844	2374	3980	1686	4009
At $30,000 earnings	5466	6326	5398	6538	5527	6666	5585	6668
Annual AFDC and food stamp benefits								
At $0 earnings	7583	0	7406	0	7391	0	7056	0
At $5000 earnings	4719	0	4734	0	4791	0	4564	0
At $10,000 earnings	1871	0	1885	0	2029	0	1975	0
At $15,000 earnings	491	0	485	0	640	0	621	0
At $20,000 earnings	80	0	89	0	116	0	132	0
Medicaid: number of family members eligible								
At $0 earnings	2.65	0.00	2.62	0.00	2.66	0.00	2.68	0.00
At $5000 earnings	2.51	0.00	2.53	0.00	2.56	0.00	2.52	0.00
At $10,000 earnings	1.10	0.00	1.41	0.00	1.62	0.00	1.92	0.00
At $15,000 earnings	0.27	0.00	0.35	0.00	0.76	0.00	1.01	0.00
At $20,000 earnings	0.03	0.00	0.05	0.00	0.31	0.00	0.49	0.00
At $25,000 earnings	0.00	0.00	0.01	0.00	0.09	0.00	0.19	0.00

TABLE I
(CONTINUED)

Variable	1984		1988		1992		1996	
	Children	No children	Children	No children	Children	No children	Children	No children
Waivers								
Any time limit	0.00	0	0.00	0	0.01	0	0.39	0
Any terminations	0.00	0	0.00	0	0.00	0	0.21	0
Major waiver application	0.00	0	0.02	0	0.22	0	0.85	0
Annual training/child care dollars per eligible recipient								
Training—education	0	0	0	0	100	0	126	0
Training—job search/other	126	0	39	0	166	0	272	0
Child care	0	0	0	0	246	0	302	0
Number of observations	9391	18,914	9211	18,612	10,333	19,311	8788	15,846

Source. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG).
Restrictions. The sample includes 19–44 year-old single women (divorced, widowed, or never married) who are not in school.
Notes. These means are calculated using the characteristics of the ORG sample for the given year and are weighted. Women are assumed to be in their first four months of work, to have no unearned income, and to claim no child care expenses. Also, single women with and without children are assumed to file as head of household and single, respectively, and to claim the standard deduction. Taxes and welfare are adjusted for state cost of living differences, and all dollar amounts are expressed in 1996 dollars. See Appendix 1 for specific indices used and other details.

state and federal expenditures on these four new federal programs by state and year are scaled by the number of single mothers with children under six. These numbers can be seen in Table I, which shows a steep rise in child care expenditures between 1988 and 1992, followed by a slower rise in later years. For more detail on training and child care programs, see Meyer and Rosenbaum [1999].

V. The Determinants of Employment

We use several different econometric methods to identify the impact of the recent policy changes on the employment of single mothers. We begin with the familiar difference in differences estimator. This approach compares employment rates over time for single mothers with those for single women without children. This approach is the one taken by Eissa and Liebman [1996] in their study of the EITC over the 1984 to 1990 period. We wait until Section VI to discuss the estimates from our simple structural model.

A. Employment Rates of Single Mothers and Single Childless Women

The top panel of Table II reports the employment rates of single mothers and single women without children, along with the difference in employment rates between these two groups of single women. We report this difference, because many determinants of employment that change over time, especially wages and macroeconomic conditions, might be expected to affect all single women similarly. Other determinants of employment, particularly the tax and transfer programs that we examine, specifically affect single mothers. The bottom panel of Table II focuses on the subsample of single mothers with children under six (again relative to single women without children), a group we expect to be more responsive to changes in the rewards to work. Also, employment changes are likely to have greater effects on children, for better or worse, when they are young and their mother likely plays a larger role in their care and education.

We report two different measures of employment: whether a woman worked last week (from the ORG data) and whether a woman worked at all last year (from the March data). Each measure has its advantages. Whether a woman worked last week is probably a better measure of labor supply to use as an input to

TABLE II
EMPLOYMENT RATES FOR SINGLE MOTHERS, SINGLE MOTHERS WITH CHILDREN UNDER SIX, AND SINGLE WOMEN WITHOUT CHILDREN, 1984–1996

	CPS Outgoing Rotation Group, worked last week = 1				March CPS, worked last year = 1			
Year	Children	No children	Difference	Standard error	Children	No children	Difference	Standard error
1984	0.5854	0.8014	−0.2160	0.0059	0.7322	0.9399	−0.2077	0.0083
1985	0.5861	0.8048	−0.2187	0.0058	0.7302	0.9439	−0.2137	0.0083
1986	0.5891	0.8131	−0.2240	0.0057	0.7310	0.9450	−0.2141	0.0082
1987	0.5941	0.8179	−0.2238	0.0056	0.7382	0.9473	−0.2091	0.0081
1988	0.6027	0.8215	−0.2188	0.0058	0.7482	0.9485	−0.2003	0.0084
1989	0.6136	0.8150	−0.2015	0.0058	0.7577	0.9409	−0.1831	0.0080
1990	0.6007	0.8155	−0.2148	0.0056	0.7591	0.9424	−0.1832	0.0079
1991	0.5790	0.8031	−0.2242	0.0056	0.7428	0.9418	−0.1990	0.0079
1992	0.5790	0.7957	−0.2167	0.0057	0.7387	0.9299	−0.1913	0.0081
1993	0.5875	0.7918	−0.2044	0.0057	0.7511	0.9356	−0.1845	0.0080
1994	0.6053	0.7921	−0.1868	0.0057	0.7907	0.9312	−0.1405	0.0078
1995	0.6265	0.7971	−0.1707	0.0058	0.8072	0.9340	−0.1268	0.0080
1996	0.6450	0.7938	−0.1488	0.0060	0.8191	0.9290	−0.1098	0.0079
	Children under 6	No children	Difference	Standard error	Children under 6	No children	Difference	Standard error
1984	0.4382	0.8014	−0.3632	0.0083	0.6122	0.9399	−0.3277	0.0131
1985	0.4328	0.8048	−0.3720	0.0082	0.5966	0.9439	−0.3474	0.0133
1986	0.4362	0.8131	−0.3770	0.0081	0.6227	0.9450	−0.3223	0.0128
1987	0.4437	0.8179	−0.3742	0.0082	0.6096	0.9473	−0.3377	0.0129
1988	0.4634	0.8215	−0.3581	0.0084	0.6277	0.9485	−0.3207	0.0132
1989	0.4790	0.8150	−0.3360	0.0083	0.6282	0.9409	−0.3127	0.0127
1990	0.4569	0.8155	−0.3586	0.0079	0.6369	0.9424	−0.3055	0.0124
1991	0.4289	0.8031	−0.3743	0.0078	0.6092	0.9418	−0.3326	0.0124
1992	0.4330	0.7957	−0.3627	0.0078	0.6273	0.9299	−0.3027	0.0124
1993	0.4557	0.7918	−0.3362	0.0078	0.6428	0.9356	−0.2929	0.0122
1994	0.4796	0.7921	−0.3125	0.0079	0.6934	0.9312	−0.2378	0.0121
1995	0.5147	0.7971	−0.2825	0.0081	0.7221	0.9340	−0.2119	0.0123
1996	0.5396	0.7938	−0.2543	0.0085	0.7476	0.9290	−0.1813	0.0119

Sources. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1985–1997 March Current Population Survey (March CPS) and are weighted.

Restrictions. Both samples include 19–44 year-old single women (divorced, widowed, or never married) who are not in school. The March CPS sample excludes disabled or ill women and those with positive earned income but zero hours of work. In the second panel, single mothers without a child under six are excluded. See text for details.

policy decisions since its average captures the fraction of women working in a given week. This variable will be especially useful if those who move in or out of the workforce, on the margin, work only a few weeks during the year. On the other hand, as discussed earlier, the EITC unequivocally increases the probability of work-

ing at all in a given tax year, but for some could decrease weeks worked. If our goal is to provide a sharp test of theoretical predictions, whether a woman worked last year is a better outcome measure. We report both measures with the expectation that the effects of many of the recent policy changes on weekly employment will be smaller than on annual employment.

The employment rates reported in Table II exhibit a striking time pattern. For single mothers weekly employment increased by almost 6 percentage points between 1984 and 1996, while annual employment increased over 8.5 percentage points. Most of this increase occurred between 1991 and 1996.[18] Focusing on the subsample of single mothers with young children, the employment increases were even larger: 10 percentage points for weekly employment and 13.5 percentage points for annual employment. In contrast, the declines in both weekly and annual employment of about one percentage point for single women without children suggest that the rising employment of single mothers was not a result of better work opportunities for all single women. Moreover, the timing of the employment increases suggest that policy changes in the 1990s are likely to have played a large role.

B. Comparing Single Mothers and Single Women without Children

Appendix 2 reports descriptive statistics for single women with and without children for the years 1984, 1988, 1992, and 1996. The table indicates that single mothers tend to be older and less educated and are more likely to be nonwhite than single women without children. The age of single women without children rises appreciably over the sample period, as does the education level of single mothers. The fraction of single mothers living with parents is stable, while the rate for single women without children falls. The rates of cohabitation rise for both single women with and without children.

A potential criticism of the Table II results (and our main

18. One concern in interpreting changes in employment for single mothers during the years 1992 to 1994, is that beginning in January 1994 the CPS used a redesigned questionnaire. For a description of this CPS redesign, see Cohany, Polivka, and Rothgeb [1994], and Polivka and Miller [1998]. In Meyer and Rosenbaum [1999] we assess the extent of any bias due to the redesign using the parallel survey which provides contemporaneous responses using the new and old surveys. We also employ ORG/March comparisons using the fact that redesign affected the two data sets at a different point in time. Overall, these comparisons indicate that the CPS redesign had a small effect that, if it leads to any bias, suggests that we slightly understate the recent employment increases of single mothers.

regression results below) is that single women without children are not a good comparison group for single mothers. The means in Appendix 2 suggest the possibility that changes in the characteristics of single mothers versus single women without children could explain the two groups' differing employment rate trends. In our regression results we condition on observable characteristics, such as race and education, in order to make the two groups more comparable. It is also interesting to note that single women with and without children are quite similar in an important dimension: hourly earnings. The mean hourly earnings of women with and without children are fairly similar (and they are much closer if one controls for education).

Perhaps more importantly, one might argue that employment rates are so high for single women without children that it is unreasonable to expect this group to respond to changes in economic conditions in the same way that single mothers do. Yet, employment rates are not particularly high for low-educated single women, particularly when examining employment last week. Only 33 percent of high school dropout single mothers worked, and 48 percent of high school dropout single women without children worked last week. Nevertheless, in our later regressions, derivative estimates for our key policy variables tend to be the largest and most statistically significant for high school dropouts.

One might also wonder whether the large increases in employment that we find for single mothers, but not for single women without children, also occur for other demographic groups. In Meyer and Rosenbaum [2000a] we examine whether there are similar employment increases for two other groups with historically low employment rates: black males 19–44 and married mothers 19–44. We find that the large increases in employment of single mothers over 1984–1996 and particularly since 1991–1996 are not mirrored by other demographic groups.

Another potential criticism of our approach is that using variation across women in their marital status, number of children, and state of residence, implicitly assumes that marriage, fertility, and migration decisions are exogenous to the policy changes that we examine. The evidence on the effects of policy changes on these decisions is mixed, making the exogeneity assumption more plausible. For example, in her recent review Hoynes [1997] concludes: "Together this evidence suggests that marriage decisions are not sensitive to financial incentives." She also argues that: "Overall [the effects of welfare on out-of-wedlock

births] are often insignificant, and when they are not, they are small [pp. 129–130]." On the other hand, another recent review, Moffitt [1997], suggests that the weight of the evidence implies some effect of welfare benefits on marriage and fertility. As to location, Meyer [1999] concludes that there is a significant but small effect of welfare on migration. Overall, it is likely that endogenous single motherhood and location exert a small bias on our results.

C. *Accounting for Individual and State Characteristics*

As mentioned above, the results in Table II could be partly explained by differential changes over time in characteristics such as age and education for single women with and without children. Moreover, business cycles may differentially affect single women with and without children, thereby leading to employment shifts unrelated to policy changes. Consequently, Table III presents probit employment estimates for single women controlling for demographic and business cycle changes. We include a large number of controls for differences between the two groups, and we include the unemployment rate as well as its interaction with whether or not a woman has children. The specification that we estimate is

$$\Pr(E_{it} = 1) = \Phi\{\alpha X_{it} + \beta_t \mathrm{YEAR}_t + \gamma_t(\mathrm{YEAR}_t * \mathrm{ANYCHILDREN}_i)\}, \quad (6)$$

where E_{it} equals one if woman i from year t reports positive hours worked in the reference week for the ORG (or the previous year for the March CPS), X_{it} is a vector that includes demographic and business cycle variables, YEAR_t is an indicator variable for year t, and $\mathrm{ANYCHILDREN}_i$ equals one for a woman with children. The year dummies control for labor market trends in overall female employment and the X vector controls for demographic and business cycle effect differences between the groups, especially compositional shifts over time. Thus, differences between γ_t coefficients give difference-in-differences estimates controlling for these other factors. These differences can be interpreted as estimates of the combined effect of changes in all factors affecting the employment of single mothers relative to single women without children.

The demographic and business cycle variables accounted for in Table III include controls for state, race, ethnicity, age, educa-

TABLE III
PROBIT EMPLOYMENT PROBABILITY ESTIMATES FOR SINGLE WOMEN, 1984–1996

	ORG, worked last week = 1 (1)		March CPS, worked last year = 1 (2)	
Explanatory variable	Average derivative	Standard error	Average derivative	Standard error
Any children * 1984	−0.0797	0.0107	−0.1087	0.0160
Any children * 1985	−0.0856	0.0105	−0.1199	0.0156
Any children * 1986	−0.0857	0.0103	−0.1144	0.0153
Any children * 1987	−0.0880	0.0099	−0.1056	0.0144
Any children * 1988	−0.0837	0.0096	−0.0918	0.0140
Any children * 1989	−0.0663	0.0094	−0.0745	0.0131
Any children * 1990	−0.0788	0.0095	−0.0832	0.0136
Any children * 1991	−0.0823	0.0102	−0.0916	0.0151
Any children * 1992	−0.0747	0.0106	−0.0706	0.0159
Any children * 1993	−0.0601	0.0101	−0.0830	0.0153
Any children * 1994	−0.0538	0.0098	−0.0388	0.0145
Any children * 1995	−0.0405	0.0096	−0.0154	0.0143
Any children * 1996	−0.0121	0.0097	0.0042	0.0140
Nonwhite	−0.0902	0.0019	−0.0727	0.0033
Hispanic	−0.0405	0.0030	−0.0608	0.0033
Age 19–24	−0.0210	0.0024	−0.0077	0.0055
Age 25–29	0.0070	0.0024	−0.0107	0.0095
Age 35–39	−0.0049	0.0026	0.0008	0.0052
Age 40–44	−0.0108	0.0028	0.0107	0.0116
High school dropout	−0.2161	0.0022	−0.1512	0.0032
Some college	0.0870	0.0019	0.0989	0.0055
Bachelors	0.1441	0.0025	0.1755	0.0055
Masters	0.1295	0.0040	0.1927	0.0095
Divorced	−0.0068	0.0028	0.0062	0.0052
Widowed	−0.1201	0.0080	−0.1218	0.0116
Any children * divorced	0.1154	0.0038	0.0720	0.0063
Any children * widowed	0.0978	0.0097	0.1148	0.0137
[of children under 18	−0.0404	0.0014	−0.0325	0.0020
[of children under 6	−0.0955	0.0020	−0.0699	0.0027
Pregnant	·	·	−0.1333	0.0063
Unearned income ($1000s)	·	·	−0.0035	0.0003
Central city	·	·	−0.0230	0.0030
State unemployment rate (%)	−0.0113	0.0008	−0.0101	0.0015
Any children * state unemployment rate (%)	0.0017	0.0010	0.0032	0.0017
Number of observations	373,662		119,019	

Sources. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1985–1997 March Current Population Survey (March CPS).

Restrictions. See Table II for sample restrictions.

Controls. Additional controls include indicators for state, year, calendar month, and calendar month interacted with any children (ORG).

Notes. Unearned income includes interest, dividend, Social Security, veterans' benefits, and retirement income. The omitted group is white, non-Hispanic, age 30–34, never married, and not pregnant (March CPS). She does not live in a central city (March CPS) and has only a high school education. See text for details.

tion, marital status, marital status interacted with a children indicator, the number of children under six and eighteen, the state unemployment rate, the state unemployment rate interacted with a children indicator, (for the March CPS only) controls for pregnancy, central city and unearned income, and (for the ORG only) controls for month and month interacted with a children indicator. Note that the difference-in-differences calculated by subtracting one YEAR * ANYCHILDREN coefficient from another are hardly affected by including the controls.[19] For example, between 1984 and 1996 the weekly employment of single mothers relative to single women without children rises 7.1 percentage points without controls and 6.8 percentage points with controls.[20] For annual employment, the difference-in-differences estimator for 1984 to 1996 suggests an 11.7 percentage point increase in the relative annual employment of single mothers without controls and an 11.3 percentage point increase with controls. Again, most of the increase occurs between 1991 and 1996. Therefore, these difference-in-difference estimates suggest a potential role for policy changes, especially since 1991.

VI. Policy Variables and Employment Using our Simple Structural Model

We now move on to our main approach that uses our simple structural model to distinguish between the different policies and to provide estimates that have a clearer interpretation. While some of the estimates rely on comparisons of single mothers and single women with children over time, other estimates use a variety of other sources of identifying variation in our key explanatory variables. In some specifications, the identifying variation comes from differences in taxes and benefits for families of different sizes and in different states, as well as changes in these taxes and benefits over time, and differences in state living costs.

Table IV reports estimates of our structural model of the

19. Due to the difficulty in gauging the magnitude of probit coefficient estimates, instead we report derivatives of the probability of working with respect to each of the explanatory variables, averaged over the single mothers in the sample. Thus, differences in the average derivatives for the YEAR * ANYCHILDREN variables give changes over time in the difference in employment between single women with and without children, analogous to the changes that can be calculated from Table II.

20. The "without controls" results come from a weighted probit including only the year dummies and YEAR * ANYCHILDREN interactions.

effects of tax and welfare policy on the probability that a woman works. These specifications provide estimates of the parameters in expression (5) of Section II, and can be used to obtain estimates of the effects of the different policy changes during the 1984–1996 period. These specifications also provide coefficients that can be used to summarize the effects of a wide range of policies and that can be used to simulate other policies. In addition to the variables shown in Table IV, each of these probits include the control variables reported in Table III (except for the YEAR * ANYCHILDREN interactions) along with a large number of family composition variables listed in the table notes. These control variables imply that we are *not* using simple differences across family types to identify our coefficients. We are using changes over time or differences across states in how different families are treated. We focus first on the full sample specifications in columns (1) and (5).

All of the coefficients on the income variables have the signs that are implied by our simple structural model and are significantly different from zero.[21] Lower taxes and maximum welfare benefits increase employment, while higher welfare benefits if a woman works (due to lower implicit taxes on earnings) increase employment. Rather than restricting the income variables to enter the work/nonwork decision as a single expected income variable, we have allowed the coefficients on the different components of income to differ. It is, thus, encouraging that the coefficients on the income tax and welfare variables have roughly the same magnitude, as expected. The one exception to this rule is that the coefficient on Welfare Benefits if Work in the weekly employment equation is substantially larger than the other income coefficients.

A. Taxes

The Income Taxes if Work coefficient implies that a one thousand dollar reduction in income taxes if a woman works increases employment last week by 2.7 percentage points, and increases employment last year by 4.5 percentage points. Both of these effects are strongly significant. These coefficients indicate elasticities of the participation rate with respect to the return to

21. We examined the importance of allowing for correlation among the error terms at the level of state * year * ANYCHILDREN using STATA. These standard errors are very close to those without this correction for clustering.

TABLE IV

PROBIT ESTIMATES OF THE EFFECT OF POLICY VARIABLES ON THE EMPLOYMENT OF SINGLE WOMEN

AVERAGE DERIVATIVE (STANDARD ERROR)

	ORG, worked last week = 1				March CPS, worked last year = 1			
	Years of education				Years of education			
	All	< 12	12	> 12	All	< 12	12	> 12
Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income taxes if work	−0.0273	−0.0417	−0.0334	−0.0182	−0.0449	−0.0879	−0.0526	−0.0207
in $1000s/year	(0.0034)	(0.0080)	(0.0057)	(0.0051)	(0.0053)	(0.0150)	(0.0090)	(0.0063)
Welfare maximum benefit	−0.0340	−0.0425	−0.0357	−0.0218	−0.0295	−0.0579	−0.0349	−0.0068
in $1000s/year	(0.0024)	(0.0056)	(0.0040)	(0.0036)	(0.0038)	(0.0106)	(0.0063)	(0.0045)
Welfare benefit if work	0.0772	0.0654	0.0916	0.0539	0.0571	0.1177	0.0626	0.0233
in $1000s/year	(0.0073)	(0.0171)	(0.0121)	(0.0109)	(0.0107)	(0.0299)	(0.0177)	(0.0125)
Probability of AFDC receipt	−0.1985	−0.2926	−0.2547	−0.1087	−0.1742	−0.2694	−0.2019	−0.1194
if work	(0.0239)	(0.0522)	(0.0398)	(0.0363)	(0.0348)	(0.0944)	(0.0586)	(0.0417)
Medicaid if work	−0.0096	−0.0040	0.0013	−0.0167	−0.0045	−0.0119	0.0007	−0.0072
in $1000s/year	(0.0033)	(0.0066)	(0.0056)	(0.0055)	(0.0044)	(0.0109)	(0.0076)	(0.0059)
Waiver—any time limit	0.0136	0.0408	0.0192	−0.0065	0.0191	0.0256	0.0072	0.0169
(Indicator variable)	(0.0071)	(0.0160)	(0.0119)	(0.0102)	(0.0125)	(0.0329)	(0.0209)	(0.0149)
Waiver—any terminations	0.0222	0.0355	0.0354	0.0124	0.0482	0.1174	0.0532	0.0148
(Indicator variable)	(0.0110)	(0.0260)	(0.0181)	(0.0158)	(0.0223)	(0.0607)	(0.0375)	(0.0250)
Training—education	−0.0805	−0.0824	−0.0715	−0.0563	−0.0759	−0.0708	−0.1222	−0.0257
in $1000s/year	(0.0190)	(0.0430)	(0.0311)	(0.0283)	(0.0310)	(0.0849)	(0.0507)	(0.0376)

TABLE IV
(CONTINUED)

	ORG, worked last week = 1				March CPS, worked last year = 1			
	Years of education				Years of education			
	All	< 12	12	> 12	All	< 12	12	> 12
Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Training—job search/other	0.0446	0.0472	0.0607	0.0260	0.0526	0.0669	0.0643	0.0284
in $1000s/year	(0.0117)	(0.0272)	(0.0190)	(0.0175)	(0.0192)	(0.0528)	(0.0317)	(0.0236)
Child care	0.0227	0.0272	0.0190	0.0226	0.0229	0.0438	0.0175	0.0194
in $1000s/year	(0.0065)	(0.0148)	(0.0104)	(0.0104)	(0.0100)	(0.0287)	(0.0164)	(0.0119)
State unemployment rate	−0.0100	−0.0098	−0.0101	−0.0105	−0.0083	−0.0133	−0.0090	−0.0053
in percentage points	(0.0007)	(0.0020)	(0.0013)	(0.0010)	(0.0014)	(0.0044)	(0.0024)	(0.0016)
Any children * state unemp rate	−0.0001	0.0009	−0.0010	0.0008	0.0011	0.0042	−0.0009	0.0022
in percentage points	(0.0009)	(0.0021)	(0.0014)	(0.0013)	(0.0014)	(0.0042)	(0.0024)	(0.0017)
Number of observations	373,662	51,146	134,432	188,084	119,019	15,994	41,060	61,965

Sources. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1985–1997 March Current Population Survey (March CPS).

Restrictions. See Table II for sample restrictions. Specifications (2) and (6) are restricted to high school dropouts, (3) and (7) to high school graduates, and (4) and (8) to those with an education beyond high school.

Controls. In addition to the variables in Table III (except for the interactions between year and any children), the following controls are included: indicators for state, year, calendar month, and calendar month interacted with any children (ORG), whether at least one, two, three, and four or more children are potentially AFDC eligible, whether at least one and at least two children are EITC eligible, and whether at least one child is under six, under three, under two, and under one. Last, continuous variables for the number of children under each age between one and nineteen are included.

Notes. In all specifications, the tax, welfare, and Medicaid variables are calculated using a joint hours/wage distribution, estimated separately for single women with and without children. Taxes and welfare are adjusted for state cost of living differences, and all dollar amounts are expressed in 1996 dollars. See Appendix 1 for specific indices used and other details.

work of 1.07 for any employment during the year and 0.83 for work in an average week. We also estimated specifications with separate coefficients on state and federal income taxes, although for brevity these full estimates are not reported here. The results for federal taxes were similar to all taxes, while the derivative (standard error) for state income taxes was a large and significant −0.0336 (0.0083) in the ORG sample and a smaller and insignificant −0.0165 (0.0139) in the March sample. Thus, while the state tax estimates are much less precise and differ in the two samples, they give the same message as the other tax coefficients; i.e., that the labor supply of single mothers responds to taxes.

B. Welfare

The full sample specifications of columns (1) and (5) also indicate substantial effects of welfare on employment. A one thousand dollar reduction in the annual Welfare Maximum Benefit (the AFDC plus Food Stamp benefit a women receives if she does not work) increases employment last week by 3.4 percentage points, and increases employment last year by 3.0 percentage points. This calculation holds constant the other welfare variables, Welfare Benefits if Work and Probability of AFDC Receipt if Work, that generally change with the maximum benefit. The Welfare Benefits if Work effect is sizable, implying that a one thousand dollar increase in benefits when one works increases employment last week by 7.2 percentage points and last year by 5.7 percentage points. These estimates suggest substantial positive employment effects of reductions in implicit tax rates and increases in earnings disregards.

The transaction costs or stigma of welfare receipt as measured by the Probability of AFDC Receipt if Work variable is negative and significantly different from zero as expected (see equation (5)). The magnitude of this coefficient can be gauged by comparing it with the coefficients on the variables denominated in thousands of dollars. Such comparisons suggest a transaction cost of several thousand dollars, with the exact number depending on the employment measure and the income variable used. For example, using the Welfare Benefits if Work coefficient in the ORG sample yields a transaction cost estimate of $2571, while the March sample implies an estimate of $3051. This result agrees with past studies as well as ethnographies that have tended to find substantial transaction costs or stigma of welfare receipt.

To assess the effect of cutting the AFDC benefit, one needs to incorporate the effects of all three of the welfare variables and the Medicaid if Work variable. When the AFDC maximum benefit and payment standard are cut, they not only reduce benefits if one does not work, but also reduce benefits if one does work. They also decrease the likelihood that a working mother will be on welfare at all, thereby reducing both her Medicaid eligibility and her AFDC transaction and stigma costs. When we do the full calculations, we find that a 10 percent cut in the maximum benefit ($324 annually) increases both the annual and weekly employment rate by about 1.0 percentage points.

Despite a more detailed calculation of welfare incentives than most past work and the use of panel data techniques, we think there are important potential sources of bias in these estimates. We should also note that by dividing the effect of welfare into income when working and when not, and by estimating a separate term for transaction costs/stigma we are putting the theoretical predictions to a more severe test than most work. As discussed in Section IV, the Welfare Benefits if Work variable and the Probability of AFDC Receipt if Work variable are more difficult to calculate precisely than our other variables. The larger coefficient on the Welfare Benefits if Work variable could also be due to the scale of this variable being inappropriately low. The earnings distribution used to calculate expected benefits puts most of the weight on earnings levels where welfare benefits would be low or zero. It is very likely that we should use an earnings distribution that puts greater weight in the left tail, since women who work while on welfare rarely report all of their earnings to the welfare office [Edin and Lein 1997]. The reasons for possible bias in the Probability of AFDC Receipt if Work variable are similar. The coefficients on these two variables tend to both be large in the same specifications with their opposite signs canceling each other out.

C. Medicaid

We find little effect of Medicaid on the employment decisions of single mothers. Theory predicts that the Medicaid if Work variable will have a positive effect on employment. The variable has the opposite effect from this prediction in both samples, although the coefficient estimates are small and usually are not significantly different from zero. This result is not completely unexpected given the weak and conflicting findings in past work.

Part of the difficulty is the uncertainty about individual knowledge of Medicaid rules and their valuation of the benefits. We have tried a large number of alternative specifications, none of which indicates a large effect of Medicaid. A full accounting of these results can be found in Meyer and Rosenbaum [2000b].

D. Welfare Waivers and Time Limits

The AFDC waiver variables have the expected effect on employment, and their coefficients are significantly different from zero. Both the implementation of a time limit on welfare receipt and the actual termination of benefits under a work requirement or time limit waiver are predicted to increase employment by between 1.4 and 4.8 percentage points. However, until the last years of our sample, the overall importance of such waivers is small. Even by 1994, only 5 percent of single mothers lived in states with a time limit, and less than half of 1 percent lived in states that had begun to terminate benefits.

One should be cautious in interpreting the waiver coefficients, especially in attributing effects to the implementation of particular provisions of recent waivers or the termination of cases per se. The perception of welfare changes by potential welfare recipients, the attitudes of case workers, and differences in state implementation of policies likely play a large role in influencing the welfare caseload and consequently employment. It is also econometrically difficult to disentangle which provisions of a waiver are the most important, since states typically implemented several changes to their AFDC programs under waivers at the same time. The reported coefficients are partly the effect of the particular actions coded and partly a proxy for other changes going on in the states.

Recognizing these limitations, the strength of the evidence here for a causal interpretation of the waiver results is much greater than in the studies of welfare caseloads. First, we use implementation dates, rather than application or approval dates, which are at best loosely related to when provisions are enforced. Second, when we account for state intentions to reform welfare as indicated by whether or not a state has made a major waiver application, this variable has little effect. Third, one or two year leads of our time limit and termination variables have small and insignificant coefficients, suggesting that the provisions per se, rather than publicity or administrator attitudes lead to the employment increases. This result contrasts with those of Blank

[1997] and Levine and Whitmore [1998] who found strong effects of leads of waiver variables on caseloads.

E. Training and Child Care

The last three coefficient estimates in Table IV measure the employment effects of expenditures on training and child care. Higher expenditures on job search and other training and on child care are associated with a higher employment rate for single mothers. Training expenditures on education have a negative effect that is significant in both samples. The job search coefficients imply that an increase in expenditures of one thousand dollars (about two-thirds of average expenditures) would increase the employment rate for single mothers without young children by over four percentage points. Since single mothers without children young enough to exempt them from training programs make up about half of all single mothers, the overall effect would be over two percentage points. An increase in federal and state child care expenditures of five hundred dollars per single mother with a child under six (slightly less than the mean in 1996) is associated with about a one percentage point increase in both weekly and annual employment. These effects are quite substantial per dollar expended. The training result on education is not surprising given the weaker results in the literature on classroom training and the possible short-term effect on employment as women are in classrooms rather than jobs.

F. Results by Education Group

Table IV also reports separate estimates for the effects of the policy variables for three education groups: less than high school, high school, and some college. We would expect a priori that the policy variables, which mostly capture taxes and benefits received by low-income women, would have the greatest effect on high school dropouts, less of an effect on those with a high school degree, and even less of an effect on those with some college.[22] Overall, the results by level of education are consistent with the hypothesized larger effects on the less educated. The derivatives tend to be much larger in absolute value for high school dropouts than they are in the full sample, and much smaller for those with

22. The estimates use a fixed wage/hours distribution (that does not vary by education) to calculate the income and benefit variables so that the explanatory variables are comparable across the columns.

some college than in the full sample. For example, a one thousand dollar cut in taxes (or increase in tax credits) for high school dropout single women is predicted to increase their employment by 4.2 percentage points in a typical week and increase work at all during the year by 8.8 percentage points. The corresponding numbers for those with some college education are 1.8 percentage points and 2.1 percentage points. Many of the other policy variable derivatives also fall with increased education.[23]

G. Unemployment and Macroeconomic Conditions

Table IV also reports the coefficients on the state unemployment rate and its interaction with a dummy variable for a single woman having children. The unemployment rate is strongly significant and implies that for single women without children a one percentage point increase in the unemployment rate is associated with a 1.0 percentage point decrease in employment in a typical week and a 0.8 percentage point decrease in work anytime during the year. On the other hand, the interaction of the unemployment rate with being a single mother is small and not significantly different from zero. The point estimates imply that a one percentage point increase in the unemployment rate is associated with only a 0.01 percentage point decrease in a typical week and 0.1 percentage point increase any time during the year in the employment of single mothers relative to single women without children. These coefficients indicate a strong *and similar* responsiveness of both groups of single women to the state of the macroeconomy. This result is favorable for the use of single women without children as a comparison group for single mothers.

H. Alternative Specifications

Since many of the changes in policy, notably welfare reform, took place in recent years, and a well-publicized decline in the welfare rolls began in 1994, we reestimate the full sample specifications of Table IV, dropping the years 1994–1996 along with the waiver variables (which are nearly always zero through 1993). The estimates from this shorter sample, which are reported in columns (1) and (5) of Table V, are very close to those

23. The derivatives might be lower for groups with higher levels of education, because their employment rates are higher, leaving less room for increases in employment. However, the drop in the magnitude of the policy variable derivatives with more education is greater than it is for other control variables such as the unemployment rate.

TABLE V

PROBIT ESTIMATES OF THE EFFECT OF POLICY VARIABLES ON THE EMPLOYMENT OF SINGLE WOMEN, ALTERNATIVE SPECIFICATIONS
AVERAGE DERIVATIVE (STANDARD ERROR)

	ORG, worked last week = 1				March CPS, worked last year = 1			
Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income taxes if work	−0.0289	−0.0135	−0.0501	−0.0055	−0.0430	−0.0253	−0.0558	−0.0305
in $1000s/year	(0.0045)	(0.0087)	(0.0051)	(0.0084)	(0.0074)	(0.0129)	(0.0087)	(0.0133)
Lagged income taxes if work	·	·	·	−0.0263	·	·	·	−0.0175
in $1000s/year	·	·	·	(0.0092)	·	·	·	(0.0148)
Welfare maximum benefit	−0.0375	−0.0107	−0.0464	−0.0340	−0.0291	−0.0011	−0.0445	−0.0296
in $1000s/year	(0.0029)	(0.0065)	(0.0033)	(0.0024)	(0.0047)	(0.0092)	(0.0056)	(0.0038)
Welfare benefit if work	0.0911	0.0107	0.1027	0.0766	0.0644	−0.0080	−0.0882	0.0567
in $1000s/year	(0.0089)	(0.0106)	(0.0099)	(0.0073)	(0.0132)	(0.0144)	(0.0157)	(0.0107)
Probability of AFDC receipt	−0.2104	−0.1044	−0.2410	−0.1950	−0.2056	−0.0837	−0.2665	−0.1717
if work	(0.0297)	(0.0336)	(0.0327)	(0.0239)	(0.0433)	(0.0501)	(0.0518)	(0.0348)
Medicaid if work	−0.0133	0.0029	−0.0209	−0.0095	−0.0079	0.0055	−0.0107	−0.0045
in $1000s/year	(0.0046)	(0.0037)	(0.0045)	(0.0033)	(0.0059)	(0.0049)	(0.0066)	(0.0044)
Waiver—any time limit	·	0.0171	0.0204	0.0128	·	0.0247	0.0350	0.0184
(Indicator variable)	·	(0.0080)	(0.0104)	(0.0071)	·	(0.0141)	(0.0197)	(0.0125)
Waiver—any terminations	·	0.0160	0.0456	0.0215	·	0.0355	0.0703	0.0479
(Indicator variable)	·	(0.0116)	(0.0163)	(0.0110)	·	(0.0238)	(0.0347)	(0.0223)

TABLE V
(CONTINUED)

Explanatory variable	ORG, worked last week = 1				March CPS, worked last year = 1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Training—education	−0.0755	−0.0764	−0.0728	−0.0841	−0.0804	−0.0656	−0.1396	−0.0780
in $1000s/year	(0.0237)	(0.0223)	(0.0392)	(0.0190)	(0.0401)	(0.0365)	(0.0607)	(0.0310)
Training—job search/other	0.0762	0.0441	0.0106	0.0428	0.0715	0.0571	0.0849	0.0517
in $1000s/year	(0.0140)	(0.0133)	(0.0237)	(0.0117)	(0.0237)	(0.0213)	(0.0382)	(0.0193)
Child care	0.0011	0.0190	0.0071	0.0215	−0.0033	0.0171	0.0286	0.0222
in $1000s/year	(0.0092)	(0.0073)	(0.0088)	(0.0066)	(0.0140)	(0.0114)	(0.0161)	(0.0101)
1994–1996 excluded	Yes	No	No	No	Yes	No	No	No
Single mothers only	No	Yes	No	No	No	Yes	No	No
Mothers w/o children < 6 excl.	No	No	Yes	No	No	No	Yes	No
Number of observations	292,731	122,966	303,396	373,662	93,816	40,818	95,786	119,019

Sources. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1985–1997 March Current Population Survey (March CPS).

Restrictions. See Table II for sample restrictions. Specifications (1) and (5) exclude 1994–1996. Specifications (2) and (6) include only single mothers. Specifications (3) and (7) include single women without children and single mothers whose youngest child is less than six.

Controls. See Table IV for controls. Indicators for interactions between state and any AFDC eligible children and between year and both any AFDC eligible children and any EITC eligible children are included in specifications (2) and (6).

Notes. In all specifications, the tax, welfare, and Medicaid variables are calculated using a joint hours/wage distribution estimated separately for single women with and without children. Taxes and welfare are adjusted for state cost of living differences. Also, all dollar amounts are expressed in 1996 dollars. See Appendix 1 for specific indices used and other details.

over the full sample period. The only exception to this generalization is that the job search/other training coefficient is larger and the child care coefficient is smaller and statistically insignificant over the shorter time span. These results are among the most important in this paper, because they indicate that (1) the flurry of welfare reform measures after 1993 has not falsely led to our main results, and (2) the extended recovery of the 1990s is not an alternative explanation for our main results.

Next, we examine a sample of only single mothers. This specification identifies the effects of the income variables through changes across states and for different family sizes. In the case of the Income Taxes if Work variable, we are largely using the variation from the last few years when the EITC for women with one child was nearly unchanged but the EITC for women with two or more children rose in large steps. Thus, identification comes from using women with one child as a control group, and changing the treatment that women with two or more children receive. With single mothers only, the year indicators remove the time trend in welfare receipt and benefits, and the state indicators remove time-constant differences in state welfare benefits and much of these state cost of living differences in the income variables. Thus, the variation in welfare benefits used to identify the coefficients is now changes in state-level benefits. This identification approach examines the employment response to fairly subtle or short-run features of the welfare and tax laws. These policy changes may be overwhelmed by other factors in these specifications. Despite these potential difficulties, much of the income tax effect remains, although the estimates are much smaller. While the effect of taxes is still significant in the March CPS data, the drop in the coefficient and larger standard error leads the ORG coefficient to be insignificantly different from zero. The welfare benefit coefficients are now no longer significant. The AFDC transaction cost coefficient, however, remains significant in the ORG data, while the Medicaid coefficient has the expected sign, but remains small and insignificant in both samples.

In the third set of specifications of Table V, we only include single mothers with a child under six (and single women without children). The derivative estimates for the tax and welfare variables, including waivers, are often substantially larger in magnitude for these single mothers with young children, especially for the tax variable in the ORG sample. These specifications are of particular interest, because the effects of increased employment

on parental care is likely to be largest on these families with young children who are not likely to be in school. The last specification of Table V examines whether women learn about tax changes with a delay after they are implemented. This specification includes both the contemporaneous and one year lagged tax variables. The results are somewhat supportive of a lagged effect of taxes. In the ORG data the contemporaneous tax variable is small and insignificant, while the lagged variable is large and significant. In the March CPS, it is the contemporaneous variable that is large and significant, while the lagged variable is smaller and significant, although still substantial in size.

I. Additional Specifications and Hours Worked

We examine several other specifications that are not reported here in order to determine the benefits of studying many programs at the same time, to check the sensitivity of our results to alternative specifications, and to see whether there are particularly large effects for certain subgroups of the population. We find that ignoring some of the policy changes that we study has a substantial effect on the estimates for the remaining programs. When we include the tax variable, but leave out the other policy variables, its coefficient is about 50 percent larger in both samples. When the only policy variables that we include are Medicaid if Work and the Welfare Maximum Benefit, the Medicaid coefficient is positive and significant in the March CPS sample. When the other policy variables are not included, the waiver variables are much larger. On the other hand, the tax coefficient is hardly changed when the training and child care variables are excluded. These results suggest that the common research strategy of investigating one program in isolation has the potential to give misleading results.

We have examined the sensitivity of our results to alternative samples and variable definitions. In particular, the results are little changed by using more stringent definitions of employment, by including separated women or women in school. We also try several subgroup analyses. In particular, we examine differences between whites and nonwhites, and family heads and subfamily heads. Nonwhites appear to be more affected by welfare waivers than whites, while subfamily heads are more sensitive to taxes than family heads.

To obtain a broader picture of the effects of welfare and tax policy on labor supply, we also examined hours worked (see

Meyer and Rosenbaum [1999] for more details). Difference-in-differences estimates for hours analogous to those in Table II show large relative increases in work for single mothers over the sample period, with almost all of the change occurring after 1991. We also estimated a series of Tobit and OLS regressions to determine the effects of tax and welfare policy on hours, controlling for demographics, economic conditions, state, and year. We include the same variables as we did in Tables IV and V, although we should emphasize that these variables were constructed for our structural model of employment and so are less suitable for an analysis of hours. The effects of the policy variables in the Tobit estimates for all women whether or not they work tend to be similar to the effects on employment seen in the earlier tables. These results hold for the sample of single mothers as well as for all single women. The results are very similar for hours per year in the March CPS and hours in a typical week in the ORG. For hours worked conditioning on positive hours, the policy variables tend to have much the same signs, but smaller and less significant coefficients. Overall, the results tend to confirm the results for the main policy variables that we found in the employment probits.

VII. Which Policies Accounted for the Employment Changes?

Our simultaneous examination of many government policies makes it straightforward to estimate the relative contribution of these policies to the recent increase in employment of single mothers. In Table VI we decompose the employment increases for single mothers relative to single women without children for both the entire period (1984–1996) and the recent period of rapid employment growth (1992–1996). Overall, these decompositions indicate a large role for the EITC and other tax changes, modest roles for AFDC benefit cuts and waivers, and smaller roles for Medicaid, training, and child care increases.

Using the parameter estimates from our main specifications (specifications (1) and (5) of Table IV), the EITC explains 62 percent of the increase in weekly employment over the full 1984 to 1996 period, yet only 27 percent of the increase between 1992 and 1996. For annual employment, the EITC plays a very similar role, explaining 61 percent of the 1984 to 1996 increase and 35 percent of the 1992 to 1996 increase. The corresponding changes in employment attributed to the EITC over the full 1984 to 1996

TABLE VI

CONTRIBUTION OF POLICY CHANGES TO THE CHANGES IN THE RELATIVE EMPLOYMENT OF SINGLE MOTHERS VERSUS SINGLE WOMEN WITHOUT CHILDREN, 1984–1996 AND 1992–1996

	1984–1996				1992–1996			
	ORG		March CPS		ORG		March CPS	
Explanatory variable	Δ in emp	% of total	Δ in emp	% of total	Δ in emp	% of total	Δ in emp	% of total
Income taxes if work	0.0438	62.2%	0.0720	61.4%	0.0186	26.8%	0.0305	35.1%
Welfare maximum benefit	0.0179	25.4%	0.0156	13.3%	0.0114	16.5%	0.0099	11.4%
Welfare benefit if work	0.0005	0.7%	0.0003	0.3%	−0.0045	−6.5%	−0.0033	−3.8%
Probability of AFDC receipt if work	−0.0002	−0.3%	−0.0002	−0.1%	0.0020	2.9%	0.0017	2.0%
Medicaid if work	−0.0070	−9.9%	−0.0032	−2.8%	−0.0023	−3.3%	−0.0011	−1.2%
Total welfare benefits & Medicaid	0.0112	15.9%	0.0125	10.6%	0.0066	9.6%	0.0073	8.4%
Waiver—any time limit	0.0054	7.6%	0.0075	6.4%	0.0052	7.6%	0.0073	8.5%
Waiver—any terminations	0.0046	6.5%	0.0099	8.4%	0.0046	6.6%	0.0099	11.4%
Total welfare waivers	0.0099	14.1%	0.0174	14.8%	0.0098	14.2%	0.0172	19.8%
Training—education	−0.0101	−14.4%	−0.0096	−8.2%	−0.0021	−3.0%	−0.0020	−2.3%
Training—job search/other	0.0065	9.2%	0.0077	6.5%	0.0047	6.8%	0.0056	6.4%
Child care	0.0068	9.7%	0.0069	5.9%	0.0011	1.8%	0.0013	1.5%
Total training & child care	0.0032	4.6%	0.0050	4.3%	0.0039	5.7%	0.0039	5.6%
Demographics	−0.0073	−10.4%	−0.0068	−5.8%	0.0107	15.5%	0.0112	12.9%
Other	0.0096	13.7%	0.0172	14.7%	0.0196	28.3%	0.0158	18.2%
Total	0.0705	100.0%	0.1174	100.0%	0.0691	100.0%	0.0869	100.0%

Sources. The data are from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and the 1985–1997 March Current Population Survey (March CPS).

Notes. Δ *in emp* gives the change in the employment of single mothers (relative to single women without children) over the specified time period that is due to the given explanatory variable(s). *% of total* gives the percentage of the employment increase for single mothers (relative to single women without children) explained by the given explanatory variable(s). The relative employment increases are the average derivative estimates of the interactions in a weighted probit model including year indicators and their interactions with an any children indicator. The parameter estimates used to estimate the change in employment come from specifications (1) and (5) of Table IV, while the change over time in the policy variables comes from Appendix 2.

period and the 1992 to 1996 period are also reported in Table VI. We estimate that the EITC and other tax changes increased weekly employment 4.4 percentage points and annual employment 7.2 percentage points over the full period, with about 40 percent of this change occurring over the 1992 to 1996 subperiod. While these estimates are substantial, they bracket the EITC effects found by Eissa and Liebman [1996], and are smaller than those predicted by Dickert, Houser, and Scholz [1995] and Keane [1995].[24]

Changes in the maximum welfare benefit and implicit tax rates and the Medicaid expansions account for between 10 and 16 percent of the increase in weekly employment and between 8 and 11 percent of the increase in annual employment over either period. The effect of the Medicaid expansions themselves is usually small or negative. Conversely, the effects of welfare waivers appear to be substantial, with the estimates suggesting that policies instituted under waivers account for about 14 to 15 percent of the increase in employment over the full sample period and about 14 to 20 percent of the increase between 1992 and 1996 for both weekly and annual employment. In general, both job training and child care explain small parts of the employment increase, although in the case of weekly employment over the full period child care can account for about 10 percent of the increase.

Improved macroeconomic conditions increased employment for both single mothers and single women without children over the 1984–1996 period. Because the above calculations are for single mothers compared with single women without children, unemployment is not given a share in the decomposition. In all of the employment probits the interaction of unemployment and being a single mother had an economically small and statistically insignificant effect. Changes in state unemployment rates are estimated to have increased the absolute level of employment of single mothers by 2.0 percentage points during a typical week

24. Eissa and Liebman [1996] found up to a 2.8 percentage point increase in participation due to TRA86 (which as we indicate in Section IV accounted for 43 percent of the 1984–1996 change in taxes). Keane [1995] predicted that the 1984–1996 changes will result in a 10.7 percentage point increase in participation, while Dickert, Houser, and Scholz [1995] predicted that the 1993–1996 changes (39 percent of the full 1984–1996 change in taxes) would increase employment of single parents by 3.3 percentage points. Experimental findings such as those reported in Blank, Card, and Robins [2000] suggest substantial responsiveness of welfare recipients and other low-income people to financial incentives. These experimental results would need to be extrapolated to all single mothers and the EITC to provide comparisons.

and 1.4 percentage points during the year over the 1984–1996 period. These numbers are equivalent to 28.4 percent of the relative increase in weekly employment and 12.2 percent of the relative increase in annual employment of single mothers over the period.

In results not shown, we recalculate the shares of the employment increase due to various policies using the parameter estimates from specifications with only single mothers (specifications (2) and (6) of Table V). These results suggest a much smaller role for the EITC and other tax changes in explaining the changes in employment, ranging from 49 to 56 percent as large as those in Table VI. Changes in the maximum welfare benefit are less important, while the results for welfare waivers, job training, and child care are largely unchanged.

VIII. Conclusions

Between 1984 and 1996 tax and transfer policy were reoriented to encourage work by single mothers. Single mothers have responded to these incentives by working more, especially after 1991 and especially those with children under six. To assess which policy changes have led to the employment increases, we examine the incentives of federal and state income taxes, AFDC, Medicaid, Food Stamps and their implicit tax rates, and earnings disregards, as well as AFDC waivers instituting time limits or work requirements. Our detailed examination of these policy changes using two large micro data sets indicates that EITC and other tax changes account for over 60 percent of the 1984 to 1996 increase in the weekly and annual employment of single mothers relative to single women without children. Changes to welfare programs were less important but still account for a substantial share of the employment increases. Changes in Medicaid, training, and child care programs play a considerably smaller role. These findings are confirmed in an analysis of hours worked.

This paper makes several methodological improvements over past research, including the estimation of a simple structural model of employment which provides several independent tests of the hypothesis that single mothers respond to economic incentives. Our results indicate that financial incentives have powerful effects on single mothers' employment decisions and that the different sources of these incentives have effects of plausible magnitudes. We also find a sizable transaction cost or stigma to

welfare. We rely on less subjective measures of welfare waivers such as implementation dates and the beginning of case terminations and provide the first evidence on the effects of waivers on employment. Unlike most past work, we examine the major programs affecting single mothers together, finding that examining one or two programs in isolation can lead to biases in estimated behavioral effects.

In most of our specifications identification comes from the differences in incentives faced by single women with and without children. While we argue that single women without children are a plausible comparison group, we also provide estimates that do not rely on this comparison. Instead, these estimates rely on changes in the treatment of family size, state cost of living differences, changes in state income taxes, differences in earnings disregards and implicit tax rates across states, and changes in these parameters and welfare benefits within a state over time. Our finding of large tax and welfare effects on employment are robust, although tax effects and especially welfare effects are sometimes smaller using alternative identification strategies.

Our result that the EITC played a dominant role in the employment increases of single mothers between 1984 and 1996 suggests that policies that "make work pay" are effective in increasing work by single mothers. This lesson is important in light of the emphasis on punitive measures, such as time limits and work requirements, in the most recent welfare reforms.

Appendix 1: Description of Policy Variables

This section describes the construction of our policy variables and lists our information sources. First, we begin with the assumptions that we use to determine taxes, program participation, and benefit levels.

1. The determination of whether a woman has children and how many she has is based on the CPS family and subfamily definitions. Children in primary families (both related and unrelated) are assigned to the family head, while children in subfamilies are assigned to the subfamily head rather than to the primary family head. Children are defined as any member of the given family (primary or subfamily) under age 19 (or under 24 and a full-time student) for EITC purposes and under age 18 for all other programs.

2. In the March CPS sample, the age for tax purposes is the age at the time of the March interview. We subtract one for AFDC and Medicaid purposes. In the ORG sample, we use the age at the time of the interview for AFDC and Medicaid, but for tax purposes, we add one for interviews occurring between January and June.
3. Women have no unearned income (including child support) or assets, and their children have no earned income, unearned income, or assets; hence, earnings determine their program eligibility.
4. Single mothers are assumed to file as head of household and claim their children as dependents, while single women without children file as single. Also, all women take the standard deduction.
5. Women receiving AFDC are in their first four months of work and do not claim child care expenses.[25]
6. Single women without children do not receive Food Stamps.
7. Shelter costs (an input in Food Stamp calculations) vary only by state and over time.

A. Tax, Welfare, and Medicaid Variables

First, for each woman we calculate five quantities: *income tax liabilities* (federal and state income taxes incorporating federal and state EITCs); *welfare benefits* (AFDC plus Food Stamps); *AFDC receipt* (indicator for AFDC eligibility); and *Medicaid adults covered* and *Medicaid children covered.* Under the assumptions above, these calculations are made at 50 annual earnings levels generated from the cells of a joint wage/hours distribution. The 50 cells come from a combination of five annual hours levels (500, 1000, 1500, 2000, and 2500) and ten hourly wage levels (4, 5, 6, 7, 8, 10, 12, 15, 20, and 25).

Second, we use the wage/hours distributions described in the text to weight the above quantities. We calculate the distributions using only women with more than $500 of annual earnings. We then construct the following variables.

25. These assumptions are roughly consistent with the facts. In fiscal year 1995, over two-thirds of AFDC families with earnings were in their first four months of work, and only about 16 percent of AFDC families with earnings claimed child care expenses [U. S. Department of Health and Human Services, Characteristics of AFDC Recipients 1996].

- Income Taxes if Work is the weighted sum of *income tax liabilities* at the various annual earnings points using the wage/hours distributions described above as weights.
- Welfare Benefits if Work is the weighted sum of *welfare benefits* at the various annual earnings points using the wage/hours distributions described above as weights.
- Probability of AFDC if Work is the weighted sum of *AFDC receipt* at the various annual earnings points using the wage/hours distributions described above as weights.
- Medicaid if Work is calculated in two steps. First, we calculate the weighted sum of *Medicaid adults covered* and *Medicaid children covered* at the various annual earnings points using the wage/hours distributions described above as weights. Second, we then multiply these sums by dollar expenditures separately for adults and children. In the main specifications we use average expenditures over all states and years.
- Welfare Maximum Benefit is the *welfare benefit* assuming zero earnings.

We calculate AFDC monthly benefits (AFDC) as follows (setting quantities in parentheses to zero if negative):

$$\text{(A.1)} \quad \text{AFDC} = \min\{MAXBEN, RR*[PS - BRR*(EI - DIS)]\},$$

where

— $MAXBEN$ is the maximum benefit,
— RR is the ratable reduction,
— PS is the payment standard (the dollar amount when benefits end not counting disregards),
— BRR is the benefit reduction rate,
— EI is earned income, and
— DIS is the earnings disregard.

We calculate Food Stamp benefits in two steps (setting quantities in parentheses to zero if negative). First, we calculate the monthly shelter cost expense deduction (SED), and second, we calculate the monthly Food Stamp benefit (FS):

$$\text{(A.2)} \quad SED = (\min\{SEDC, SE - 0.5 * ((1 - EIDP) * EI + AFDC - SD)\}).$$

$$\text{(A.3)} \quad FS = (MB - 0.3*((1 - EIDP) * EI + AFDC - SD - SED)),$$

where

— *EIDP* is the earned income deduction percentage (0.18 prior to 1986, 0.20 starting in 1986),
— *MB* is the maximum Food Stamp benefit,
— *SD* is the standard deduction,
— *SE* is shelter expenses,
— *SEDC* is the shelter expense deduction ceiling.

Tax and welfare variables (and earned and unearned income variables) are adjusted for state cost of living differences using the poverty threshold index for 1990 from National Research Council [1995], which is adjusted annually using the PCE deflator. The poverty threshold index accounts for housing cost differences between states using Census housing cost data.

Sources for Taxes, Welfare, and Medicaid

We obtain the federal income tax schedules from the U. S. Department of the Treasury [various years]. The state tax information was obtained from four sources: the Advisory Committee on Intergovernmental Relations [various years], the Commerce Clearing House [various years], unpublished data from the Center on Budget Policy and Priorities, and Feenberg and Coutts [1993]. The AFDC program parameters are obtained from the U. S. Department of Health and Human Services (Characteristics of State Plans [various years]) and unpublished data from the Urban Institute. The Food Stamp parameters come from the U. S. House of Representatives (Green Book [various years]) and the U. S. Department of Agriculture [various years]. The Medicaid program information is obtained from three sources: the National Governor's Association [various dates], the Intergovernmental Health Policy Project [various years], and the U. S. House of Representatives [Medicaid Source Book 1988, 1993]. Medicaid dollar values (separately for adults and children) come from unpublished tables from the Health Care Financing Administration (HCFA).

B. Welfare Waiver Variables

- Any Time Limit is one starting with the implementation month of a waiver that imposes mandatory work requirements on families that reach time limits or results in the reduction or total loss of AFDC payments after a certain time limit has been reached (usually two years).

- Any Terminations is one beginning with the month in which a case is first terminated under a welfare waiver.
- Major Waiver Application is one beginning with the month in which a state first applies for a major statewide waiver.

Note that these variables are always zero for women without AFDC children.

Sources for Welfare Waiver Variables

The waiver variables we used are based on our reading of the waiver summaries in General Accounting Office [1997], the U. S. Department of Health and Human Services [1997c], and Savner and Greenberg [1997]. These sources generally have the implementation dates of waivers. We also consulted American Public Welfare Association [1996], Levine and Whitmore [1998], and U. S. Department of Health and Human Services [1997a]. Our classification scheme follows most closely the classification schemes in General Accounting Office [1997] and the U. S. Department of Health and Human Services [1997c].

C. Training Program Variables

These variables measure variation across states and over time in federal and state spending on welfare-to-work programs and on eligibility criteria. These numbers are based on the state level fiscal year WIN (Work Incentive) program expenditures and state level fiscal year JOBS (Job Opportunities and Basic Skills) program expenditures by component (job search, education, etc.). We calculate spending per female AFDC adult who is not exempt from participation based on the age of her youngest child. The dollars are then divided by the state average wage to obtain an amount of services provided.[26]

We calculate the distribution of the age of the youngest child, and we apportion total JOBS spending to women using the fraction of participants who are female adults. We divide spending into two categories: *education* which includes education, postsecondary education, and self-initiated education; and *other* which includes job search, job development and placement, on-the-job training, work supplementation, community work experience, self-initiated training, job skills, job readiness, and assessment and employability plan. For fiscal year 1990 it is necessary to

26. The state average wage is average hourly wage for manufacturing in the state. It is normalized so that the 1996 value = 1.00.

extrapolate WIN expenditures forward and JOBS expenditures backward to the date when the JOBS program began in a given state. We also extrapolate 1985 WIN data back to 1984, and fiscal year 1996 forward to the first three months of fiscal year 1997.

Note that the training variables are zero for women without AFDC children and women with children young enough to exempt the mother from participation in WIN or JOBS.

Sources for Training Variables

JOBS/WIN expenditure data come from unpublished U. S. Department of Health and Human Services and U. S. Department of Labor tabulations, and the U. S. House of Representatives (Green Book [various years]). To calculate the distribution of the age of youngest child for single mothers, we use data from the U. S. Department of Health and Human Services (Characteristics of AFDC Recipients [various years]) and authors' calculations from the March CPS. Wage data come from the Bureau of Labor Statistics web site.

D. Child Care Variable

Child Care expenditures are actual federal and state expenditures by state on the following four programs: AFDC Child Care, Transitional Child Care, At-Risk Child Care, and Child Care and Development Block Grants. Expenditures are put on a per-person basis by dividing through by the number of unmarried women with children less than six. This denominator is calculated using annual data on the number of women by state (from the Census Bureau) and the fraction of women in a state who are unmarried with children less than six, which is calculated from the ORG over the entire 1984–1996 period. Like training dollars, the resulting dollar value is then divided by the state average wage to obtain an amount of services provided.

Note that the child care variable is always zero for women without children less than six.

Sources for Child Care Variable

Child Care expenditures come from unpublished U. S. Department of Health and Human Service tabulations. Annual data on the number of women by state come from the U. S. Census Bureau. The fraction of women in a state who are unmarried with children less than six is calculated from the ORG by the authors. Wage data come from the Bureau of Labor Statistics web site.

APPENDIX 2: VARIABLE MEANS FOR SINGLE MOTHERS AND SINGLE WOMEN WITHOUT CHILDREN: 1984, 1988, 1992, 1996

Variable	1984		1988		1992		1996	
	Children	No children	Children	No children	Children	No children	Children	No children
Age	31.44	26.86	31.97	27.79	31.96	28.83	32.19	29.22
Nonwhite	0.371	0.155	0.363	0.162	0.384	0.178	0.377	0.207
Hispanic	0.086	0.053	0.103	0.072	0.111	0.079	0.136	0.093
High school dropout	0.262	0.094	0.246	0.091	0.241	0.094	0.211	0.092
Some college	0.211	0.297	0.234	0.305	0.256	0.317	0.311	0.317
Bachelors	0.063	0.192	0.064	0.204	0.061	0.210	0.072	0.233
Masters	0.022	0.059	0.025	0.061	0.023	0.066	0.021	0.064
Divorced	0.564	0.151	0.533	0.161	0.477	0.165	0.460	0.162
Widowed	0.066	0.010	0.055	0.010	0.047	0.012	0.038	0.012
Living with parents	0.156	0.418	0.151	0.375	0.154	0.347	0.154	0.339
Living with unrelated adult male	0.097	0.135	0.125	0.167	0.148	0.198	0.165	0.218
[of children under 18	1.681	·	1.664	·	1.707	·	1.707	·
[of children under 6	0.560	·	0.571	·	0.624	·	0.613	·
Earned income (March)	12,810	18,331	13,462	20,183	13,232	18,993	14,760	19,912
Earned income if work (March)	17,250	19,536	18,013	21,293	17,930	20,453	18,023	21,479
Annual hours if work (March)	1718	1837	1724	1894	1712	1862	1740	1881
Hourly earnings (March)	9.85	10.38	9.91	10.86	9.87	10.59	10.03	10.98
Income taxes if work	1521	2751	1030	2958	811	2967	79	2914
Welfare maximum benefit	7583	·	7406	·	7391	·	7056	·
Welfare benefit if work	1482	·	1478	·	1546	·	1488	·
Probability of AFDC receipt if work	0.255	·	0.287	·	0.266	·	0.256	·
Medicaid if work	1215	0	1359	0	1704	2	1942	4
Number of observations	9391	18,914	9211	18,612	10,333	19,311	8788	15,846

Sources. The data are primarily from the 1984–1996 Current Population Survey Outgoing Rotation Group File (ORG) and from the 1985–1997 March Current Population Survey (March).
Restrictions. See Table II for sample restrictions.
Notes. Means come from the ORG unless they are labeled (March). These means are calculated using the characteristics of the given sample for the given year and are weighted. Women are assumed to be in their first four months of work, to have no unearned income, and to claim no child care expenses. Also, single women with and without children are assumed to file as head of household and single, respectively, and to claim the standard deduction. Taxes and welfare are adjusted for state cost of living differences. All dollar amounts are expressed in 1996 dollars per year. See Appendix 1 for specific indices used and other details.

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REFERENCES

American Public Welfare Association, "Summary of Approved AFDC Waiver Actions" (Washington, DC: May 1993 and August 1, 1996).
Advisory Committee on Intergovernmental Relations, *Significant Features of Fiscal Federalism* (Washington, DC: various years).
Bavier, Richard, "An Early Look at the Effects of Welfare Reform," unpublished paper, March 1999.
Blank, Rebecca M., "What Causes Public Assistance Caseloads to Grow?" unpublished paper, May 1997.
——, "The Effect of Medical Need and Medicaid on AFDC Participation," *Journal of Human Resources,* XXIV (1989), 54–87.
Blank, Rebecca M., and Patricia Ruggles, "When Do Women Use Aid to Families with Dependent Children and Food Stamps?" *Journal of Human Resources,* XXXI (1996), 57–89.
Blank, Rebecca M., David E. Card, and Philip K. Robins, "Financial Incentives for Increasing Work and Income among Low-Income Families," in *Finding Jobs: Work and Welfare Reform,* David Card and Rebecca M. Blank, eds. (New York: Russell Sage Foundation, 2000), pp. 373–419.
Browning, Edgar K., "Effects of the Earned Income Tax Credit on Income and Welfare," *National Tax Journal,* XLVIII (1995), 23–43.
Cohany, Sharon, Anne Polivka, and Jennifer Rothgeb, "Revisions in the Current Population Survey Effective January 1994," *Employment and Earnings,* XLI (1994), 13–37.
Commerce Clearing House, *State Tax Handbook* (Chicago, IL: various years).
Council of Economic Advisers, "The Economics of Child Care" (Washington, DC: December 1997).
Danziger, Sheldon, Robert Haveman, and Robert Plotnick, "How Income Transfers Affect Work, Savings, and the Income Distribution: A Critical Review," *Journal of Economic Literature,* XIX (1981), 975–1028.
Dickert, Stacy, Scott Houser, and John Karl Scholz, "The Earned Income Tax Credit and Transfer Programs: A Study of Labor Market and Program Participation," in *Tax Policy and the Economy 9,* James M. Poterba, ed. (Cambridge, MA: MIT Press, 1995), pp. 1–50.
Edin, Kathryn, and Laura Lein, *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work* (New York: Russell Sage Foundation, 1997).
Eissa, Nada, and Jeffrey B. Liebman, "Labor Supply Response to the Earned Income Tax Credit," *Quarterly Journal of Economics,* CXII (1996), 605–637.
Eissa, Nada, and Hilary Williamson Hoynes, "The Earned Income Tax Credit and Labor Supply: Married Couples," NBER Working Paper No. 6856, December 1998.
Ellwood, David T., "The Impact of the Earned Income Tax Credit and Social Policy Reforms on Work, Marriage and Living Arrangements," *National Tax Journal,* LIII (2000), 1063–1106.
Feenberg, Daniel, and Elisabeth Coutts, "An Introduction to the TAXSIM Model," *Journal of Policy Analysis and Management,* XII (1993), 189–194.
Fraker, Thomas, Robert Moffitt, and Douglas Wolf, "Effective Tax Rates and Guarantees in the AFDC Program, 1967–1982," *Journal of Human Resources,* XX (1985), 252–263.
General Accounting Office, "Welfare Reform: States' Early Experiences with Benefit Termination" (Washington, DC: GAO, S-97-74, May 1997).
Gueron, Judith M., and Edward Pauly, *From Welfare to Work* (New York: Russell Sage Foundation, 1991).
Heckman, James J., "What Has Been Learned about Labor Supply in the Past Twenty Years?" *American Economic Review,* LXXXIII (1993), 116–121.
Hill, Carolyn, V. Joseph Hotz, Charles H. Mullin, and John Karl Scholz, "EITC

Eligibility, Participation and Compliance Rates for AFDC Households: Evidence from the California Caseload," unpublished paper, March 1999.
Hoffman, Saul D., and Laurence S. Seidman, *The Earned Income Tax Credit: Antipoverty Effectiveness and Labor Market Effects* (Kalamazoo, MI: Upjohn Institute for Employment Research, 1990).
Holtzblatt, Janet, Janet McCubbin, and Robert Gillette, "Promoting Work through the EITC," *National Tax Journal,* XLVII (1994), 591–608.
Hoynes, Hilary Williamson, "Work and Marriage Incentives in Welfare Programs: What Have We Learned?" in *Fiscal Policy: Lessons from Economic Research,* Alan J. Auerbach, ed. (Cambridge, MA: MIT Press, 1997).
Intergovernmental Health Policy Project, *Major Changes in State Medicaid and Indigent Care Programs* (Washington, DC: various years).
Jencks, Christopher, and Joseph Swingle, "Has Welfare Reform Helped or Hurt Single Moms?" unpublished paper, February 2000.
Keane, Michael, "A New Idea for Welfare Reform," *Federal Reserve Bank of Minneapolis Quarterly Review,* XXXVIII (1995), 2–28.
Levine, Judith A., "Policy Incentives Confront Everyday Realities: Integrating Economic and Sociological Perspectives on the Welfare-to-Work Transition," unpublished paper, March 1997.
Levine, Phillip B., and Diane M. Whitmore, "The Impact of Welfare Reform on the AFDC Caseload," *National Tax Association Proceedings, Ninetieth Annual Conference* (1998), 24–33.
Liebman, Jeffrey B., "The Impact of the Earned Income Tax Credit on Incentives and Income Distribution," in *Tax Policy and the Economy 12,* James M. Poterba, ed. (Cambridge, MA: MIT Press, 1998), pp. 83–120.
Martini, Alberto, and Michael Wiseman, "Explaining the Recent Decline in Welfare Caseloads: Is the Council of Economic Advisers Right?" *Challenge,* XL (1997), 6–20.
Meyer, Bruce D., "Do the Poor Move to Receive Higher Welfare Benefits?" unpublished paper, April 1999.
Meyer, Bruce D., and Dan T. Rosenbaum, "Welfare, the Earned Income Tax Credit and the Labor Supply of Single Mothers," NBER Working Paper No. 7363, September 1999.
Meyer, Bruce D., and Dan T. Rosenbaum, "Making Single Mothers Work: Recent Changes in Tax and Welfare Policy and their Effects," *National Tax Journal,* LIII (2000a), 1027–1062.
Meyer, Bruce D., and Dan T. Rosenbaum, "Medicaid, Private Health Insurance and the Labor Supply of Single Mothers," unpublished paper, November 2000b.
Moffitt, Robert, "An Economic Model of Welfare Stigma," *American Economic Review,* LXXIII (1983), 1023–1035.
——, "Incentive Effects of the U. S. Welfare System," *Journal of Economic Literature,* XXX (1992), 1–61.
——, "The Effect of Welfare on Marriage and Fertility: What Do We Know and What Do We Need to Know?" unpublished paper, December 1997.
Moffitt, Robert, and Barbara Wolfe, "The Effect of the Medicaid Program on Welfare Participation and Labor Supply," *Review of Economics and Statistics,* LXXIV (1992), 615–626.
National Governor's Association, *MCH (Maternal and Child Health) Update* (Washington, DC: various dates).
National Research Council, *Measuring Poverty: A New Approach,* Constance F. Citro and Robert T. Michael, eds. (Washington, DC: National Academy Press, 1995).
——, *Evaluating Welfare Reform: A Framework and Review of Current Work,* Robert Moffitt and Michele Ver Ploeg, eds. (Washington, DC: National Academy Press, 1999).
Polivka, Anne E., and Stephen M. Miller, "The CPS After the Redesign: Refocusing the Economic Lens," in *Labor Statistics Measurement Issues,* John Haltiwanger, Marilyn E. Manser, and Robert Topel, eds. (Chicago: University of Chicago Press, 1998), pp. 249–286.
Romich, Jennifer L., and Thomas Weisner, "How Families View and Use the

EITC: The Case for Lump-sum Delivery," *National Tax Journal,* LIII (2000), 1245–1265.
Savner, Steve, and Mark Greenberg, "The CLASP Guide to Welfare Waivers, 1997" (Washington, DC: Center for Law and Social Policy, 1997).
Scholz, John Karl, "The Participation Rate of the Earned Income Tax Credit," Institute for Research on Poverty, Madison, WI, Discussion Paper 928-90, October 1990.
——, "The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness," *National Tax Journal,* XLVII (1994), 59–81.
Smeeding, Timothy M., Katherine E. Ross, Michael O'Connor, and Michael Simon, "The EITC: Expectation, Knowledge, Use, and Economic and Social Mobility," *National Tax Journal,* LIII (2000), 1187–1210.
U. S. Department of Agriculture, *Characteristics of Food Stamp Households* (Alexandria, VA: U. S. Department of Agriculture, Food and Consumer Service, Office of Analysis and Evaluation, various years).
U. S. Department of Health and Human Services, *Characteristics and Financial Circumstances of AFDC Recipients* (Washington, DC: U. S. Department of Health and Human Services, Administration for Children and Families, Office of Family Assistance, Division of Performance Measurement, various years).
——, *Characteristics of State Plans for Aid to Families with Dependent Children* (Washington, DC: U. S. Department of Health and Human Services, Administration for Children and Families, Office of Family Assistance, various years).
——, *HHS Fact Sheet: State Welfare Demonstrations* (Washington, DC: U. S. Department of Health and Human Services, March 17, 1997a).
——, *National Evaluation of Welfare-to-Work Strategies* (Washington, DC: Administration for Children and Families, Office of the Assistant Secretary for Planning and Evaluation, December 1997b).
——, *Setting the Baseline: A Report on State Welfare Waivers* (Washington, DC: U. S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation, 1997c).
U. S. Department of the Treasury, *Statistics of Income, Individual Income Tax Returns* (Washington, DC: U. S. Department of the Treasury, Internal Revenue Service, various years).
U. S. Department of the Treasury, *Your Federal Income Tax: Tax Guide for Individuals* (Washington, DC: U. S. Department of the Treasury, Internal Revenue Service, various years).
U. S. House of Representatives, Committee on Energy and Commerce, *Medicaid Source Book: Background Data and Analysis* (Washington, DC: Government Printing Office, November 1988 and January 1993).
U. S. House of Representatives, Committee on Ways and Means, *Green Book, Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means* (Washington, DC: Government Printing Office, various years).
Winkler, Anne, "The Incentive Effects of Medicaid on Women's Labor Supply," *Journal of Human Resources,* XXVI (1991), 308–337.
Yelowitz, Aaron S., "The Medicaid Notch, Labor Supply, and Welfare Participation," *Quarterly Journal of Economics,* CX (1995), 909–940.
Ziliak, James P., David N. Figlio, Elizabeth E. Davis, and Laura S. Connolly, "Accounting for the Decline in AFDC Caseloads: Welfare Reform or Economic Growth?" unpublished paper, July 1997.