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ABSTRACT

During 1984-96, welfare and tax policy changed dramatically. The Earned Income Tax Credit was expanded, welfare benefits were cut, welfare time limits were added and cases were terminated, Medicaid for the working poor was expanded, training programs were redirected, and subsidized or free child care was expanded. Many of the program changes were intended to encourage low income women to work. During this same time period there were unprecedented increases in the employment and hours of single mothers, particularly those with young children. In this paper, we first document these large changes in policies and employment. We then examine if the policy changes are the reason for the large increases in single mothers' labor supply. We find evidence that a large share of the increase in work by single mothers can be attributed to the EITC, with smaller shares for welfare benefit reductions, welfare waivers, changes in training programs, and child care expansions. We also find that most of these policies increased hours worked. Our results indicate that financial incentives through the tax and welfare systems have substantial effects on single mothers' labor supply decisions.

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1. Introduction

In recent years, there have been enormous changes in many of the tax and transfer programs that affect single mothers. These changes have dramatically increased the incentive to work. Between 1984 and 1996, real dollars received through the Earned Income Tax Credit (EITC), which go primarily to working families with children, increased more than ten-fold. Likewise, between 1984 and 1994 the number of children receiving Medicaid increased 77 percent, while the number of covered adults with dependent children increased 35 percent. These Medicaid expansions primarily affected non-welfare families with incomes near the poverty line, making work more attractive for low-income single mothers. In the last few years nearly every state has experimented with changes in its welfare programs, often under waivers of the existing program rules. Many of these changes have imposed work requirements, time limits, or other measures to encourage single mothers to work. Finally, there have been recent increases in child care funding and job training for single mothers. These program changes combined to greatly increase the incentive for single mothers to enter the workforce. This paper examines whether these policy changes have been effective in encouraging more women to work. More precisely, we calculate the effect of each of these program changes as well as several others on the employment and hours worked of single mothers.

During this 1984 to 1996 period in which single mothers experienced a dramatic increase in the incentive to work, their weekly employment increased by about six percentage points, and their annual employment increased by nearly nine percentage points. Over the same time period, both weekly and annual employment for a plausible comparison group, single women without children, decreased by about one percentage point. The increases in employment were larger for single mothers with children under six and occurred primarily after 1991.

Understanding the relationship between the changes in government polices and the increases in the labor supply of single mothers is important for several reasons. First, there is little previous work that estimates the effects of the EITC, Medicaid, or welfare changes on whether single mothers work.

The only paper which 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.[1] In his discussion of the labor supply effects of Medicaid, Moffitt (1992) argues that there has been too little work to draw reliable conclusions.[2] Moffitt describes the labor supply effect of Aid to Families with Dependent Children (AFDC) as being subject to considerable uncertainty and notes that the broader labor supply literature has examined single mothers "only rarely."[3] 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 indicates that most 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.[4] The work on the effects of welfare waivers has examined program caseloads rather than employment, and has reached conflicting results.[5]

Second, 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. The variation in the after-tax and transfer return to work that we use here to identify labor

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[1] 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 (1995) 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.

[2] 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.

[3] See Danziger et al. (1981) and Moffitt (1992).

[4] 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.

[5] 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.

supply elasticities is due to large changes in federal and state laws. These laws applied to some individuals and not to others, or had differential effects on the incentives of different people. This source of variation is likely to be unrelated to underlying differences across individuals in their desire to work, and is thus potentially exogenous to labor supply decisions.

Third, understanding the effects of government policies has recently taken on more importance due to the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). In 1997, PRWORA eliminated the main cash assistance program for single mothers, Aid to Families with Dependent Children (AFDC), and allowed states more discretion in designing their programs for low-income single mothers. Future experimentation will be more successful if informed by recent experience.

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 Annual Demographic Files. This paper 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. By investigating several programs at once using 13 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.

The large number of changes over the 1984 to 1996 period allows us to study the labor supply effects of a wide range of social policies. We examine the federal EITC, as well as other tax changes, and state EITCs. We examine the effects of changes in many aspects of AFDC, Food Stamps, and Medicaid including: changes in AFDC benefit levels, earnings disregards and benefit reduction rates; the expansions of Medicaid coverage to low-income non-AFDC children; and the recent flurry of welfare waivers. We also examine the effects of changes in child care and training programs during this period. The labor supply responses to many of the more important recent policy changes have not been studied, including the increases in the EITC after 1990, the Medicaid expansions after 1991, the implementation of work requirements and time limits for welfare mothers, and the growth in job training and child care for low-income women.

Our base specification compares changes in employment for single mothers to those for single women without children, relying on the differential treatment of these two types of women under welfare and tax laws. These specifications also control for state specific factors common to all single women as well as a number of factors that vary by family composition. The estimates from these specifications suggest that the EITC accounts for over sixty percent of the increase in the weekly and annual employment of single mothers between 1984 and 1996. Welfare waivers appear to account for about one-sixth of the increase for both employment measures. Other changes in AFDC can account for about one-quarter of the weekly employment increase and about one-eighth of the annual increase. Changes in Medicaid, training, and child care programs play a smaller role. In other specifications, we use more subtle identification strategies to estimate the effects of policies. In these specifications, we compare changes for single mothers with different numbers of children, with different earnings opportunities, and in states with different living costs. We examine the employment effects of changes in welfare programs within a state over time and changes in state income taxes. These specifications mostly indicate similar effects of taxes, but the effects of AFDC are often smaller and less precisely estimated. The effects of other policies on employment are usually little changed. The effects of the policies on total hours worked are very similar to the employment results, while the hours per week results are muted or in a few cases are in the opposite direction.

The structure of the paper is as follows. In Section 2 we outline a theory of the decision to work and state our main modeling decisions. We describe the two data sets used in the empirical work in Section 3. In Section 4 we describe the main program changes 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. In Section 5 we report the time pattern of the employment rate of single mothers and investigate how it was affected by the policies we study. In Section 6 we examine alternative explanations for our results and describe additional specifications we have tried. In Section 7 we briefly report effects of the different policies on hours worked. In Section 8 we provide 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 9.

2. Modeling the Work Decision

Our modeling approach combines some of the best aspects of structural methods and quasi-experimental or natural experiment type approaches. The structural model clarifies which variables should enter the work decision and the form in which they should enter. The structural model also allows us to test some fundamental economic predictions and more convincingly simulate policy changes.[6] 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. Prob[$U_w > U_{nw}$]. We take utility to be a function of income Y, non-market 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 å. Thus, the probability of work is just

(2.1) $$\text{Prob}[\, U(Y_w,L_w,P_w,X) > U(Y_{nw},L_{nw},P_{nw},X) \,],$$

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

Income when working is pre-tax 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

[6] Because of the simplifications we make to improve the model's tractability, one may not want to consider our approach fully structural.

policies at the time.

We allow the coefficients on the different components of income to differ, since income from different sources may be valued differently. For example, we allow the coefficient on welfare income (AFDC plus Food Stamps) to differ from the coefficients on 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 (Moffitt, 1983). Medicaid or employer provided health insurance 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.

In equations,

$á Y_w$ = $á_0$pre-tax earnings + $á_1$taxes + $á_2$AFDC and Food Stamp benefits if work

+ $á_3$Medicaid coverage if work valued at cost, and

$á Y_{nw}$ = $á_4$maximum AFDC plus Food Stamp benefits

+ $á_5$Medicaid coverage if do not work valued at cost.

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.[7]

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.[8] 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

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[7] Our base specification includes a state cost of living adjustment following the approach of National Research Council (1995). We also estimate equations below without the state cost of living adjustment. 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.

[8] In other work we have 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.

from a distribution (also to be specified below) that is conditional on the wage realization. Then the probability of working is just

(2.2) $\text{Prob}\{ E[U_w] > U_{nw} \}$,

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

To estimate equation (2.2) we make two additional assumptions. First, we take the distribution of å to be normal. Second, we make a functional form assumption on utility. Throughout this paper we take U to be linear in income and leisure, though we have relaxed this assumption in other work. In the linear case (2.2) has a very simple form

(2.3) $\text{Prob}\{á(E[Y_w] - Y_{nw}) + â(E[L_w] - L_{nw}) - ñ(E[P_w] - P_{nw}) + X'ã > å_w - å_{nw}\}$,

where X is other variables that may affect the work decision such 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 (2.3) can be rewritten as:

(2.4) $Ö\{á(E[Y_w] - Y_{nw}) + â(E[L_w] - L_{nw}) - ñ(E[P_w] - P_{nw}) + X'ã\}$.

We make the simplifying assumption that non-working 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, takeup rates between 80 and 90 percent are probably closer to the truth given the severe underreporting of AFDC receipt in standard datasets (Bavier, 1999). We also assume that all single women without children *do not*

participate in welfare programs.[9] Then, since $E[L_w]$ and L_{nw} are taken to be constant or to vary with X, and $P_{nw}=1$, these terms are absorbed into X. Substituting the expressions for áY_w and áY_{nw} into (2.4) we obtain the employment probability

(2.5) Ö{$á_1$E[taxes] + $á_2$E[AFDC and Food Stamp benefits if work]
+ $á_3$E[Medicaid coverage if work valued at cost] - $á_4$maximum AFDC/Food Stamp benefit
- $á_5$Medicaid coverage if do not work valued at cost + ñE[P_w] + X'ã} .

We implement this approach by discretizing the wage and hours distributions to perform the numerical integration required in (2.5). We should emphasize that we allow the hours distribution to vary with the wage level because of the pronounced dependence between the two distributions.[10] We try two alternative wage and hours distributions, both of which do not vary over time and are just the March CPS empirical distributions.[11] The first distribution differs only by whether or not a women has children. The second distribution differs across 90 cells defined by full interactions of region, age, education, and race. In this second case, we use the distribution for childless women for all observations since this group's wages and hours are unlikely to be affected much by the policies examined in this paper. In both cases 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

[9] 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, Food Stamps, 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.

[10] For example, among single mothers, only 22 percent of those with a usual hourly wage over $10 work less than 1900 hours per year (conditional on working), but 44 percent of single mothers with a wage under $10 work less than 1900 hours per year.

[11] Note that the assumptions which led to (2.2) through (2.5) imply no selection, i.e. that the distribution of wages faced by those who work is the same one faced by those who do not work.

income single mothers. These complexities are described in detail in Section 4.

3. 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 Annual Demographic File and the merged Outgoing Rotation Group (ORG) data. In the CPS, a given household is interviewed for four consecutive months, not interviewed for eight months, and then interviewed for four more consecutive months, after which it permanently leaves the sample. 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, disaggregated earnings, and weeks worked during the previous year. The data from these March interviews is called the Annual Demographic File (March CPS). The ORG data come from all twelve months of the year and only include those in their fourth and eighth interviews. These data files allow one to use the full year of data without including the same person twice. Because the ORG includes one-fourth of the observations from each month, it has close to three times as many observations as the March CPS.

The March CPS data are from the 1985-1997 interviews, and therefore provide information on the years 1984-1996. The ORG data are from all twelve months during 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.

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.

4. 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.[12] For each policy or program, we first provide some brief background information and outline the major changes between 1984 and 1996 (see Figure 1 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 complex 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 (1999a).

4.1 The EITC and Federal and State Income Taxes

In recent years, the most important change for single mothers in the financial incentive to work has probably come from the Earned Income Tax Credit.[13] EITC credits increased fifteen-fold from $1.6 billion in 1984 to a projected $25.1 billion in 1996. Single mothers received about two thirds of these EITC dollars (U.S. House of Representatives, Green Book 1996, pp. 808-9).[14] In 1996 a single woman with two children who earned less than $8,890 (the phase-in range) received a 40 percent credit on dollars earned, up to a maximum of $3,556. 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

[12] We do not try to examine every government program that affects single women and their families. Other relevant programs we omit include public and subsidized housing, child support enforcement, food and nutrition programs other than Food Stamps, and Supplemental Security Income.

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

[14] Most of the remaining dollars are received by married taxpayers.

woman with two children earning between $5,000 and just under $19,000 received at least a $2,000 credit.

The current EITC is the result of several legislative changes (summarized in Figure 1) 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.[15] 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, $1,016 in 1995, $1,404 in 1996. Third, in 1991 the requirements for qualifying children were changed in a way that tended to increase eligibility. Fourth, the interaction of the EITC with other programs has changed over time. Most importantly, effective January 1991, the EITC was not counted as income in most means-tested programs, increasing its value for very low income women.

The post-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 post-tax incomes, we plot in Figure 2 the difference in take home pay (earnings minus federal income taxes plus the EITC) between a woman with two children and a woman with no children for various pre-tax earnings levels in 1984, 1988, 1992, and 1996.[16] We focus on the difference between a woman with two children and a

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[15] From 1991 through 1993 there were also small refundable credits for child health insurance premiums and for children under one. In 1993 (the last year of these credits), total credit received for child health insurance premiums were 0.46 billion dollars and for children under one were 0.76 billion dollars, while the value of the basic credit was 14.3 billion dollars (U.S. Department of the Treasury, SOI, 1994).

[16] Note that Figure 2 only illustrates differences in take home pay due to federal income taxes and the EITC. Other programs and work expenses, especially child care expenses, would need to be taken into account to fully characterize differences in take home pay between single women with and without children.

childless woman because this comparison is used in much of our empirical work.[17]

Figure 2 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 children) that ranged from $500 to $1,500.[18] Most of this increase was due to large increases in both the maximum credit and the earnings level before the credit phase-out began. Between 1988 and 1990, tax and EITC parameters were adjusted only for inflation, so the take home pay difference remained the same. Between 1990 and 1992, the moderate increase in the credit rate is evident.

The most striking feature of Figure 2 is the 1994-96 expansions, which dwarfed their predecessors, particularly for women with two or more children.[19] For example, the take home pay difference for women with $7,500 of earnings increased only about $600 between 1984 and 1993, but increased over $1,500 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.[20] 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

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[17] 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 1. The taxes paid by single women without children hardly changed between 1984 and 1996, especially for earnings levels between $10,000 and $20,000.

[18] Unless noted, all dollar amounts here are in 1996 PCE deflated dollars.

[19] Figure 2 does not incorporate the small credit, instituted beginning in 1994, available to taxpayers without qualifying children who were 25 and older. This credit is incorporated in the tax variable used in the empirical work below.

[20] Wisconsin used a slightly different rule, but only in 1994.

separate tax schedule for household heads. Quantitatively, these changes were less important than the introduction and expansion of state EITCs.

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 size and ages of children. The expectation is calculated by integrating over the wage and hours distribution of single women as described in Section 2. To illustrate the changes in the Income Taxes if Work variable over time, in Figure 3 we plot the difference in its mean for single women without children minus single mothers by year using the ORG data from 1984-1996.[21] Figure 3 illustrates that 39 percent of the $1,607 increase between 1984 and 1996 occurred in the last three years (1994-1996). About 43 percent occurred in 1987 and 1988, with 18 percent occurring between 1991 and 1993. Note that only the effects of the 1987 and 1988 increases have been examined in previous research (see Eissa and Liebman, 1996). Almost all of the increase in the tax difference was due to federal tax changes. Only $38 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 $221 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 post-credit 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. One might wonder if these income tax incentives for low income households were ineffective because households were unaware of the incentives or did not bother to file tax returns. However, EITC takeup appears to be high and rising.

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[21] Appendix Table 1 gives means for the Income Taxes if Work variable separately for single women with and without children in 1984, 1988, 1992, 1996.

Scholz (1990, 1994) estimates that 75 percent of EITC eligibles in 1988 and between 80 and 86 percent of EITC eligibles in 1990 received the credit. One of the reasons for this high takeup rate is the common use of paid tax preparers by low income women (Olson and Davis, 1994). With the increases in the EITC after 1990 which raised the value of filing and made more moderate income people who are likely to file eligible for the EITC, one might expect that the participation rate rose further. In addition, EITC awareness and outreach has increased in recent years.

4.2 AFDC and Food Stamps

The two programs that have been most commonly thought of as welfare are Aid to Families with Dependent Children (AFDC) and Food Stamps.[22] We discuss Food Stamps along with AFDC because nearly 90 percent of AFDC recipients also received Food Stamps (U.S. House of Representatives, Green Book, 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 inter-state 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 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, 15 states had exemptions and tax rates that differed from the standard $120 earnings exemption and the 2/3 implicit tax rate. We summarize

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[22] With the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), AFDC has been replaced by welfare block grants to states under the Temporary Assistance to Needy Families (TANF) program. Most states current welfare laws are closely related to the AFDC rules.

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.[23] Consequently, despite our best efforts, our calculations of AFDC benefits for those who work may be fairly rough. We will return to this issue in Section 5.

4.3 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 non-aged, non-disabled Medicaid recipients, a group which was predominately 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

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[23] Some research indicates that caseworker discretion leads actual practice to differ from statutory rules, at least as these rules are easily summarized (Fraker, Moffitt and Wolf, 1985; McKinnish, Sanders and Smith, 1997). Other research indicates that few AFDC recipients report their income to state welfare offices (Edin and Lein, 1997 and Edin and Jencks, 1993) or that state welfare offices systematically miscalculate benefits so that working women are cut off from receiving them (Levine, 1997). Consistent with this research, monthly administrative data from fiscal year 1996 suggest that only 11 percent of AFDC families report any earned income (U.S. Department of Health and Human Services, AFDC Characteristics, 1996). Note that our welfare variables assume that an individual maintains the same monthly earnings throughout the year and ignore changes in exemptions and implicit tax rates that occur after the fourth month of work.

eligibility has expanded dramatically since 1984, resulting in a more than three-fold 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.[24] In a series of expansions, Medicaid coverage was extended to low income pregnant women and children (again see Figure 1). Beginning in April 1987, states were *permitted* to extend Medicaid coverage to children under age two in families with incomes below 100 percent of the federal poverty line.[25] Subsequently, Medicaid coverage was extended to older children and those in higher income families. In October of 1988, states were *permitted* to cover children under age one in families below 185 percent of the poverty line. Later legislation often replaced state options with state requirements. Hence, since April 1990, states have been *required* to cover all children under six living in families with incomes below 133 percent of the poverty line and since July 1991 all children under nineteen (and born after September 1983) with family incomes below 100 percent of the poverty line. This last provision expands the coverage of poor children each year to those one year older so that in the year 2000 even 17-year-olds will be covered if their family income is below the poverty line.

These rules describe what can be done with Medicaid dollars that are matched by the federal government. Some states expanded medical coverage for children and sometimes adults with their own funds. Furthermore, 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.

We measure Medicaid benefits by first calculating the number of adults and children in the

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[24] Exceptions were families with very large medical expenses (through the Medically Needy Program), those receiving Supplemental Security Income (SSI), and those leaving AFDC and receiving transitional Medicaid. Some states also allowed those with incomes below the AFDC cutoff but not on the program to receive Medicaid (Blank, 1989).

[25] Medicaid expansions covering children under one typically cover pregnant women for services related to the pregnancy.

family that would be covered if a woman works.[26] We then convert these numbers to dollar values using Medicaid expenditures per child and adult averaged over all states and years.[27] We also examine the analogous variable with state/year specific values of expenditures obtained by smoothing the state time-series and indexing using the medical care CPI. As can be seen in Table 1, 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 unambiguously 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.

4.4 AFDC Program Waivers

Under Section 1115 of the Social Security Act, the Secretary of Health and Human Services (HHS) was authorized to waive specified program requirements to allow states to experiment with program changes that are judged to promote the objectives of AFDC. This waiver authority had been rarely used prior to the late 1980s, but its use accelerated during the Bush administration and continued under President 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

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[26] Note that this variable does not capture transitional Medicaid for women who lose AFDC benefits due to the loss of earnings disregards (effective October 1984) or increased earnings (effective April 1990).

[27] In the main specifications, Medicaid coverage for the non-working is colinear with family size and number of children controls, so α_3 is not estimated.

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 which 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 which applied for a major state-wide 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 1 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.

4.5 Training 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. During the 1980s, the AFDC training program was the Work Incentives (WIN) program. WIN expenditures fell substantially over the early part of our period from $259 million in 1984 to $93 million in 1988. In 1988 the Family Support Act was passed which established a new employment, education, and training program called JOBS (Job Opportunities and Basic Skills Training Program), which began in some states in 1989 and others in 1990. Expenditures quickly rose and were already $804 million in 1991.

WIN and JOBS differed in two key respects. First, JOBS exempted fewer women from work

or training requirements. Second, JOBS included high school and post-secondary education, though JOBS also seems to have had a greater emphasis on building job skills and readying people for work. The relative emphasis on particular components of training differ greatly across states and over time. 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 other, where the other category is mostly job search and related activities. 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.

State-level training expenditures under a certain amount (or cap) were matched by the federal government using a modified Medicaid match rate, which was inversely related to the state's per capita income. This cap was partially determined by the number of AFDC recipients in a state. Since AFDC receipt and employment are negatively correlated, one could be concerned about the endogeneity of these training variables. There are several things that make this issue less of a concern here.[28] First, most states do not spend up to the cap, one potentially endogenous part of the training expenditures formula. Second, the Medicaid matching rate varies a fair amount across states and over time (from 50 to 83 percent). Lastly, we calculate expenditures per AFDC mandatory participant to eliminate any dependence on the number of participants.

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 and/or

[28] Our conversations with HHS officials have made us less concerned about the potential endogeneity of the training variables. On the other hand, these conversations have suggested that focusing on these federal dollars misses many state training programs that affected single mothers as well as other federal programs such as JTPA.

employment, secondary or post-secondary 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.[29]

4.6 Child Care

The cost and quality of child care is likely to have an important effect on whether a woman works. A large number of federal and state programs affect the availability and cost of child care.[30] Several federal programs such as the Dependent Care Tax Credit and Title XX Social Services Block Grants have been existence for decades, though have declined in importance in recent years. Another program, Head Start, has not declined in expenditures or enrollment, but is usually part day and serves 3 and 4 year-olds almost exclusively.

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. Total expenditures on these four new federal programs by state and year are scaled by the number of single women in a state with children under 6. These numbers can be seen in Table 1 which shows a steep rise in child care expenditures between 1988 and 1992, followed by a slower rise in later years.

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[29] See Gueron and Pauly (1991) and U.S. Department of Health and Human Services (1997) for comparisons of job training programs that emphasize job search (sometimes called the labor force attachment approach) and those that emphasize education (sometimes called the human capital development approach). If mandatory training is viewed by some women as an additional cost of AFDC participation, then more extensive training and tighter requirements could also encourage work rather than AFDC participation. We should note that the opposite is also possible, i.e. if the training is thought to be valuable and is provided free to AFDC participants, then welfare participation could rise (Moffitt, 1992).

[30] The Congressional Research Service identified 46 programs operating in 1994 that were related to child care (U.S. House of Representatives, Green Book, 1996, p. 640). Most of the programs were small; 32 of the 46 provided less than $50 million in annual funding.

As with training expenditures, we are concerned about the potential endogeneity of child care dollars. AFDC and Transitional Child Care expenditures were not capped and were matched at the Medicaid matching rate (which is inversely related to state per capita income). State allocations for At-Risk Child Care were proportional to the number of children under age 13 in the state. The federal share of these expenditures was also based on the Medicaid matching rate. Funds for Child Care and Development Block Grants were allocated to states based on their proportion of children under age 5, their number of children receiving free or reduced-price school lunches, and state per capita income.[31]

5. 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. The methods rely on comparisons between single mothers and single women without children, or they rely on changes for some groups of single mothers relative to other groups. We begin with the familiar difference in differences estimator. This approach compares employment rates over time for single mothers to those for single women without children. If the two rates diverge, the difference is taken to be due to changes in the policies faced by the two groups. This approach is the one taken by Eissa and Liebman (1996) in their study of the EITC over the 1984 to 1990 period.

We then move on to our main approach that uses our structural model to distinguish between the different policies and to provide estimates that have a clearer interpretation. This approach uses a variety of sources of variation in our key explanatory variables besides time. In some estimates, the identifying variation comes from differences in taxes and benefits for families of different sizes as well as changes in these taxes and benefits over time and differences in state living costs. In other estimates, the identifying variation is differences across states in their taxes and benefits, as well as changes over time in these taxes and benefits. We also briefly consider estimates that use differences in wages and hours across different groups interacted with the other sources of variation.

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[31] As with training expenditures, our conversations with HHS officials made us less worried about the potential endogeneity of federal dollars and more worried about the omission of state child care programs.

5.1 Employment Rates of Single Mothers and Single Childless Women

As a starting point, we compare the employment rates of single mothers and single women without children. Table 2 reports the employment rates of single mothers and single women without children, along with the difference in employment rates between these two groups of women. We report this difference because many determinants of employment that change over time, especially wages, might be expected to affect the two groups similarly. Other determinants of employment, particularly the tax and transfer programs that we examine, specifically affect single mothers. The top panel of Table 2 compares all single mothers to single childless women. The bottom panel compares single mothers with children under 6 to single childless women. We pay particular attention to this subsample with young children for two reasons. First, we expect this group to be more responsive to changes in the rewards to work. Second, 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 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 work force on the margin, work few weeks during the year. On the other hand, as discussed earlier, the EITC unequivocally increases the probability of working 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 2 exhibit a striking time pattern. In the ORG sample, weekly employment increased by almost six percentage points for single mothers between 1984 and

1996, but declined by nearly one percentage point for single women without children. For women with young children the increase in employment is even larger: ten percentage points. In the March CPS, annual employment rose by over eight and one-half percentage points for single mothers, but declined by a full percentage point for single women without children over the same time period. Again, for women with young children the increase in employment is even larger: thirteen and one-half percentage points. Furthermore, nearly all of the increase in employment for single mothers took place between 1991 and 1996. These results suggest that the rising employment of single mothers was not a result of better work opportunities for all women, since single women without children had slight declines in employment. Moreover, the timing of the increase in employment suggests that policy changes in the 1990s are likely to have played a role.

5.2 Characteristics of Single Mothers and Single Childless Women

The results in Table 2 rely on the comparability of single women with and without children. In this section we briefly report on some of the characteristics of these two groups. Appendix Tables 1 and 2 report descriptive statistics for single women with and without children. Appendix Table 1 reports characteristics of the ORG sample for each of four years, 1984, 1988, 1992, and 1996. Appendix Table 2 reports a slightly different set of descriptive statistics including earnings and hours measures using both the March and ORG samples. This table can also be used to compare the two CPS samples. The tables indicate 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.

We should note that this table suggests that single women with and without children are similar in an important dimension: wages. The mean earnings of women with and without children are fairly similar once one conditions on working last year (they are much closer if one controls for education also). The means for wages are even closer. This similarity is especially important for some of the

estimates in Table 6 where we use the joint hours and wage distribution of single women without children as a proxy for the joint hours and wage distribution of single women with children.

5.3 Accounting for Individual and State Characteristics

The results in Table 2 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 3 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:

$$(5.1) \quad \text{Prob}(E_{it} = 1) = \Phi\{\alpha X_{it} + \beta_t \text{YEAR}_t + \gamma_t(\text{YEAR}_t * \text{ANYCHILDREN}_i)\},$$

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 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.[32] These differences can be interpreted as estimates of the combined effect of changes in all factors affecting the employment of single women with children relative to those without children.

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[32] Note that standard errors for these differences in differences cannot be directly calculated from Table 3 since they require covariances that are not reported. For successive years, which share approximately half of their samples, we would expect covariances to be positive. Hence, the standard error for the *difference* between successive years should be smaller than the standard error calculated under an independence assumption. For sample years that are more than one year apart, covariances are likely to be small.

The demographic and business cycle variables included in Table 3 include controls for state, race, ethnicity, age, education, 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. For comparison, Table 3 also reports probit estimates without the control variables X. As can be seen in this table, the differences in differences calculated by subtracting one YEAR*ANYCHILDREN coefficient from another are hardly affected by including the controls.[33] For example, between 1984 and 1996 the weekly employment of single mothers relative to single women without children rises 5.4 percentage points without controls and 5.9 percentage points with controls. For annual employment, the difference in differences estimator for 1984 to 1996 suggests a 7.1 percentage point increase in the relative annual employment of single mothers without controls and 7.3 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.

5.4 Policy Variables and Employment Using the Structural Model

Table 4 reports estimates of our structural model of the effects of tax and welfare policy on the probability that a woman works. These specifications provide estimates of the parameters in expression (2.5) of Section 2, and can be used to obtain estimates of the effects of the different policy changes during the 1984-96 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. The

[33] Due to the difficulty in gauging the magnitude of probit coefficient estimates, instead we report average derivatives of the probability of working with respect to each of the explanatory variables. 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 2.

specifications in Table 4 include all single women and use two earnings distributions, one for single mothers and another for single women without children, though neither distribution varies across individuals within these groups. In addition to the variables shown in Table 4, each of these probits include the control variables reported in Table 3 (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 structural model and are significantly different from zero.[34] Lower taxes and lower 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/non-work 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 we expect. 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.

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 2.3 percentage points, and increases employment last year by 2.9 percentage points. Both of these effects are strongly significant. These coefficients indicate elasticities of the participation rate with respect to the return to work of 0.69 for

[34] 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.

any employment during the year and 0.70 for work in an average week.[35] We also estimated specifications with separate coefficients on state and federal income taxes, though 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 states income taxes was a large and significant -0.0286 (0.0073) in the ORG sample and a small and insignificant -0.0100 (0.0090) 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. In an alternative specification we use the one year lagged tax variable instead of the contemporaneous tax variable to test the hypothesis that women learn about tax changes one year after they are implemented. The results are somewhat supportive of this hypothesis. The coefficient on the tax variable rises to -0.0269 and -0.0311 for work last week and last year, respectively, while the other coefficients hardly change.

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 2.9 percentage points, and increases employment last year by 1.9 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 6.6 percentage points and last year by 3.6 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. The magnitude of

[35] These elasticities are calculated using the participation rates and average pre-tax earnings of Appendix Table 2, i.e. (0.0287/0.759)/(1,000/18,165)=0.69 and (0.0230/0.600)/(1,000/18,165)=0.70.

this coefficient can be gauged by comparing it to 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 $2,647, while the March sample implies an estimate of $3,244.[36] 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 ten 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 4, 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 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

[36] These are calculated as 0.1734/0.0655 and 0.1158/0.0357, in the ORG and March samples, respectively.

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.

MEDICAID

We find little effect of Medicaid on the employment decisions of single mothers. Theory predicts that the Medicaid Coverage if Work variable will have a positive effect on employment. The variable has the opposite effect from this prediction in both samples, though the coefficient estimates are small and 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. Valuing the offer of Medicaid coverage is not straightforward, because it depends on the likelihood of private coverage for working women, which may vary systematically across individuals. The likely effect of the Medicaid expansions on employment is diminished by incomplete participation and the displacement of private coverage (Cutler and Gruber, 1996). Furthermore, Medicaid's value also depends on the availability of free clinics and emergency room treatment. We have tried a large number of alternative specifications, none of which indicates a large effect of Medicaid. These alternatives include specifications that account for predicted private coverage, that measure Medicaid by the number of family members covered, that separate out the Medicaid expansions from changes in AFDC rules, and that use methods close to those of Yelowitz (1995). A full accounting of these results can be found in Meyer and Rosenbaum (1999b).

WELFARE WAIVERS

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 1.2 and 3.2 percentage points. However, until the last years of our sample the overall importance of such waivers is small. Even by 1994, only five percent of single mothers lived in

states with a time limit, and less than half of one 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 and the attitudes of case workers 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. Predicting the effect of a particular waiver in a particular state based on the reported coefficients is also problematic since the publicity, provisions, and implementation of the waivers characterized as "time limits" varied greatly across 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.

TRAINING AND CHILD CARE

The last three coefficient estimates in Table 4 measure the effects of expenditures on training and child care. Training expenditures on education have a negative effect that is significant in both samples. This result could be due to women being drawn out of employment by training, with only a modest subsequent effect of training on the probability of employment. On the other hand, other

training, which mainly includes activities designed to lead to immediate employment such as job search, has the positive and significant coefficient in both samples that is expected given the literature on job search programs for the welfare population. The coefficients imply that an increase in expenditures of one thousand dollars per training mandatory AFDC recipient (about two-thirds of average expenditures) would increase in the rate of employment for single mothers without young children of over three 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 1.5 percentage points. However, these estimates would be biased if states spend more on job search programs and less on education programs when employment opportunities are good for former welfare recipients. If the two training variables are combined, the resulting coefficient is positive but insignificant in both samples.

The last coefficient of Table 4 indicates that higher expenditures on child care are associated with a higher employment rate for single mothers. 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 a 0.9 percentage point increase in employment in a given week and 0.7 percentage point increase in any employment during the year. These effects are quite substantial per dollar expended. The main sources of variation in child care expenditures are the changes in federal expenditures interacted with state/year characteristics, specifically the number of young children, per capita income, and the poverty rate. These sources of variation suggest that the child care variable is plausibly exogenous. Nevertheless, further exploration of the determinants of program expenditures would be useful.

RESULTS BY EDUCATION GROUP

Table 4 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 for high school dropouts, less of an effect for those with a high school degree, and even

less of an effect for those with some college.[37] Overall, the results by level of education provide a very similar message to those for the full sample. 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 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 4.5 percentage points in a typical week and increase work at all during the year by 8.6 percentage points. The corresponding numbers for those with some college education are 1.4 percentage points and 1.1 percentage points. Many of the other policy variable derivatives also fall with increased education.

It might be expected that the derivatives would be lower for groups with higher levels of education, since their employment rates are higher, leaving less room for increases in employment. However, it appears that 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.[38] This finding suggests that the greater responsiveness of the less educated groups to the policies reflects true differences between the groups, rather than an effect of lower employment rates.

ALTERNATIVE ESTIMATES

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 re-estimate the full sample specifications of Table 4, 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 Table 5, are very close to those over the full sample period. The only exception to this generalization is that the other training coefficient is larger and the child care coefficient is smaller and statistically insignificant over the shorter time span. These results clearly indicate that the flurry of welfare reform measures after 1993 have not falsely led to our main results. This specification also indicates that the extended recovery of

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[37] 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.

[38] The probit functional form assumption seems to be reasonable for employment as the coefficients do not vary much with education even though the employment rate varies substantially.

the 1990s is not an explanation for our main results.

In the next three specifications of Table 5, we interact year and/or state with indicator variables for the presence of children.[39] These specifications identify the effects of the income variables through variation over time across states and family sizes. In these specifications, children interactions with year do not have a large effect on the coefficients. On the other hand, children interactions with state do appreciably reduce the magnitude and significance of many of the income and welfare coefficients. The welfare variables are particularly sensitive to the inclusion of interactions between children and state.

In Table 6 we examine four additional specifications. First, we examine a sample of only single mothers. This sample restriction, combined with our continued inclusion of state and year dummy variables implies an identification strategy similar to some of the Table 5 specifications. 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.[40] 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. In columns (1) and (5) the standard errors, particularly on the income tax variable, are much larger. The earnings variables tend to have smaller coefficients and much weaker effects. The tax coefficient is no longer significantly different from zero in the ORG sample, but remains significant in the March CPS data. The welfare benefit coefficients are now no longer significant. The AFDC transaction cost coefficient, however, remains

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[39] We include separate indicator variables for AFDC eligible children (under 18) and EITC eligible children (under 19 or under 24 but in school).

[40] An additional, though smaller, source of variation among single mothers comes from the $1,058 (1996 dollars) increase in the personal exemption in 1987.

significant in the ORG data, while the Medicaid coefficient has the expected sign, but remains small and insignificant in both samples.

In our second and third specifications of Table 6, we split the sample by the age of the youngest child. To begin assessing the overall social welfare effects of some of the policy changes we study, we need to determine if the policies affect the extent of parental care children receive. Since parental care is likely to be especially important for young children who are not in school, we split the sample into those families with a child under six, and those with only older children. The derivative estimates are often substantially larger in magnitude for families with young children. This difference is particularly apparent for the tax variable in the ORG sample.

The last specification of Table 6 brings in additional variation in the income variables by interacting them with differences in the earnings potential of individuals. We allow the wage/hours distribution for women to depend on full interactions of indicator variables for age, education, race and region. We use the distribution for single women without children rather than the distribution for single mothers to avoid any direct endogeneity from the groups whose employment we study. The sources of variation in the income variables are now those used in our main specifications interacted with the earnings differences across the 90 groups, controlling for the main effects of the 90 groups. The results differ from those in Table 4 as the income tax effects are weaker, though still negative, substantial and significantly different from zero. The welfare coefficients fall slightly and most other variables have similar effects.[41]

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[41] Unlike the earlier estimates, the results of columns (4) and (8) of Table 6 are heavily dependent on the linear utility assumption. In the earlier estimation methods we were not using differences in earnings levels to identify the effects of welfare and taxes, rather we used how state and federal changes have affected a fixed earnings distribution. While misspecification of the utility function certainly could have biased the earlier results, the curvature of the utility function was not central in determining whether one policy was more generous than another. Now this issue is more important. To give an example, we must explicitly determine whether $500 in taxes has a smaller effect on employment for someone who would earn $10,000 than $1000 does for someone who would earn $25,000. We currently make the strong assumption that the effect in the former case is one-half of that in the latter. This assumption is likely violated here, and moreover, this assumption is important in this case because comparisons like those in the example are what drive identification in these last estimates. This issue is particularly important for the tax variable since it is not monotonic in income, unlike the welfare and Medicaid variables. For example, the EITC payment is about $2000 for a woman with two children in 1996 who earned either

6. Alternative Explanations and Additional Specifications

THE CPS REDESIGN

One caveat 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.[42] We assess the extent of any bias due to the redesign using two methods. First, we take advantage of the fact that in the March CPS reports retrospective employment information, so the redesign first affects the 1993 employment rates. Conversely, for the contemporaneous employment information used in the ORG, the redesign first affects the 1994 rates. We compare the seam in each of these two datasets to unbroken data from the other dataset to provide an estimate of the bias due to the redesign.[43] Note that we focus on the difference in differences, i.e. the one year change in the employment rate for single mothers minus the change for single women without children.

In Table 7, we compare the 1993-1992 March CPS difference in differences (single mothers minus single women without children) that spans the redesign to that in the unbroken ORG data. This comparison suggests that the redesign has led to an understatement of the increase in single mothers' employment in the March CPS, but the bias is small and insignificant. Similarly, we compare the 1994-1993 ORG difference in differences which spans the redesign to that in the unbroken March CPS data. This comparison suggests that the redesign has led to a substantial understatement of the increase in single mothers' employment in the ORG, though the bias estimate is only marginally significant. Since the changes due to the redesign mostly affected questions from the monthly questionnaire (the basis for

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$5,000 or $19,000. In other work that we do not report here, we have relaxed our assumption of linear utility for the main specifications of Table 4 and found similar derivatives.

[42] For a description of this CPS redesign, see Cohany, Polivka, and Rothgeb (1994), and Polivka and Miller (1998).

[43] One caution regarding this procedure is that the March CPS measures annual employment, while the ORG records weekly employment. However, Table 2 indicates that year to year changes in the two surveys tend to be in the same direction and of a similar magnitude, though the March CPS changes tend to be slightly larger.

the ORG data) rather than those from the supplemental questionnaires (the basis for the March CPS data), it is not surprising that the effects are larger in the ORG.

The second method of estimating the redesign bias exploits the parallel survey of 12,000 households that was conducted using the new collection procedures and questionnaire between July 1992 and December 1993. Table 8 reports comparisons of the difference in differences (single mothers minus single women without children) in the parallel survey to those in the ORG. These estimates suggest a small but insignificant positive bias in the ORG due to the redesign. Hence, this analysis suggests that the redesign resulted in a small *overstatement* of the increase in employment of single mothers in the ORG.[44] Overall, these comparisons indicate that the CPS redesign is not the source of the recent employment increases of single mothers.[45]

ARE SINGLE MOTHERS A GOOD COMPARISON GROUP?

A potential criticism of our results in Table 4 (and some of those in Tables 5 and 6) is that single women without children are not a good comparison group for single mothers. In particular, it might be argued 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. This argument is not compelling because 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, our derivative estimates for the policy variables tend to be the largest and most statistically significant for this group. In addition, this issue of "ceiling effects" is really one of functional form. A probit model naturally forces the marginal effects of all variables to

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[44] The ORG/ADF difference from the parallel survey may be due to differences between the parallel survey and the regular CPS. In particular, the parallel survey interviewers had lower caseloads, and the interviews were longer and were supervised more carefully.

[45] A final source of evidence is the SIPP employment rate change between 1993 and 1994 reported in Liebman (1998). He finds that employment rose 4.5 percentage points over this period. The comparable change in the ORG was 1.8 percentage points, again suggesting that the ORG understates the rise in single mothers employment.

be smaller in the tails as probabilities approach zero or one. On the other hand, the probit functional form may not be the right one, or the linear, additive argument of the probit function may be inappropriate.[46]

One might also wonder if the large increases in employment that we find for single mothers, but not for single childless women, also occur for other demographic groups. We examine whether there are similar employment increases for two other groups with historically low employment rates: black males 19-44 and married women 19-44. We obtain weekly employment from our ORG data over the 1984-96 period, and annual employment over the 1967-96 period from our ADF data. For black males there is no change in either annual or weekly employment rates between 1991 and 1996, the period when single mothers' employment experiences most of its rise. Over a longer time period, there is a very small rise in black male employment between 1984 and 1996, but the entire increase occurs by 1985. For married women, there is a small increase in employment between 1991 and 1996, but the increase is much smaller than in previous periods of that length. This pattern is evident in both the annual and weekly employment data. Thus, the large increases in employment of single mothers over 1984-96 and particularly since 1991-96 are not mirrored by other groups.

Another potential criticism 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 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. The aggregate data on single motherhood are

[46] One could consider alternative assumptions using other functional forms or semiparametric estimation.

similarly inconclusive. During the 1990s the rate of increase in the fraction of women 19-44 who are single mothers slowed, thereby providing no hint that the large recent increases in work by single mothers are due to working women changing their fertility or marriage behavior. However, there is no strong evidence here to the contrary, since the appropriate counterfactual rate of single motherhood is unclear. Overall, it is likely that endogenous single motherhood and location exert a small bias on our results.

ADDITIONAL SPECIFICATIONS

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 if 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 fifty 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 examine a specification where we do not adjust the income variables for state cost of living differences. This modification reduces the magnitude and the significance of the income tax coefficients, though the change is only large in the ORG data. We try samples that include separated women and samples that include women in school. The results in these samples using the March ADF or ORG data are extremely close to those in our base samples, but yield a slightly larger tax coefficient. We also try a more stringent definition of employment. In the case of hours last week, we require at least 10 hours, and in the case of hours last year, at least 500 hours. This change has little effect on the results; it tends to give slightly larger coefficients on the policy variables. These results suggest that the

increases in the employment of single mothers that we find are not simply due to women who are working a few hours a week in order to satisfy AFDC work requirements. Moreover, this alternative definition (and the resulting lower employment rates) are also further support for the conclusion that "ceiling effects" are not the explanation for our results.

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. For most other variables, we do not find large differences between these groups nor any consistent patterns to the direction of the differences.

7. Determinants of Hours

So far, we have examined whether a woman worked at all in a year and whether she worked in a typical week. These variables capture the decision to work as well as the decision of how many weeks to work. To obtain a full picture of the effects of welfare and tax policy on labor supply, in this section we examine the determinants of hours worked. Hours worked is also of interest because some of the policy changes we examine, especially the EITC changes, are predicted to reduce annual hours among the working. We examine hours worked per week using the ORG data and hours worked per year using the ADF data. Table 9 provides mean values of these hours measures for single mothers and single women without children for the years 1984-1996. The numbers reported in this table are weekly hours worked not conditioning on hours being positive. Difference in differences estimates calculated from these numbers again show large relative increases in work for single mothers over the sample period, with almost all of the change occurring after 1991.

We estimate 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 4 through 6, though we should emphasize that these variables were constructed for our structural model of employment, so are less suitable for an analysis of hours. A structural model of hours worked is beyond the scope of this paper. The first four columns of Table 10

report Tobit estimates including women whether or not they work. The last four columns report OLS estimates from the sample of working women with positive hours. We report estimates for hours worked over the entire year/52 from the ADF, and hours worked in a typical week from the ORG. We also report estimates using the sample of single women, as well as those from the subsample of single mothers. 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. Decreases in income taxes (or increases in the EITC) and cuts in the maximum welfare benefit increase hours worked. Increases in AFDC for those who work as well as time limits, job search assistance, and child care increase hours worked. 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/52 in the ADF and hours in a typical week in the ORG, with the exception of Medicaid if Work which has a positive and significant effect for single mothers annual hours. For hours worked conditioning on positive hours, the policy variables tend to have much the same signs, but smaller and less significant coefficients. There are some notable sign reversals for conditional hours, as the education component of training becomes positive in both samples, while Child Care becomes negative in the ORG. In most cases, the conditional hours derivatives are much smaller than those on unconditional hours. Overall, the results tend to confirm the results for the main policy variables that we found in the employment probits.

8. 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 11 we decompose the employment increases 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, 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 (Specification (1) and (5) of Table 4), the EITC explains 63 percent of the increase in weekly employment over the full 1984 to 1996

period, yet only 37 percent of the increase between 1992 and 1996. For annual employment, the EITC plays a very similar role, explaining 63 percent of the 1984 to 1996 increase and 34 percent of the 1992 to 1996 increase.

Changes in the maximum welfare benefit and implicit tax rates and the Medicaid expansions account for between 17 and 27 percent of the increase in weekly employment and between 10 and 14 percent of the increase in annual employment over either period. The effect of the Medicaid expansions themselves is usually small and/or negative. Conversely, the effects of welfare waivers appear to be substantial, with the estimates suggesting that policies instituted under waivers account for about one sixth of the increase in employment over the full sample period and about 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, though in the case of weekly employment over the full period child care can account for over 9 percent of the increase.

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 (1) and (5) of Table 6). These results suggest a much smaller role (compared to Table 11) for the EITC in explaining the changes in weekly employment, but a similar role in explaining changes in annual employment. Changes in the maximum welfare benefit are less important, while the results for welfare waivers, job training, and child care are largely unchanged.

9. Conclusions

Between 1984 and 1996, there were enormous changes in many of the tax and transfer programs that affect single mothers. The Earned Income Tax Credit was expanded, welfare benefits were cut, welfare time limits were added and cases were terminated, Medicaid for the working poor was expanded, training programs were redirected, and subsidized or free child care was expanded. All of these changes would be expected to encourage single mothers to work.

The trends in employment of single mothers compared to single women without children, as well as married mothers, or black men, suggest that single mothers have responded to these incentives

by working more, especially after 1991 and especially mothers with children under six. To assess which policies have led to the employment increases, we examine in great detail the incentives of the programs mentioned in the previous paragraph as well as other federal and state income tax provisions, Food Stamps, and the implicit tax rates and earnings disregards under AFDC. We estimate the effects of these programs using two large micro-datasets. The estimates imply that the EITC accounts for over sixty percent of the increase in the weekly and annual employment of single mothers between 1984 and 1996. Welfare waivers appear to account for about one-sixth of the increase for both employment measures. Other changes in AFDC can account for about one-quarter of the weekly employment increase and about one-eighth of the annual increase. Changes in Medicaid, training, and child care programs play a smaller role. These results are confirmed in an analysis of hours worked.

This paper makes several methodological improvements over past work, including the estimation of a structural model of employment which provides several independent tests of the hypothesis that single mothers respond to economic incentives. Unlike most past work which has analyzed one or two programs in isolation, we examine the major programs affecting single mothers. We rely on less subjective measures of welfare waivers such as implementation dates and the beginning of case terminations. We also provide the first evidence on the effects of waivers on employment. Identification in most of our estimates comes from the differences in incentives faced by women with and without children. However, we also 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. Most of the evidence remains when we focus only on changes in the incentives faced by one group of single mothers compared to another. We also provide evidence that single women without children are a reasonable comparison group for single mothers.

There appears to be a payoff to some of the methodological improvements. We find that examining one or two programs in isolation can lead to large biases in estimated behavioral effects. Our results indicate that financial incentives through the tax and welfare systems have powerful effects on single mothers' employment decisions and that the different sources of these incentives have effects of

plausible magnitudes. We find substantial responses to state and federal income taxes, welfare benefits, and implicit tax rates and earnings disregards under welfare. We find a sizable transaction cost or stigma to welfare. We also find significant effects of training and child care programs, but little effect of Medicaid. Overall, this paper indicates that work can be encouraged by making work more attractive as well as by making welfare less attractive.

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. 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.
2. Children under 18 are counted as AFDC children.
3. Children under 19 (or under 24 and students) are counted as dependents and EITC qualifying children for tax purposes.
4. 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.
5. 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.
6. Women receiving AFDC are in their first four months of work and do not claim child care expenses.[47]
7. Single women without children do not receive Food Stamps.
8. 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 fifty annual earnings levels generated from the cells of a joint wage/hours distribution. The fifty 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 two different wage/hours distributions to weight the above quantities, both of which allow dependence between hours and wages and do not vary over time. Our main specifications use a wage/hours distribution calculated from the full sample of single women with more than $500 of annual earnings. The sample is only split by whether or not a woman has children. Our second

[47] 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% of AFDC families with earnings claimed child care expenses (U.S. Department of Health and Human Services, AFDC Characteristics, 1996).

wage/hours distribution is calculated within 90 cells defined by full interactions of region (5),[48] age (19-24, 25-34, 35-44), education (<12, 12, >12), and race (white and non-Hispanic, nonwhite or Hispanic) using a sample of single childless women with more than $500 of annual earnings.

Using these wage/hours distributions, we construct the following variables.

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. A variant uses state/year specific expenditure figures.

Using the welfare data, we also calculate the following variables.

Welfare Maximum Benefit is the *welfare benefit* assuming zero earnings.

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

(A.1) 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:

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

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[48] Region 1 includes ME, NH, VT, MA, RI, CT, NY, NJ, DE, MD, and DC. Region 2 includes PA, OH, IN, IL, MI, WI, and MN. Region 3 includes VA, NC, GA, FL, and TX. Region 4 includes CO, AZ, NV, WA, CA, AK, and HI. Region 5 includes SC, WV, KY, TN, AL, MS, LA, AR, MO, IA, NE, KS, ND, SD, OK, NM, UT, MT, ID, WY, and OR.

Second, we calculate the monthly Food Stamp benefit:

(A.3) 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),
FS is the monthly Food Stamp benefit,
MB is the maximum Food Stamp benefit,
SD is the standard deduction,
SE is shelter expenses,
SED is the shelter expense deduction, and
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 we then adjust annually using the PCE deflator. The poverty threshold index accounts for housing cost differences between states using Census housing cost data. Medicaid variables are adjusted annually using the Medical Care CPI.

Sources for Taxes, Welfare, and Medicaid:

We obtain the federal income tax schedules from the U.S. Department of the Treasury (Tax Guide, 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 (AFDC 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 (Food Stamps, various years). The Medicaid program information is obtained from three sources: the National Governor's Association (MCH Update, various dates), the Intergovernmental Health Policy Project (Medicaid Changes, various years), and the U.S. House of Representatives (Medicaid Source Book, 1988 and 1993). Medicaid dollar values (separately for adults and children) come from unpublished tables from the Health Care Financing Administration (HCFA). Five-year moving averages are used to smooth these data which are indexed using the medical care CPI.

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 2 years).

Any Terminations is one beginning with the month in which a case is first terminated under a welfare waiver.

Extended Transitional Assistance is one starting with the implementation month of a waiver which

extends Medicaid coverage or child care benefits beyond the usual one year period for those leaving welfare for work.

Major Waiver Application is one beginning with the month in which a state first applies for a major state-wide waiver.

Note that these variable 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 (Baseline, 1997), 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 (Waiver Fact Sheet, 1997). Our classification scheme follows most closely the classification schemes in General Accounting Office (1997), the U.S. Department of Health and Human Services (Baseline, 1997).

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 that 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.[49]

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, post-secondary 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 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

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

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 (AFDC Characteristics, 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 under 6. 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 under 6, which is calculated from the ORG over the entire 1984-96 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 under 6.

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 comes from the U.S. Census Bureau. The fraction of women in a state who are unmarried with children under 6 is calculated from the ORG by the authors. Wage data come from the Bureau of Labor Statistics web site.

References

American Public Welfare Association (APWA, 1996). "Summary of Approved AFDC Waiver Actions." May 1993 and August 1, 1996.

Advisory Committee on Intergovernmental Relations (various years). *Significant Features of Fiscal Federalism*. Washington: various years.

Bavier, Richard (1999). "An early look at the effects of welfare reform" Unpublished Manuscript, March 1999.

Blank, Rebecca M. (1997). "What Causes Public Assistance Caseloads to Grow?" Unpublished Manuscript, May 1997.

____ (1989). "The Effect of Medical Need and Medicaid on AFDC Participation." *Journal of Human Resources*, Winter 1989, 24(1), pp. 54-87.

Blank, Rebecca M. and Patricia Ruggles (1996). "When Do Women Use Aid to Families with Dependent Children and Food Stamps?" *Journal of Human Resources*, Winter 1996, 31(1), pp. 57-89.

Browning, Edgar K. (1995). "Effects of the Earned Income Tax Credit on Income and Welfare." *National Tax Journal*, March 1995, 48(1), pp. 23-43.

Cohany, Sharon, Anne Polivka, and Jennifer Rothgeb (1994). "Revisions in the Current Population Survey Effective January 1994." *Employment and Earnings*, February 1994, 41(2), pp. 13-37.

Commerce Clearing House (various years). *State Tax Handbook*. Chicago: various years.

Council of Economic Advisers (1997). "The Economics of Child Care." December 1997.

Cutler, David M. and Jonathan Gruber (1996). "Does Public Insurance Crowd our Private Insurance," *Quarterly Journal of Economics*, May 1996, 112(2), pp. 391-430.

Danziger, Sheldon, Robert Haveman, and Robert Plotnick (1981). "How Income Transfers Affect Work, Savings, and the Income Distribution: A Critical Review." *Journal of Economic Literature*, September 1981, 19(3), pp. 975-1028.

Dickert, Stacy, Scott Houser, and John Karl Scholz (1995). "The Earned Income Tax Credit and Transfer Programs: A Study of Labor Market and Program Participation." In James M. Poterba, ed. *Tax Policy and the Economy* 9. Cambridge, MA: MIT Press, 1995, pp. 1-50.

Edin, Kathryn and Laura Lein (1997). *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work.* New York: Russell Sage Foundation, 1997.

Edin, Kathryn and Christopher Jencks (1993). "Reforming Welfare." In Christopher Jencks, ed. *Rethinking Social Policy: Race, Poverty, and the Underclass*. Cambridge, MA: Harvard University Press, 1993.

Eissa, Nada and Jeffrey B. Liebman (1996). "Labor Supply Response to the Earned Income Tax Credit." *Quarterly Journal of Economics*, May 1996, 112(2), pp. 605-637.

Eissa, Nada and Hilary Williamson Hoynes (1998). "The Earned Income Tax Credit and Labor Supply: Married Couples," NBER Working Paper No. 6856, December 1998.

Feenberg, Daniel and Elisabeth Coutts (1993). "An Introduction to the TAXSIM Model" *Journal of Policy Analysis and Management*, Winter 1993, 12(1), pp. 189-94.

Fraker, Thomas, Robert Moffitt and Douglas Wolf (1985). "Effective Tax Rates and Guarantees in the AFDC Program, 1967-1982" *Journal of Human Resources*, Spring 1985, 20(2), pp. 252-63.

General Accounting Office (GAO, 1997). "Welfare Reform: States' Early Experiences with Benefit Termination." Washington: GAO, S-97-74, May 1997.

Gueron, Judith M. and Edward Pauly (1991). *From Welfare to Work*. New York: Russell Sage Foundation, 1991.

Heckman, James J. (1993). "What Has Been Learned about Labor Supply in the Past Twenty Years?" American Economic Review, May 1993, 83(2), pp. 116-21.

Hoffman, Saul D. and Laurence S. Seidman (1990). *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 (1994). "Promoting Work Through the EITC." *National Tax Journal*, September 1994, 47(3), pp. 591-608.

Hoynes, Hilary (1997). "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 (Medicaid Changes, various years). *Major Changes in State Medicaid and Indigent Care Programs.* Washington: various years.

Katz, Lawrence F. (1997). "Wage Subsides for the Disadvantaged," in *Generation Jobs*, ed. by Richard B. Freeman and Peter Gottschalk New York: Russell Sage Foundation.

Keane, Michael and Robert Moffitt (1998). "A Structural Model of Multiple Program Participation and Labor Supply," *International Economic Review*, August 1998, 38, pp. 553-589.

Levine, Judith A. (1997). "Policy Incentives Confront Everyday Realities: Integrating Economic and Sociological Perspectives on the Welfare-to-Work Transition." Unpublished Manuscript, March 1997.

Levine, Phillip B. and Diane M. Whitmore (1998). "The Impact of Welfare Reform on the AFDC Caseload." Washington: National Tax Association Proceedings, Ninetieth Annual Conference, 1998.

Liebman, Jeffrey B. (1998). "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 (1997). "Explaining the Recent Decline in Welfare Caseloads: Is the Council of Economic Advisers Right?" *Challenge*, Nov.-Dec. 1997, 40(6), pp. 6-20.

McKinnish, Terra, Seth Sanders, and Jeffrey Smith (1997). "Estimates of Effective Guarantees and Tax Rates in the AFDC Program for the Post-OBRA Period" Unpublished Manuscript, April 1997.

Meyer, Bruce D. (1999). "Do the Poor Move to Receive Higher Welfare Benefits?," Unpublished Manuscript, April1999.

Meyer, Bruce D. and Dan T. Rosenbaum (1999a). "Making Single Mothers Work: Recent Changes in Tax and Welfare Policy and their Effects," Unpublished Manuscript, March 1999.

____ **(1999b).** "Medicaid, Private Health Insurance and the Labor Supply of Single Mothers," Unpublished Manuscript, July 1999.

Moffitt, Robert (1997). "The Effect of Welfare on Marriage and Fertility: What Do We Know and What Do We Need to Know?, Unpublished Manuscript, December 1997.

____ **(1992).** "Incentive Effects of the U.S. Welfare System." *Journal of Economic Literature*, March 1992, 30(1), pp. 1-61.

____ **(1992).** "Evaluation Methods for Program Entry Effects." In *Evaluating Welfare and Training Programs.* Charles F. Manski and Irwin Garfinkel, eds. Cambridge, MA: Harvard University Press, 1992.

____ **(1983).** "An Economic Model of Welfare Stigma." *American Economic Review*, December 1983, 75(3), pp. 1023-35.

Moffitt, Robert and Barbara Wolfe (1992). "The Effect of the Medicaid Program on Welfare Participation and Labor Supply." *Review of Economics and Statistics*, November 1992, 74(4), pp. 615-26.

National Governor's Association (MCH Update, various dates). *MCH (Maternal and Child Health) Update.* Washington: various dates.

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

Olson, Lynn M. and Audrey Davis (1994). "The Earned Income Tax Credit: Views from the Street Level." Institute for Policy Research (Northwestern University, Evanston, IL) Working Paper Series, 1994.

Polivka, Anne E. and Stephen M. Miller (1995). "The CPS After the Redesign: Refocusing the Economic Lens." In *Labor Statistics Measurement Issues*, John Haltiwanger, Marilyn E. Manser, and Robert Topel, ed., 249-286. University of Chicago Press.

Savner, Steve and Mark Greenberg (1997). "The CLASP Guide to Welfare Waivers, 1997" Washington: Center for Law and Social Policy, 1997.

Scholz, John Karl (1994). "The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness." *National Tax Journal*, 1994, pp. 59-81.

U.S. Department of Agriculture (Food Stamps, various years). *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 the Treasury (Tax Guide, various years). *Your Federal Income Tax: Tax Guide for Individuals*. Washington: U.S. Department of the Treasury, Internal Revenue Service, various years.

U.S. Department of Health and Human Services (AFDC Characteristics, various years) *Characteristics and Financial Circumstances of AFDC Recipients.* Washington: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Family Assistance, Division of Performance Measurement, various years.

____ **(AFDC Plans, various years).** *Characteristics of State Plans for Aid to Families with Dependent Children*. Washington: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Family Assistance, various years.

____ **(Baseline, 1997).** "Setting the Baseline: A Report on State Welfare Waivers." Washington: U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation,1997.

____ **(Waiver Fact Sheet, 1997).** *HHS Fact Sheet: State Welfare Demonstrations*. Washington: U.S. Department of Health and Human Services, March 17, 1997.

____ **(1997).** *National Evaluation of Welfare-to-Work Strategies*. Washington: Administration for Children and Families, Office of the Assistant Secretary for Planning and Evaluation, December 1997.

U.S. House of Representatives, Committee on Energy and Commerce (Medicaid Source Book, 1988 and 1993). *Medicaid Source Book: Background Data and Analysis*. Washington: Government Printing Office, November 1988 and January 1993.

U.S. House of Representatives, Committee on Ways and Means, (Green Book, various years). *Green Book, Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means*. Washington: Government Printing Office, various years.

Winkler, Anne (1991). "The Incentive Effects of Medicaid on Women's Labor Supply." *Journal of Human Resources*, Spring 1991, 26(2), pp. 308-37.

Yelowitz, Aaron S. (1995). "The Medicaid Notch, Labor Supply and Welfare Participation." *Quarterly Journal of Economics*, November 1995, 110(4), pp. 909-40.

Ziliak, James P., David N. Figlio, Elizabeth E. Davis, and Laura S. Connolly (1997). "Accounting for the Decline in AFDC Caseloads: Welfare Reform or Economic Growth?" Unpublished Manuscript, July 1997.

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Table 1
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 $5,000 Earnings	-169	352	-338	376	-533	408	-1,478	194
At $10,000 Earnings	124	954	-347	1,356	-673	1,427	-2,012	1,432
At $15,000 Earnings	1,599	2,075	784	2,589	502	2,687	-476	2,706
At $20,000 Earnings	2,721	3,325	2,477	3,844	2,374	3,980	1,686	4,009
At $30,000 Earnings	5,466	6,326	5,398	6,538	5,527	6,666	5,585	6,668
Annual AFDC and Food Stamp Benefits								
At $0 Earnings	7,583	0	7,406	0	7,391	0	7,056	0
At $5,000 Earnings	4,719	0	4,734	0	4,791	0	4,564	0
At $10,000 Earnings	1,871	0	1,885	0	2,029	0	1,975	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 $5,000 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
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
Extended Transitional Asst.	0.00	0	0.00	0	0.01	0	0.12	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 - Other	126	0	39	0	166	0	272	0
Child Care	0	0	0	0	246	0	302	0
Number of Observations	9,391	18,914	9,211	18,612	10,333	19,311	8,788	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, and 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.

Table 2
Employment Rates for Single Mothers, Single Mothers with Children under Six, and Single Women Without Children, 1984-1996

Year	CPS Outgoing Rotation Group, Worked Last Week = 1				March CPS, Worked Last Year = 1			
	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) and are weighted.

Restrictions: Both samples include 19-44 year-old single women (divorced, widowed, and never married) who are not in school. The March 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.

Table 3
Probit Employment Probability Estimates for Single Women, 1984-1996

	ORG, Worked Last Week = 1				March CPS, Worked Last Year =1			
	(1)		(2)		(3)		(4)	
Explanatory Variable	**Average Derivative**	**Standard Error**	**Average Derivative**	**Standard Error**	**Average Derivative**	**Standard Error**	**Average Derivative**	**Standard Error**
Any Children*1984	-0.1893	0.0052	-0.0695	0.0094	-0.1721	0.0066	-0.0704	0.0104
Any Children*1985	-0.1985	0.0051	-0.0747	0.0091	-0.1876	0.0068	-0.0776	0.0101
Any Children*1986	-0.2021	0.0051	-0.0748	0.0090	-0.1843	0.0067	-0.0740	0.0099
Any Children*1987	-0.2018	0.0051	-0.0768	0.0086	-0.1833	0.0068	-0.0684	0.0093
Any Children*1988	-0.1995	0.0053	-0.0730	0.0084	-0.1744	0.0072	-0.0594	0.0091
Any Children*1989	-0.1827	0.0053	-0.0579	0.0082	-0.1610	0.0066	-0.0482	0.0085
Any Children*1990	-0.1939	0.0051	-0.0687	0.0083	-0.1695	0.0066	-0.0538	0.0088
Any Children*1991	-0.1971	0.0050	-0.0718	0.0089	-0.1741	0.0064	-0.0593	0.0098
Any Children*1992	-0.1930	0.0050	-0.0652	0.0092	-0.1550	0.0063	-0.0457	0.0103
Any Children*1993	-0.1769	0.0050	-0.0524	0.0089	-0.1639	0.0066	-0.0537	0.0099
Any Children*1994	-0.1733	0.0051	-0.0469	0.0085	-0.1374	0.0067	-0.0251	0.0094
Any Children*1995	-0.1601	0.0052	-0.0354	0.0084	-0.1220	0.0071	-0.0100	0.0093
Any Children*1996	-0.1355	0.0055	-0.0106	0.0085	-0.1015	0.0071	0.0027	0.0090
Nonwhite	.	.	-0.0787	0.0017	.	.	-0.0471	0.0021
Hispanic	.	.	-0.0353	0.0026	.	.	-0.0393	0.0025
Age 19-24	.	.	-0.0183	0.0021	.	.	-0.0050	0.0027
Age 25-29	.	.	0.0061	0.0021	.	.	-0.0070	0.0026
Age 35-39	.	.	-0.0043	0.0023	.	.	0.0005	0.0029
Age 40-44	.	.	-0.0095	0.0024	.	.	0.0069	0.0032
High School Dropout	.	.	-0.1886	0.0019	.	.	-0.0978	0.0021
Some College	.	.	0.0760	0.0016	.	.	0.0640	0.0021
Bachelors	.	.	0.1258	0.0022	.	.	0.1136	0.0035
Masters	.	.	0.1130	0.0035	.	.	0.1247	0.0062
Divorced	.	.	-0.0060	0.0024	.	.	0.0040	0.0034
Widowed	.	.	-0.1048	0.0070	.	.	-0.0788	0.0075
Any Children*Divorced	.	.	0.1007	0.0033	.	.	0.0466	0.0041
Any Children*Widowed	.	.	0.0853	0.0084	.	.	0.0743	0.0088
# of Children under 18	.	.	-0.0353	0.0012	.	.	-0.0210	0.0013
# of Children under 6	.	.	-0.0834	0.0017	.	.	-0.0453	0.0017
Pregnant	.	.	.	.	.	.	-0.0863	0.0041
Unearned Income ($1000s)	.	.	.	.	.	.	-0.0023	0.0002
Central City	.	.	.	.	.	.	-0.0149	0.0019
State Unemployment Rate (%)	.	.	-0.0099	0.0007	.	.	-0.0066	0.0010
Any Children*State UR (%)	.	.	0.0015	0.0008	.	.	0.0021	0.0011
Number of Observations	373,662		373,662		119,019		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 2 for sample restrictions.

Controls: Specifications (1) and (3) only include indicators for year. Specifications (2) and (4) 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). She does not live in a central city (March) and has only a high school education. See text for details.

Table 4
Probit Estimates of the Effect of Policy Variables On the Employment of Single Women

Average Derivative (Standard Error)

	CPS Outgoing Rotation Group, 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	-0.0230	-0.0454	-0.0298	-0.0135	-0.0287	-0.0855	-0.0389	-0.0108
in $1000s/year	(0.0030)	(0.0086)	(0.0052)	(0.0041)	(0.0035)	(0.0147)	(0.0068)	(0.0033)
Welfare Maximum Benefit	-0.0293	-0.0468	-0.0322	-0.0173	-0.0190	-0.0547	-0.0265	-0.0035
in $1000s/year	(0.0021)	(0.0060)	(0.0037)	(0.0029)	(0.0024)	(0.0102)	(0.0048)	(0.0024)
Welfare Benefit if Work	0.0655	0.0720	0.0820	0.0414	0.0357	0.1084	0.0460	0.0117
in $1000s/year	(0.0063)	(0.0181)	(0.0109)	(0.0086)	(0.0068)	(0.0285)	(0.0132)	(0.0065)
Probability of AFDC Receipt	-0.1734	-0.3062	-0.2591	-0.0801	-0.1158	-0.2529	-0.1690	-0.0602
If Work	(0.0230)	(0.0636)	(0.0405)	(0.0316)	(0.0244)	(0.1002)	(0.0480)	(0.0238)
Medicaid if Work	-0.0087	-0.0080	0.0085	-0.0153	-0.0019	-0.0156	0.0057	-0.0049
in $1000s/year	(0.0044)	(0.0119)	(0.0077)	(0.0061)	(0.0043)	(0.0169)	(0.0084)	(0.0043)
Waiver - Any Time Limit	0.0118	0.0449	0.0175	-0.0055	0.0125	0.0251	0.0057	0.0090
(Indicator Variable)	(0.0062)	(0.0175)	(0.0110)	(0.0082)	(0.0081)	(0.0324)	(0.0159)	(0.0079)
Waiver - Any Terminations	0.0196	0.0392	0.0330	0.0100	0.0315	0.1147	0.0409	0.0081
(Indicator Variable)	(0.0097)	(0.0283)	(0.0167)	(0.0127)	(0.0145)	(0.0597)	(0.0285)	(0.0133)
Training Program - Education	-0.0692	-0.0901	-0.0642	-0.0446	-0.0488	-0.0665	-0.0920	-0.0137
in $1000s/year	(0.0166)	(0.0469)	(0.0287)	(0.0227)	(0.0202)	(0.0834)	(0.0386)	(0.0200)
Training Program - Other	0.0380	0.0516	0.0544	0.0197	0.0337	0.0640	0.0482	0.0148
in $1000s/year	(0.0103)	(0.0296)	(0.0175)	(0.0140)	(0.0125)	(0.0519)	(0.0241)	(0.0124)
Child Care	0.0180	0.0300	0.0157	0.0159	0.0137	0.0411	0.0109	0.0098
in $1000s/year	(0.0057)	(0.0160)	(0.0095)	(0.0082)	(0.0065)	(0.0279)	(0.0123)	(0.0062)
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).

Restrictions: See Table 2 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 3 (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 6, under 3, under 2, and under 1. Lastly, 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.

Table 5
Probit Estimates of the Effect of Policy Variables On the Employment of Single Women, Children Interactions

Average Derivative (Standard Error)

	CPS Outgoing Rotation Group, Worked Last Week = 1				March CPS, Worked Last Year = 1			
Explanatory Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Income Taxes if Work	-0.0244	-0.0138	-0.0432	-0.0162	-0.0269	-0.0250	-0.0319	-0.0178
in $1000s/year	(0.0039)	(0.0035)	(0.0045)	(0.0063)	(0.0047)	(0.0040)	(0.0054)	(0.0071)
Welfare Maximum Benefit	-0.0321	-0.0133	-0.0300	-0.0099	-0.0180	-0.0042	-0.0193	-0.0017
in $1000s/year	(0.0025)	(0.0053)	(0.0022)	(0.0055)	(0.0029)	(0.0056)	(0.0025)	(0.0058)
Welfare Benefit if Work	0.0766	0.0108	0.0697	0.0082	0.0390	-0.0020	0.0394	-0.0035
in $1000s/year	(0.0077)	(0.0087)	(0.0062)	(0.0089)	(0.0082)	(0.0087)	(0.0068)	(0.0089)
Probability of AFDC	-0.1819	-0.1050	-0.1825	-0.0932	-0.1297	-0.0627	-0.1286	-0.0603
Receipt If Work	(0.0295)	(0.0298)	(0.0233)	(0.0307)	(0.0299)	(0.0321)	(0.0249)	(0.0336)
Medicaid if Work	-0.0126	0.0090	-0.0081	0.0070	-0.0051	0.0065	-0.0028	0.0058
in $1000s/year	(0.0061)	(0.0046)	(0.0044)	(0.0047)	(0.0055)	(0.0045)	(0.0043)	(0.0046)
Waiver - Any Time Limit	.	0.0201	0.0107	0.0153	.	0.0191	0.0113	0.0151
(Indicator Variable)	.	(0.0067)	(0.0065)	(0.0069)	.	(0.0087)	(0.0085)	(0.0090)
Waiver - Any Terminations	.	0.0178	0.0164	0.0136	.	0.0255	0.0291	0.0242
(Indicator Variable)	.	(0.0099)	(0.0098)	(0.0101)	.	(0.0150)	(0.0147)	(0.0153)
Training Program - Education	-0.0645	-0.0679	-0.0498	-0.0680	-0.0502	-0.0424	-0.0389	-0.0455
in $1000s/year	(0.0207)	(0.0177)	(0.0179)	(0.0193)	(0.0253)	(0.0213)	(0.0217)	(0.0233)
Training Program - Other	0.0653	0.0435	0.0332	0.0376	0.0447	0.0381	0.0301	0.0338
in $1000s/year	(0.0122)	(0.0112)	(0.0106)	(0.0115)	(0.0150)	(0.0135)	(0.0127)	(0.0137)
Child Care	-0.0022	0.0162	0.0234	0.0157	-0.0038	0.0121	0.0178	0.0114
in $1000s/year	(0.0079)	(0.0058)	(0.0061)	(0.0063)	(0.0087)	(0.0067)	(0.0071)	(0.0073)
1994-1996 Excluded	Yes	No	No	No	Yes	No	No	No
Children*State Interactions	No	Yes	No	Yes	No	Yes	No	Yes
Children*Year Interactions	No	No	Yes	Yes	No	No	Yes	Yes
Number of Observations	292,731	373,662			93,816	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).

Restrictions: See Table 2 for sample restrictions. Specifications (1) and (5) exclude 1994-1996.

Controls: See Table 4 for controls. Indicators for interactions between state and any AFDC eligible children are included in specifications (2), (4), (6), and (8). Indicators for interactions between year and both any AFDC eligible children and any EITC eligible children are included in specifications (3), (4), (7), and (8).

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.

Table 6
Probit Estimates of the Effect of Policy Variables
On the Employment of Single Women, Alternative Specifications
Average Derivative (Standard Error)

	CPS Outgoing Rotation Group, Worked Last Week =1				March CPS, Worked Last Year =1			
Explanatory Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Income Taxes if Work	-0.0139	-0.0380	-0.0103	-0.0114	-0.0262	-0.0263	-0.0241	-0.0175
in $1000s/year	(0.0086)	(0.0041)	(0.0036)	(0.0023)	(0.0128)	(0.0043)	(0.0037)	(0.0028)
Welfare Maximum Benefit	-0.0114	-0.0367	-0.0234	-0.0207	-0.0028	-0.0216	-0.0138	-0.0160
in $1000s/year	(0.0064)	(0.0027)	(0.0027)	(0.0013)	(0.0091)	(0.0028)	(0.0028)	(0.0015)
Welfare Benefit if Work	0.0127	0.0783	0.0664	0.0320	-0.0053	0.0411	0.0359	0.0214
in $1000s/year	(0.0103)	(0.0079)	(0.0086)	(0.0031)	(0.0140)	(0.0076)	(0.0087)	(0.0030)
Probability of AFDC Receipt	-0.1044	-0.1986	-0.1523	-0.1266	-0.0854	-0.1400	-0.0793	-0.0843
If Work	(0.0363)	(0.0288)	(0.0312)	(0.0163)	(0.0531)	(0.0277)	(0.0307)	(0.0161)
Medicaid if Work	0.0033	-0.0154	-0.0098	0.0017	0.0084	-0.0022	-0.0057	0.0053
in $1000s/year	(0.0060)	(0.0054)	(0.0059)	(0.0037)	(0.0077)	(0.0049)	(0.0053)	(0.0035)
Waiver - Any Time Limit	0.0175	0.0160	0.0062	0.0155	0.0255	0.0175	-0.0008	0.0159
(Indicator Variable)	(0.0080)	(0.0084)	(0.0083)	(0.0062)	(0.0141)	(0.0098)	(0.0100)	(0.0080)
Waiver - Any Terminations	0.0160	0.0379	0.0067	0.0211	0.0354	0.0355	0.0229	0.0335
(Indicator Variable)	(0.0116)	(0.0132)	(0.0129)	(0.0097)	(0.0238)	(0.0173)	(0.0186)	(0.0144)
Training Program - Education	-0.0772	-0.0572	-0.0181	-0.0509	-0.0667	-0.0688	-0.0255	-0.0299
in $1000s/year	(0.0223)	(0.0319)	(0.0198)	(0.0161)	(0.0365)	(0.0301)	(0.0226)	(0.0197)
Training Program - Other	0.0444	0.0071	0.0351	0.0454	0.0578	0.0420	0.0125	0.0395
in $1000s/year	(0.0133)	(0.0193)	(0.0120)	(0.0102)	(0.0214)	(0.0190)	(0.0137)	(0.0125)
Child Care	0.0195	0.0018	.	0.0197	0.0171	0.0118	.	0.0152
in $1000s/year	(0.0073)	(0.0071)	.	(0.0056)	(0.0114)	(0.0079)	.	(0.0064)
Include Women w/o Children	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Incl. Mothers with Children < 6	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Include Mothers w/o Children < 6	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Wages/Hours Vary by Group	No	No	No	Yes	No	No	No	Yes
Number of Observations	122,966	303,396	317,178	373,662	40,818	95,786	99,157	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).

Restrictions: See Table 2 for sample restrictions. Specifications (1) and (5) include only single mothers with children eligible for both the EITC and AFDC. Specifications (2) and (6) exclude mothers with no children under six, and specifications (3) and (7) exclude mothers with at least one child under six.

Controls: See Table 4 for controls. In specifications (4) and (8) indicators are included for each individual group for which the joint hours/wage distribution is calculated (90 groups in all).

Notes: In specifications (1)-(3) and (5)-(7) the tax, welfare, and Medicaid variables are calculated using a joint hours/wage distribution estimated separately for single women with and without children. In specifications (4) and (8) the joint hours/wage distribution is specific to groups defined by full interactions of region, education, age, and minority status, and is calculated using only single women without children. Taxes and welfare are adjusted for state cost of living differences and are in 1996 dollars. See Appendix 1 for specific indices used and other details.

Table 7
Effect of CPS Redesign on the Employment of Single Women
ORG and March CPS Comparisons

	CPS Outgoing Rotation Group,				March CPS	
	Children	No Children	Difference	Standard Error	Children	No Children
Employment Rate (from Table 2)						
1992	0.5790	0.7957	-0.2167	0.0057	0.7387	0.9299
1993	0.5875	0.7918	-0.2044	0.0057	0.7511	0.9356
1994	0.6053	0.7921	-0.1868	0.0057	0.7907	0.9312
Yearly Differences						
1993-1992	0.0085	-0.0039	0.0124	0.0080	0.0125	0.0057
1994-1993	0.0178	0.0003	0.0175	0.0080	0.0396	-0.0044
Effect of Redesign on March CPS (March-ORG, 1993-1992)					0.0040	0.0096
Effect of Redesign on ORG (ORG-March, 1994-1993)					-0.0218	0.0047

Sources: The data are from the 1992-1994 Current Population Survey Outgoing Rotation Group File (ORG) and the 1993-1995 March Current Population Survey (March) and are weighted.
Restrictions: See Table 2 for restrictions.

Table 8
Effect of CPS Redesign on the Employment of Single Women
ORG and Parallel Survey Comparisons

	Children		No Children		Difference	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
1993 Parallel Survey	0.5926	0.0055	0.7915	0.0033	-0.1988	0.0064
1993 ORG	0.5875	0.0048	0.7918	0.0029	-0.2044	0.0057
Effect of Redesign on ORG	0.0052	0.0073	-0.0004	0.0044	0.0055	0.0086

Sources: The data are from the 1993 Current Population Survey Outgoing Rotation Group File (ORG) and the 1993 Current Population Survey Parallel Survey and are weighted.
Restrictions: See Table 1 for restrictions.

Table 9
Hours Worked for Single Mothers and Single Women Without Children, 1984-1996

	CPS Outgoing Rotation Group, Hours in Reference Week				March CPS, Annual Hours/52			
Year	**Children**	**No Children**	**Difference**	**Standard Error**	**Children**	**No Children**	**Difference**	**Standard Error**
1984	21.928	30.792	-8.864	0.247	24.193	33.209	-9.016	0.369
1985	22.180	31.289	-9.109	0.244	23.766	33.789	-10.024	0.374
1986	22.193	31.830	-9.637	0.242	23.937	33.869	-9.933	0.368
1987	22.410	31.986	-9.576	0.240	24.912	34.246	-9.334	0.371
1988	23.183	32.413	-9.230	0.252	24.812	34.551	-9.739	0.384
1989	23.342	32.170	-8.828	0.248	26.002	34.333	-8.330	0.368
1990	23.035	32.008	-8.973	0.240	25.308	34.150	-8.841	0.362
1991	21.992	31.289	-9.296	0.240	24.880	33.952	-9.072	0.360
1992	21.675	30.838	-9.163	0.240	24.324	33.305	-8.982	0.364
1993	22.377	30.894	-8.517	0.243	24.960	33.370	-8.410	0.374
1994	22.593	30.480	-7.888	0.246	26.711	33.505	-6.794	0.372
1995	23.448	30.784	-7.336	0.248	27.714	34.150	-6.436	0.393
1996	24.023	30.805	-6.782	0.262	27.412	33.601	-6.190	0.383

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) and are weighted.

Restrictions: Both samples include 19-44 year-old single women (divorced, widowed, and never married) who are not in school. The March sample excludes disabled or ill women and those with positive earned income but zero hours of work.

Table 10
Tobit and OLS Estimates of the Effect of Policy Variables
On the Hours Worked of Single Women
Average Derivative (Standard Error)

	Tobit, All Obserations				OLS, Positive Hours Only			
	Single Women		Single Mothers		Single Women		Single Mothers	
	ORG	March	ORG	March	ORG	March	ORG	March
Explanatory Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Income Taxes if Work	-1.4356	-1.8064	-0.9082	-1.1886	-0.5130	-0.4540	-0.1578	0.6392
in $1000s/year	(0.1536)	(0.2024)	(0.3880)	(0.5603)	(0.1031)	(0.1740)	(0.2755)	(0.4863)
Welfare Maximum Benefit	-1.6005	-1.2446	-0.6247	-0.2717	-0.1219	-0.3894	-0.3332	-0.4747
in $1000s/year	(0.1097)	(0.1451)	(0.2938)	(0.4189)	(0.0750)	(0.1255)	(0.2132)	(0.3721)
Welfare Benefit if Work	3.6203	3.2988	0.5626	-0.4662	0.2796	1.3537	0.3127	0.1737
in $1000s/year	(0.3373)	(0.4228)	(0.4805)	(0.6517)	(0.2412)	(0.3754)	(0.3646)	(0.5882)
Probability of AFDC Receipt	-11.1844	-11.9441	-6.1280	-6.5993	-2.3269	-4.5396	-2.9038	-3.7394
If Work	(1.2356)	(1.5777)	(1.6733)	(2.4605)	(0.8649)	(1.3936)	(1.2285)	(2.1850)
Medicaid if Work	-0.3977	-0.1982	0.2234	0.8540	0.2507	0.3981	0.3121	1.0007
in $1000s/year	(0.2381)	(0.2893)	(0.2825)	(0.3837)	(0.1698)	(0.2623)	(0.2169)	(0.3579)
Waiver - Any Time Limit	0.4239	0.9812	0.6337	1.4969	-0.4254	0.3637	-0.3385	0.7571
(Indicator Variable)	(0.3281)	(0.5002)	(0.3575)	(0.6114)	(0.2219)	(0.4283)	(0.2528)	(0.5263)
Waiver - Any Terminations	0.9035	1.1776	0.5868	0.2269	-0.2414	-0.2323	-0.0011	-0.4091
(Indicator Variable)	(0.4976)	(0.8272)	(0.5061)	(0.9416)	(0.3300)	(0.6936)	(0.3493)	(0.7925)
Training Program - Education	-4.1317	-2.4936	-2.9187	-0.9591	0.0551	1.6041	0.4836	1.4687
in $1000s/year	(0.8686)	(1.2314)	(0.9985)	(1.5927)	(0.5776)	(1.0495)	(0.7017)	(1.3780)
Training Program - Other	2.1050	1.6835	1.6128	1.7091	0.2867	0.1329	0.6514	1.0360
in $1000s/year	(0.5303)	(0.7522)	(0.5888)	(0.9213)	(0.3496)	(0.6379)	(0.4130)	(0.7966)
Child Care	1.0131	1.4563	0.9629	1.3811	-0.7989	-0.5648	-0.6694	-0.5481
in $1000s/year	(0.3137)	(0.4276)	(0.3369)	(0.5060)	(0.2237)	(0.3775)	(0.2448)	(0.4401)
Number of Observations	373,662	119,019	122,966	40,818	276,156	103,759	73,810	30,701

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).

Restrictions: See Table 2 for sample restrictions. Specifications (3), (4), (7), and (8) include only single mothers with children eligible for both the EITC and AFDC. Specifications (5)-(8) exclude women with zero hours worked.

Controls: See Table 4 for controls.

Notes: The dependent variables in the ORG and March samples are hours worked in the reference week and hours worked last year (divided by 52), respectively. The Tobit specifications assume that zero hours observations are censored and report the average derivative for observed hours. 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.

Table 11
Contribution of Policy Changes to the Changes in the Employment of Single Mothers 1984-1996 and 1992-1996

	1984-1996				1992-1996			
	ORG		March		ORG		March	
Explanatory Variable	Change in Emp	% of Total	Change in Emp	% of Total	Change in Emp	% of Total	Change in Emp	% of Total
Income Taxes if Work	0.0369	62.6%	0.0461	63.1%	0.0156	37.3%	0.0195	34.5%
Welfare Maximum Benefit	0.0155	26.3%	0.0100	13.7%	0.0098	23.5%	0.0064	11.3%
Welfare Benefit if Work	0.0004	0.7%	0.0002	0.3%	-0.0038	-9.1%	-0.0021	-3.7%
Probability of AFDC Receipt if Work	-0.0002	-0.3%	-0.0001	-0.2%	0.0017	4.1%	0.0012	2.1%
Medicaid if Work	-0.0036	-6.2%	-0.0008	-1.1%	-0.0011	-2.7%	-0.0002	-0.4%
Total Welfare Benefits & Medicaid	0.0121	20.5%	0.0093	12.8%	0.0066	15.8%	0.0052	9.2%
Waiver - Any Time Limit	0.0046	7.9%	0.0049	6.8%	0.0045	10.8%	0.0048	8.5%
Waiver - Any Terminations	0.0040	6.8%	0.0065	8.8%	0.0040	9.6%	0.0065	11.5%
Total Welfare Waivers	0.0087	14.7%	0.0114	15.6%	0.0086	20.4%	0.0113	20.0%
Training Program - Education	-0.0087	-14.8%	-0.0062	-8.4%	-0.0018	-4.3%	-0.0013	-2.2%
Training Program - Other	0.0055	9.4%	0.0049	6.7%	0.0040	9.6%	0.0036	6.3%
Child Care	0.0054	9.2%	0.0041	5.7%	0.0010	2.4%	0.0008	1.4%
Total Training & Child Care	0.0023	3.9%	0.0029	4.0%	0.0032	7.7%	0.0031	5.4%
Other	-0.0010	-1.7%	0.0034	4.6%	0.0078	18.7%	0.0174	30.9%
Total	0.0589	100.0%	0.0731	100.0%	0.0418	100.0%	0.0564	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).

Notes: *Change in Employment* gives the change in the employment of single mothers over the specified time period that is due to the given explanatory variable(s). *% of Total* gives the percentage of the total employment increase explained by the given explanatory variable(s). The parameter estimates used to calculate these statistics come from Tables 3 and 4, while the change in policy variables comes from Appendix Table 1.

Appendix Table 1
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	.
Income Taxes if Work	1.522	2.751	1.030	2.958	0.811	2.967	0.079	2.914
Welfare Maximum Benefit	7.583	.	7.406	.	7.391	.	7.056	.
Welfare Benefit if Work	1.482	.	1.478	.	1.546	.	1.488	.
Probability of AFDC Receipt if Work	0.255	.	0.287	.	0.266	.	0.256	.
Medicaid if Work	1.020	0.000	1.114	0.000	1.309	0.004	1.444	0.008
Any Time Limit	0.000	.	0.000	.	0.010	.	0.394	.
Any Terminations	0.000	.	0.000	.	0.000	.	0.205	.
Extended Transitional Assistance	0.000	.	0.000	.	0.007	.	0.119	.
Major Waiver Application	0.000	.	0.015	.	0.223	.	0.847	.
Training Progam - Education	0.000	.	0.000	.	0.100	.	0.126	.
Training Progam - Other	0.126	.	0.039	.	0.166	.	0.272	.
Child Care	0.000	.	0.000	.	0.246	.	0.302	.
Number of Observations	9,391	18,914	9,211	18,612	10,333	19,311	8,788	15,846

Source: The data are from the 1984-1996 Current Population Survey Outgoing Rotation Group File (ORG).
Restrictions: See Table 1 for sample restrictions.
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 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.

Appendix Table 2
Characteristics of Single Mothers and Single Women Without Children
Mean (Standard Deviation)

Variable	ORG		March	
	Children	No Children	Children	No Children
Age	31.91	28.30	31.49	28.18
	(6.88)	(7.20)	(6.95)	(7.29)
Nonwhite	0.375	0.174	0.367	0.172
Hispanic	0.110	0.075	0.110	0.076
High School Dropout	0.237	0.093	0.219	0.076
Some College	0.253	0.308	0.267	0.332
Bachelors	0.064	0.211	0.070	0.219
Masters	0.023	0.064	0.027	0.068
Divorced	0.506	0.164	0.515	0.181
Widowed	0.050	0.012	0.052	0.014
Living with Parents	0.151	0.365	0.143	0.328
Living with Unrelated Adult Male	0.133	0.179	0.137	0.190
# of Children under 18	1.69	.	1.65	.
	(1.00)	.	(1.01)	.
# of Children under 6	0.60	.	0.62	.
	(0.77)	.	(0.78)	.
Pregnant	.	.	0.073	.
Central City	.	.	0.356	0.330
Unearned Income	.	.	803	592
	.	.	(4,416)	(3,519)
Earned Income	.	.	13,772	19,490
	.	.	(14,871)	(16,612)
Earnings Conditional on Working	.	.	18,165	20,790
	.	.	(14,557)	(16,350)
Worked Last Week (ORG) or Last Year (March)	0.600	0.805	0.759	0.939
Hours Last Week (ORG) or Last Year (March)	22.7	31.3	1,319	1,760
	(20.4)	(18.3)	(959)	(756)
Hours Conditional on Working	37.8	39.0	1,738	1,875
	(11.0)	(11.0)	(695)	(628)
Weeks Worked Last Year	.	.	34.0	45.3
	.	.	(22.5)	(14.7)
Any Public Assistance Income	.	.	0.281	0.018
Number of Observations	126,750	246,912	43,095	75,294

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) and are weighted.

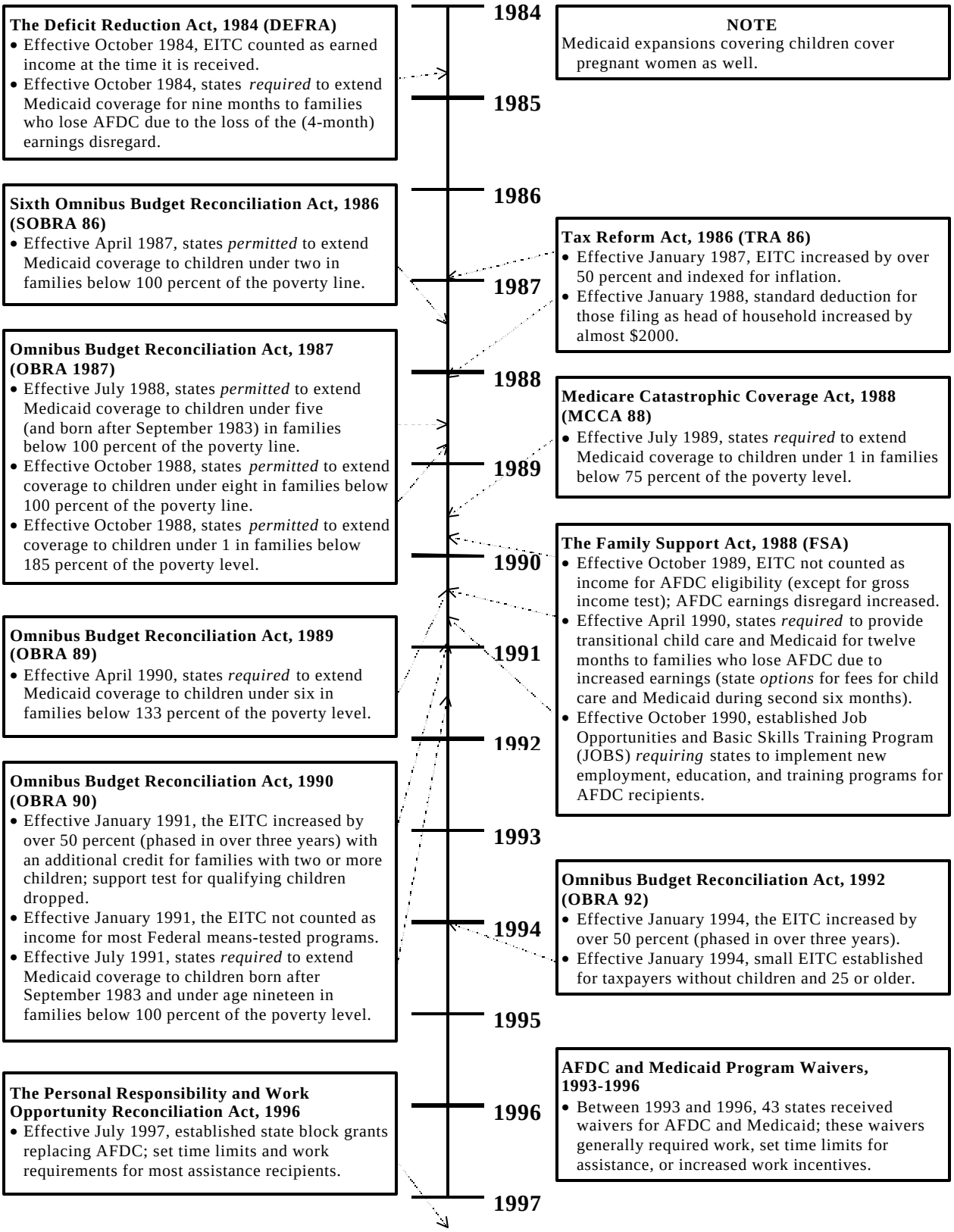
Restrictions: See Table 2 for sample restrictions.

Notes: *Unearned income* includes interest, dividend, rental, Social Security, veterans' benefits, and retirement

income. All dollar amounts are expressed in 1996 PCE deflated dollars. See text for details.

Figure 1

Major Tax and Welfare Policy Changes Affecting Low Income Women, 1984-1997


1984
1985
1986
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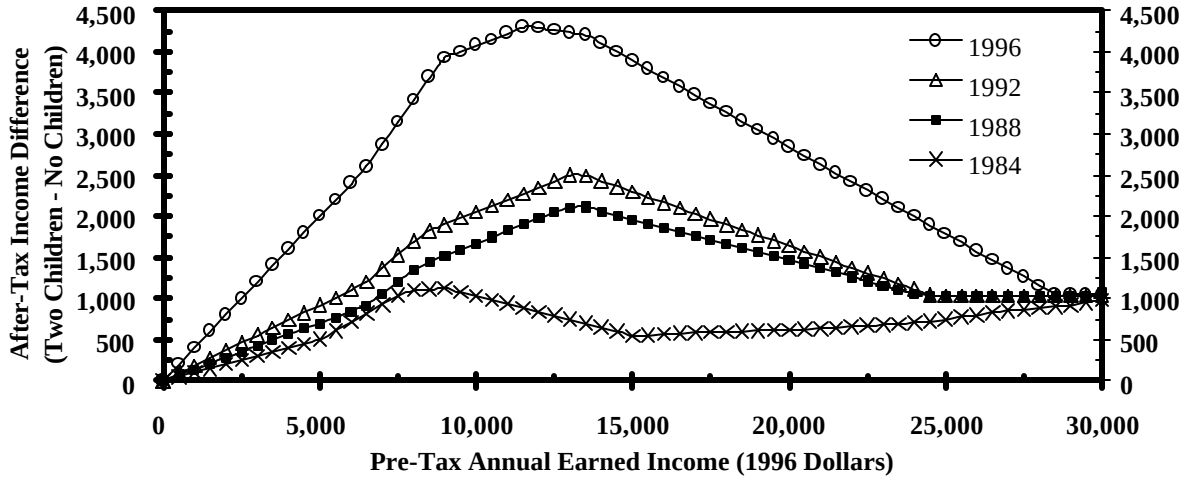
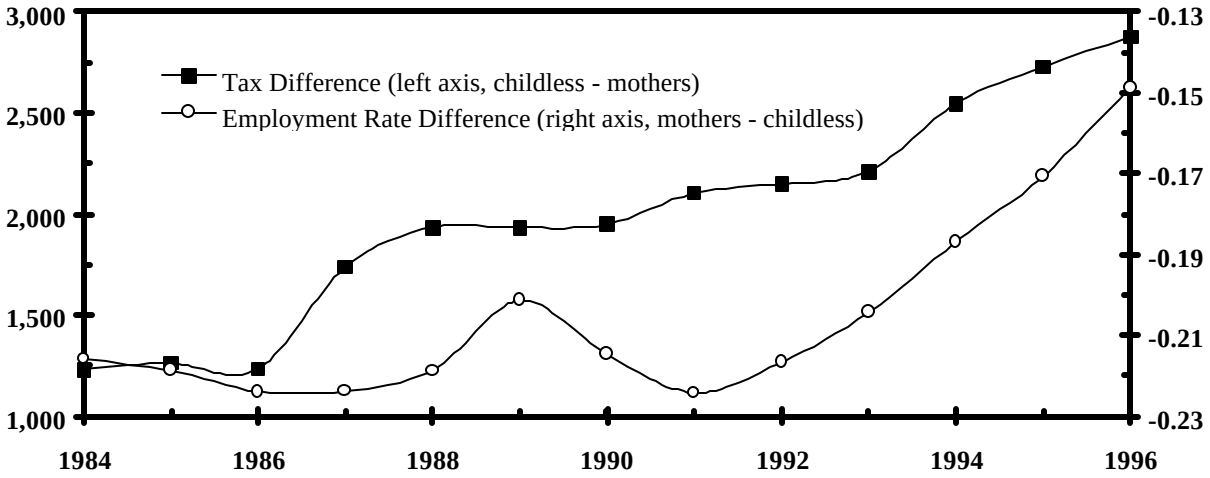
The Deficit Reduction Act, 1984 (DEFRA)
• Effective October 1984, EITC counted as earned income at the time it is received.
• Effective October 1984, states required to extend Medicaid coverage for nine months to families who lose AFDC due to the loss of the (4-month) earnings disregard.
Sixth Omnibus Budget Reconciliation Act, 1986 (SOBRA 86)
• Effective April 1987, states permitted to extend Medicaid coverage to children under two in families below 100 percent of the poverty line.
Omnibus Budget Reconciliation Act, 1987 (OBRA 1987)
• Effective July 1988, states permitted to extend Medicaid coverage to children under five (and born after September 1983) in families below 100 percent of the poverty line.
• Effective October 1988, states permitted to extend coverage to children under eight in families below 100 percent of the poverty line.
• Effective October 1988, states permitted to extend coverage to children under 1 in families below 185 percent of the poverty level.
Omnibus Budget Reconciliation Act, 1989 (OBRA 89)
• Effective April 1990, states required to extend Medicaid coverage to children under six in families below 133 percent of the poverty level.
Omnibus Budget Reconciliation Act, 1990 (OBRA 90)
• Effective January 1991, the EITC increased by over 50 percent (phased in over three years) with an additional credit for families with two or more children; support test for qualifying children dropped.
• Effective January 1991, the EITC not counted as income for most Federal means-tested programs.
• Effective July 1991, states required to extend Medicaid coverage to children born after September 1983 and under age nineteen in families below 100 percent of the poverty level.
The Personal Responsibility and Work Opportunity Reconciliation Act, 1996
• Effective July 1997, established state block grants replacing AFDC; set time limits and work requirements for most assistance recipients.
NOTE
Medicaid expansions covering children cover pregnant women as well.
Tax Reform Act, 1986 (TRA 86)
• Effective January 1987, EITC increased by over 50 percent and indexed for inflation.
• Effective January 1988, standard deduction for those filing as head of household increased by almost $2000.
Medicare Catastrophic Coverage Act, 1988 (MCCA 88)
• Effective July 1989, states required to extend Medicaid coverage to children under 1 in families below 75 percent of the poverty level.
The Family Support Act, 1988 (FSA)
• Effective October 1989, EITC not counted as income for AFDC eligibility (except for gross income test); AFDC earnings disregard increased.
• Effective April 1990, states required to provide transitional child care and Medicaid for twelve months to families who lose AFDC due to increased earnings (state options for fees for child care and Medicaid during second six months).
• Effective October 1990, established Job Opportunities and Basic Skills Training Program (JOBS) requiring states to implement new employment, education, and training programs for AFDC recipients.
Omnibus Budget Reconciliation Act, 1992 (OBRA 92)
• Effective January 1994, the EITC increased by over 50 percent (phased in over three years).
• Effective January 1994, small EITC established for taxpayers without children and 25 or older.
AFDC and Medicaid Program Waivers, 1993-1996
• Between 1993 and 1996, 43 states received waivers for AFDC and Medicaid; these waivers generally required work, set time limits for assistance, or increased work incentives.

Figure 2
After-Tax Income of a Single Mother with Two Children
Minus a Single Woman Without Children: 1984, 1988, 1992, 1996



Notes: 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.

Figure 3
Tax and Employment Rate Differences
Between Single Women With and Without Children



Source: The data are from the 1984-1996 CPS Outgoing Rotation Group File (ORG).
Notes: *Tax Difference* gives the difference in taxes paid by single women without children minus those paid by single mothers. *Employment Rate Difference* gives the difference in weekly employment for single mothers minus single women without children.