

The Incentives of Government Programs and the Well-Being of Families

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In recent years, there have been unprecedented changes in welfare. The 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) abolished Aid to Families with Dependent Children (AFDC) and created Temporary Assistance for Needy Families (TANF), a set of block grants to states with few restrictions. States are required to spend at least 75 percent of their “historic” level of AFDC spending, a five-year lifetime limit is imposed on receipt of federal cash assistance (though hardship exemptions are included in the law), and states must meet certain targets in moving portions of their caseloads into work activities. Between January 1993 and December 1999, welfare caseloads fell by 52 percent, to 2.4 million families from 5 million. These changes in welfare caseloads mirror changes in employment rates of single women, which rose to 76.5 percent in 1998–1999, from 67.5 percent in 1989–1990.¹

Although welfare reform is frequently linked with caseload reductions in popular media discussions,² a combination of three developments presumably account for these trends. First, aggregate GDP has increased since March 1991 (115 consecutive months through November 2000), the longest economic expansion in U.S. history. Although there appears to be considerable variation in the relation between macroeconomic performance and poverty alleviation, a strong economy, all else equal, helps low-income workers. Second, many states experimented with their welfare systems even prior to PRWORA, and innovations in welfare

¹ We thank Maria Cancian for providing these employment rates from pooled CPS samples.

² See, for example, “Welfare Reform Is On a Roll; Working Poor Still Struggle, Study Says,” *Washington Post*, p.1, 8/3/99 and “Welfare Law Buys the ‘Working Poor’,” *USA Today*, p.1, 6/9/99.

programming only increased following the abolition of AFDC. Most policy innovations in welfare reform have focused on increasing work among program participants. Third, there were sharp increases in the Earned Income Tax Credit (EITC) in 1990 and again in 1993. The EITC, by increasing the effective wage received by low-skilled workers, should induce people to enter the labor market.

At least two papers using household-level data systematically examine the effects of the economy, welfare reform, and the EITC in explaining changes in labor market participation among single women with children.³ Meyer and Rosenbaum (1999) find that EITC changes account for 63 percent of the increase in the employment rate of single mothers from 1984 to 1996 and 37 percent of the increase from 1992 to 1996. Ellwood (1999) finds a somewhat smaller effect of the EITC, concluding “20 percent of the growth in work can be traced to the economy, perhaps another 50 percent is linked to welfare reform, and the remaining 30 percent can be traced to the EITC and other work supports. Each of these might be too high or low by perhaps 10 percent” (p. 25). These papers, as well as several studies that focus solely on the labor market effects of the EITC, are high quality and methodologically diverse. Yet existing studies share features that leave room for useful new work on the effects of the EITC on labor market behavior.

First, data for the existing studies come either from the Current Population Survey (CPS) or the Survey of Income and Program Participation (SIPP). As discussed in Hotz and Scholz (2000b), the ratio of AFDC recipients reported in the CPS to administrative counts of recipients fell from 86.7 percent in 1990 to 79.6 percent in 1996. The ratio of AFDC dollars to administrative totals was 78.4 percent in the 1984 CPS and 67.7 percent by 1996. These trends raise a concern about the ability of studies using the CPS or SIPP to accurately characterize the tax and transfer environment facing low-income families.

Second, the national sampling frames from the CPS and SIPP make it difficult to account for local labor market characteristics that might significantly influence labor market outcomes. Bartik and Eberts (1999) criticize studies that include only unemployment rates to account for labor market conditions, noting that the “unemployment rate by itself may be a woefully incomplete measure of economic conditions affecting potential welfare recipients.” They instead develop a set of measures that are intended to reflect the availability of attractive jobs to welfare recipients (these include measures of state employment growth and the industrial mix of the state). Their central conclusion is that these more textured measures of the economic environment facing welfare families matter in understanding caseload changes. It is also difficult to characterize changes in AFDC/TANF over time (Ellwood, 1999, emphasizes this point) given that welfare reform alters the ways programs are administered as well as the parameters of benefit schedules.

Third, CPS and SIPP sample sizes are fairly small for the population that arguably is of greatest interest to policymakers, women with children who are trying to make the transition from welfare to work. Hence, it is difficult to translate directly the results of existing studies to the effects of the EITC on the employment of families on welfare.

³ A larger set of studies seeks to explain changes in aggregate state welfare caseloads. These are surveyed in Blank (2000).

This paper addresses these concerns. We begin with an overview of EITC, highlighting the two critical policy questions: is it administrable and does it work? Several new and potentially far-reaching policy initiatives have been introduced by the Treasury Department in response to long-standing concerns about EITC noncompliance. After describing these, we discuss existing evidence on the EITC's effectiveness.

Our new work focuses on a small geographic area—four counties in California that were the site of the California Work Pays Demonstration Project (the CWPDP)—to examine the labor market effects of the EITC. Studying a specific geographic area allows us to incorporate a detailed set of local labor market conditions that are likely to have independent effects on labor market performance. The CWPDP incorporated experimental variation in the benefits package received by treatment and control households. Consequently, we have a much more straightforward task than others in parsing effects of welfare changes from the effects of other factors when examining labor market developments.

Unlike previous studies, our sample is composed of welfare recipients. Focusing on welfare recipients raises a variety of methodological complications that are discussed later, but it has the virtue of focusing the analysis on a subpopulation of first-order policy importance. Given that we start with a sample of families with children, we also adopt a subtle approach to identifying the effects of the EITC. Previous studies typically identify labor market effects of the EITC by comparing women with children to women without children, accounting to the extent possible for underlying factors that might differentially affect the two groups.⁴ The intuition underlining our study is different.

In 1994, the EITC became more generous than in previous years, increasing even more sharply for families with two or more children than it did for one-child families. If the EITC alters employment and earnings, all else being equal, we should expect to see a divergence in employment rates and earnings between families with one child and those with two or more children starting in 1994, as credit amounts available to these groups of families diverge. We also examine the hypothesis that if families with one child and families with two or more children are comparable, they should have similar labor market behavior prior to 1994.

Although the intuition for our strategy is straightforward, our empirical work is complicated by the fact that families in our sample are or have been on welfare. The problem that arises is simplest to see in the context of repeated cross-sectional data of AFDC recipients. Suppose the California economy is emerging from a recession and is growing rapidly in the period covered by our data. As the economy expands, recipients with higher levels of human capital are more likely to find jobs and leave welfare. Families that remain on AFDC will have lower levels of human capital and other attributes attractive to employers, relative to the average recipient in earlier periods. Thus, over time, we may find the likelihood of working falls purely through a change in the composition of the sample. If these compositional issues vary by family size, our identification strategy would lead to misleading inferences.

⁴ As part of their sensitivity analysis, Meyer and Rosenbaum (1999) examine differences in labor market effects generated by the EITC for families with two or more children relative to families with one child as is done in our paper.

We try to mitigate these problems with two approaches. First, we examine the robustness of our findings when we split our sample into “new” welfare recipients and continuing recipients. Second, we control for an extensive set of demographic characteristics of households and variables that index the timing and extent of their participation in welfare in an attempt to enhance the comparability of families with differing numbers of children. We discuss these sampling issues and our preliminary results in section 5. We show the EITC appears to have an economically (and statistically) significant, positive effect on employment rates of adults from families that were receiving welfare in California during the 1990s.

The Policy Environment for the EITC

In 1999, taxpayers with two or more children could receive an EITC of 40 percent of income up to \$9,540, for a maximum credit of \$3,816. Taxpayers (with two or more children) with earnings between \$9,540 and \$12,460 receive the maximum credit. Their credit is reduced by 21.06 percent of earnings between \$12,460 and \$30,585. The EITC schedule in 1999 for families with two or more children is shown in Figure 1. Table 1 shows the complete evolution of income eligibility thresholds, credit rates, and phase-out (or implicit tax) rates.

A key development for the purposes of this paper was put in place as part of the 1990 EITC expansions. After 1990, for the first time, families with two or more children were able to receive a larger EITC than they could if they had only one child. The difference through 1993,

Figure 1.
The Earned Income Tax Credit
for a Family with Two or More Children in 1979 and 1999

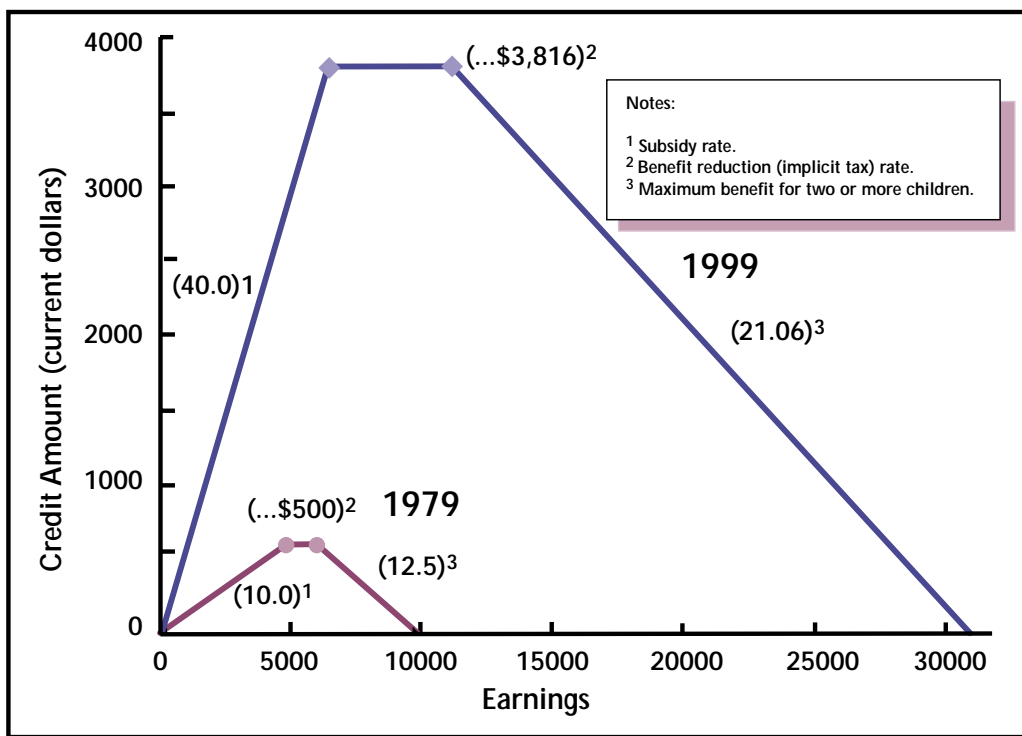


Table 1:
Earned Income Tax Credit Parameters, 1979-1998 (in nominal dollars)

Year	Phase-in Rate (%)	Phase-in Range	Maximum Credit	Phase-out Rate (%)	Phase-out Range
1975-78	10.0	\$0-\$4,000	\$400	10.0	\$4,000 - \$8,000
1979-84	10.0	0-5,000	500	12.5	6,000 - 10,000
1985-86	11.0	0-5,000	550	12.22	6,500 - 11,000
1987	14.0	0-6,080	851	10.0	6,920 - 15,432
1988	14.0	0-6,240	874	10.0	9,840 - 18,576
1989	14.0	0-6,500	910	10.0	10,240 - 19,340
1990	14.0	0-6,810	953	10.0	10,730 - 20,264
1991 ^a	16.7 ¹ 17.3 ²	0-7,140	1,192 1,235	11.93 12.36	11,250 - 21,250 11,250 - 21,250
1992 ^a	17.6 ¹ 18.4 ²	0-7,520	1,324 1,384	12.57 13.14	11,840 - 22,370 11,840 - 22,370
1993 ^a	18.5 ¹ 19.5 ²	0-7,750	1,434 1,511	13.21 13.93	12,200 - 23,050 12,200 - 23,050
1994	23.6 ¹ 30.0 ² 7.65 ³	0-7,750 0-8,245 0-4,000	2,038 2,528 306	15.98 17.68 7.65	11,000 - 23,755 11,000 - 25,296 5,000 - 9,000
1995	34.0 ¹ 36.0 ² 7.65 ³	0-6,160 0-8,640 0-4,100	2,094 3,110 314	15.98 20.22 7.65	11,290 - 24,396 11,290 - 26,673 5,130 - 9,230
1996	34.0 ¹ 40.0 ² 7.65 ³	0-6,330 0-8,890 0-4,220	2,152 3,556 323	15.98 21.06 7.65	11,610 - 25,078 11,610 - 28,495 5,280 - 9,500
1997	34.0 ¹ 40.0 ² 7.65 ³	0-6,500 0-9,140 0-4,340	2,210 3,656 332	15.98 21.06 7.65	11,930 - 25,750 11,930 - 29,290 5,430 - 9,770
1998	34.0 ¹ 40.0 ² 7.65 ³	0-6,680 0-9,390 0-4,460	2,271 3,756 341	15.98 21.06 7.65	12,260 - 26,473 12,260 - 30,095 5,570 - 10,030
1999	34.0 ¹ 40.0 ² 7.65 ³	0-6,800 0-9,540 0-4,530	2,312 3,816 347	15.98 21.06 7.65	12,460 - 26,928 12,460 - 30,580 5,670 - 10,200

Source: Committee on Ways and Means, U.S. House of Representative, *Green Book, 1998*, U.S. Government Printing Office, page 867. 1998 and 1999 parameters come from Publication 596, Internal Revenue Service

^a Basic credit only. Does not include supplemental young child or health insurance credits.

¹ Taxpayers with one qualifying child.

² Taxpayers with more than one qualifying child.

³ Childless taxpayers.

however, never exceeded \$77. As part of the 1993 EITC expansion, the differences became much larger (see Table 1); in 1994, the maximum difference was \$490, in 1995, it was \$1,016, and in 1996 it was \$1,404 (and indexed for inflation thereafter). This differential expansion by family size is the source of EITC variation that we examine later in this paper.

To receive the credit, taxpayers file their regular tax return and fill out the six-line Schedule EIC that gathers information about qualifying children. The EITC is refundable, meaning that the Treasury pays it out regardless of whether the taxpayer has any federal income tax liability. There are several basic tests for EITC eligibility. The taxpayer must have earned an adjusted gross income below a threshold that varies by year and by family size. To receive the credit available to families with children,⁵ the qualifying child must be younger than 19, younger than 24 if a full-time student, or any age if totally disabled. The claimant must be the parent, the grandparent, or foster parent of the child.⁶ The qualifying child must live with the taxpayer at least six months during the year (or 12 months if a foster child). Another rule limits the sum of taxable and tax-exempt interest, dividends, net capital gains, rents, royalties and “passive” income to less than \$2,350 (indexed for inflation).

There are two critical issues when assessing the policy merits of the EITC. First, it must be administrable—it should not impose an enormous cost to administer the credit. Moreover, those who are eligible for the credit should get it and those who are ineligible should not. Second, it should be effective—the credit should achieve its objective of supporting the incomes of low-wage workers in a less costly way than alternative delivery mechanisms. We consider these issues in turn.

Is the EITC Administrable?

Compared with alternative delivery mechanisms, the EITC is inexpensive to administer. Most EITC recipients would be required to file a tax return even in the absence of the credit; therefore, the marginal cost of obtaining the EITC is simply the small cost of filling out Schedule EIC. The cost to the IRS is also quite small. The entire IRS budget is roughly \$8 billion, and the IRS serves roughly 120 million individual taxpayers and 15 million corporations. The incremental cost of administering the EITC is surely a very small fraction of this total.⁷ The costs of administering major transfer programs for low-income families generally are several billion dollars, and these programs provide benefits to far fewer people than does the EITC.⁸

Although a system based largely on self-assessment (such as the U.S. income tax) will have lower administrative costs than a more bureaucratic approach, it will also have higher noncompliance. The most recent study of EITC noncompliance, which examined returns filed in 1997 (for tax year 1996), found that of the \$30.5 billion claimed in EITC, \$7.8 billion,

⁵A small credit available for childless taxpayers between the ages 24 and 65 with very low incomes was added in 1994. The credit rate for these taxpayers is 7.65 percent and the maximum credit in 1999 is \$347.

⁶ Until late 1999, a foster child was any child for whom the claimant cared for “as if the child is his or her own.” Now the caring stipulation still holds, but the child must also be placed in the home by an authorized placement agency.

⁷ As reported in Liebman (1997), the General Accounting Office estimates that the administrative costs of the EITC were less than 1 percent of dollars transferred (or less than \$300 million). The methodological basis for this estimate is weak, although our subjective assessment is that the bottom line is plausible.

⁸ See Holtzblatt (2000) for a good discussion of EITC administration.

or 25.6 percent of the total, exceeded the amount to which taxpayers were eligible (Internal Revenue Service, 2000). This overclaim rate was nearly identical to the 25.8 percent overclaim rate for tax returns filed in 1995 (Internal Revenue Service, 1997; McCubbin, 1999).⁹

The fact that error rates were unchanged between the 1995 and 1997 studies is modestly encouraging. EITC payments increased to \$30.6 billion in 1996 from \$23.7 billion in 1994. All models of tax noncompliance predict that noncompliance should increase with potential return. In addition, the most far-reaching EITC compliance initiatives were not enacted until the 1997 budget legislation and, hence, were not reflected in the 1997 study. These initiatives authorize the IRS to use new data to help detect the most pervasive types of EITC errors and provide resources for expanded education and outreach programs for taxpayers and professional tax preparers.

The new IRS study finds that EITC errors are most commonly associated with issues related to family status. About 22 percent of overclaimed EITC amounts were attributed solely to taxpayers claiming an ineligible child. Generally this was a result of taxpayers claiming children who did not live with them for six months (or one year if the qualifying child was a foster child). About 17 percent of overclaimed EITC amounts were attributed to taxpayers claiming the EITC when their incomes were lower than the income of another taxpayer in the household. The “AGI tiebreaker” test requires that when two taxpayers would otherwise be eligible to claim a child for the purposes of the EITC, the taxpayer with the higher income must make the claim. Almost 17 percent of the overclaimed amounts had to do with taxpayers filing as single or head of household when they should have filed as married filing separately.¹⁰

In summary, the major compliance problem is linked to eligibility criteria related to family status. That this is an ongoing, important source of error is not surprising. These provisions can be complicated (examples are the “abandoned spouse” and AGI tiebreaker rules) and, until recently, the IRS has not had access to independent information regarding taxpayers’ family status. Independent information is available on wage and salary earnings, which contributes to very low noncompliance rates associated with wage and salary income.

Noncompliance can be caused by confusion of well-meaning taxpayers as well as explicit efforts to defraud the system. Consider three examples. First, a divorced parent may claim a child for the purposes of the EITC because the divorce agreement grants the father the dependent exemption and the child spends a substantial amount of time at his house. Nevertheless, the claim would be noncompliant if the child does not spend at least half the year with the divorced father. It is easy to see how a taxpayer could be confused when he can claim the dependent exemption but cannot claim the EITC. Second, the recent compliance study showed the AGI tiebreaker rules were frequently violated when the claimant was the

⁹ In comparison, the last attempt to assess overall tax compliance (Internal Revenue Service, 1996) was for calendar year 1992 (using data from the 1988 Taxpayer Compliance Measurement Program). The “tax gap” in 1992—the difference between tax obligations and collections—was estimated to be between \$93.2 and \$95.2 billion. Total individual income tax collections in 1992 were \$503.1 billion. Over 40 percent of the tax gap was attributed to underreporting of business income, including self-employment income, partnership income, rents and royalties.

¹⁰ Other items (accounting for at least 10 percent of the overclaiming) include income reporting errors (14 percent of overclaims), a miscellaneous category of other errors and combinations of the listed factors (12.2 percent of overclaims) and taxpayers that were unwilling or unable to appear for audit (10 percent). Families in this last category are not necessarily noncompliant but may simply fear the IRS or have never received or been able to understand IRS notices.

child's parent who shared a home with the child's grandparent who had a higher income. Again, it is easy to see how a child's parent, who takes primarily responsibility for caring for the child, might not realize that in some circumstances they are unable to claim their child for the purposes of the EITC. Third, filing status errors can innocently arise when a separated couple has not yet obtained a legal separation. This is not to say there are no instances of purposeful noncompliance with the EITC. Nevertheless, it is clear that well-meaning taxpayers could misinterpret rules, resulting in EITC payments going to low-income working families with children that Congress did not intend to benefit.

The Treasury Department has responded creatively to the most recent study of EITC noncompliance. As part of the 1997 Budget Act, Congress directed the secretaries of Treasury and Health and Human Services to jointly use the Federal Case Registry (FCR) of Child Support orders to improve the accuracy of EITC claims. Almost all states are now reporting information to the FCR, typically identifying a child, the custodial parent, and a noncustodial parent. The IRS plans to send notices to explain the EITC residency rules to noncustodial parents who claimed the EITC on their 1999 tax returns. The Treasury Department is also asking for legislation that would allow the IRS to use mathematical error authority (which allows the IRS to deny the claim during processing, just as it would do for a calculation error on a return) to deny EITC claims when the FCR indicates the taxpayer is the noncustodial parent of the claiming child. These two measures (if legislation is passed to grant Treasury the math error authority they seek) would directly target the single largest source of EITC noncompliance.

The Treasury is also proposing rules that would significantly reduce problems associated with the AGI tiebreaker test. Under the proposal, a parent would be able to claim his or her child for the EITC even if the child lived with someone with a higher income so long as no other taxpayer claimed the qualifying child for the EITC and the higher-income taxpayer in the house did not have an income exceeding the maximum income cutoff for the EITC (\$31,152 in 2000).¹¹

To the question, is the EITC administrable? The EITC delivers more than \$30 billion to low-income, working families. Almost all information required for EITC eligibility is required on tax returns even in the absence of the EITC, and roughly 96 percent of EITC recipients would also file to pay positive tax obligations or to recover overwithheld taxes even without the EITC (Holtzblatt, 2000). Consequently, the credit imposes little incremental burden on taxpayers.

EITC noncompliance is clearly a headache for the IRS. In response to congressional interest, the IRS has given it a great deal of attention. Although a comprehensive study of overall tax compliance has not been conducted since 1988 (Congress outlawed the audits needed to do this), three special studies of EITC compliance were conducted in the 1990s. It is extremely unlikely that a systematic cost-benefit assessment of compliance efforts would result in the EITC being scrutinized with the amount of attention it has received. First, the EITC is only a

¹¹ Several additional proposals would also simplify the EITC and improve compliance, including simplifying abandoned spouse rules, extending a program to improve compliance among paid tax preparers, require both spouses to provide valid social security numbers on joint returns, tighten payments of the EITC to undocumented workers, alter the definition of dependent on the personal exemption and child tax credit to be closer to the definition used for the EITC, and make the definition of "earned income" the same for EITC purposes as it is for the rest of the individual income tax.

small fraction of the overall tax gap (Internal Revenue Service, 1996). Second, the size of individual EITC payments makes it necessary to examine a very large number of returns to reduce the tax gap. Third, once erroneous EITC payments are made, it is difficult to recover the money since recipients typically have low incomes.

These comments notwithstanding, EITC compliance studies consistently find error rates exceeding 20 percent. In addition to the immediate problem that a significant number of ineligible people are getting the credit, EITC noncompliance may also undermine taxpayers' faith in the IRS's ability to effectively and fairly administer the tax system. These adverse consequences of noncompliance should be balanced by the fact that administering the EITC through the tax system eliminates the need for creating a new, costly and possibly intrusive delivery mechanism. We expect the favorable tradeoff between administrative simplicity and noncompliance to increase as enacted and proposed noncompliance measures are implemented.

Is the EITC Effective?

In 1999, 19.5 million taxpayers received \$31.9 billion in EITC payments. Though the evidence is now somewhat dated, it appears that the EITC reaches a large percentage of its intended beneficiaries. Scholz (1994) used matched data from tax returns and the SIPP to calculate that 80–86 percent of taxpayers eligible for the EITC appeared to receive it in 1990.¹² EITC participation trends since 1990 are difficult to predict.

More than half of EITC payments go to families with incomes below the poverty line.¹³ In 1997 and 1998, the EITC lifted 4.3 million persons from poverty (Council of Economic Advisors, 1998, 2000). Because the EITC is based on annual family income and not wages, it is possible that people with high hourly wages who choose to work relatively few annual hours could receive the credit. In fact, the evidence suggests that in low-wage labor markets, incomes and wages are tightly linked. Authors' tabulations from April 1997 SIPP data show that 40 percent of EITC payments go to taxpayers with wages in the bottom quarter of all workers with children (below \$6.25 per hour), and 80 percent of all EITC benefits are paid to workers with wages below the median of \$9.78 per hour. If monthly hours are extrapolated to annual totals, 86.9 percent of EITC recipients worked at least 1,000 hours, and 68.1 percent worked more than 1,500 hours per year.

It is clear from the preceding statistics that the EITC successfully redistributes resources to working, low-income families. A second, more subtle goal of the EITC is to encourage employment among low-skill workers. To see how this might happen, consider Figure 2. Figure 2a shows total tax payments and marginal tax rates for two-parent, two-child California families in 1984.¹⁴ We assume workers bear the full burden of payroll taxes;

¹² Blumenthal, Erard, and Ho (1999) present similar participation rates for 1988 making use of detailed audit data from the 1988 Taxpayer Compliance Measurement Program. Hill et al. (1999) examine EITC participation rates for the sample used in this paper and find somewhat lower rates for the California welfare population than the overall rates found by Scholz.

¹³ The HHS poverty guidelines for 1999 are \$8,240 for a one-person family, \$11,060 for two-person families, \$13,880 for three person families, and \$16,700 for four-person families. Scholz and Levine (2000), for example, calculate, using the April 1997 SIPP, that over 60 percent of EITC payments go to taxpayers with pre-EITC incomes below the poverty line and roughly half of total payments directly reduce the poverty gap. In unpublished calculations by Richard Bavier at OMB, 49 percent of EITC payments were made to taxpayers with pre-EITC incomes below the poverty line in the 1998 CPS.

¹⁴ These calculations were made with the use of Internet TAXSIM, developed by Daniel Feenberg at the NBER. See Feenberg and Coutts (1993) for more information.

Figure 2a:
Taxes and Marginal Rates, Family of 4, California, 1984

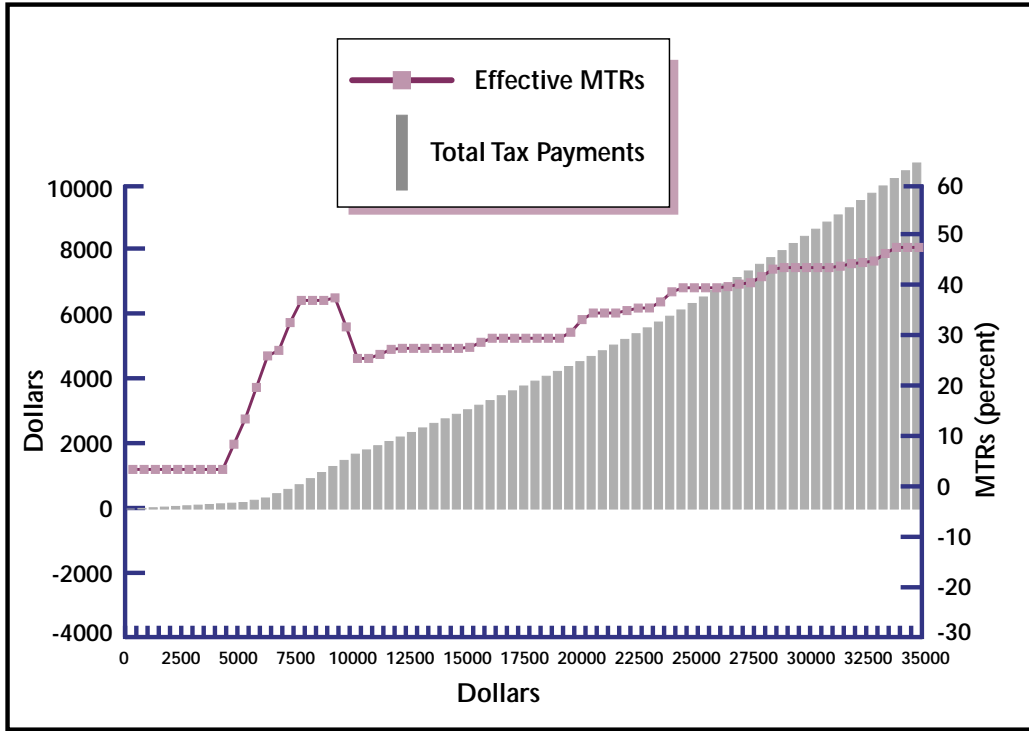
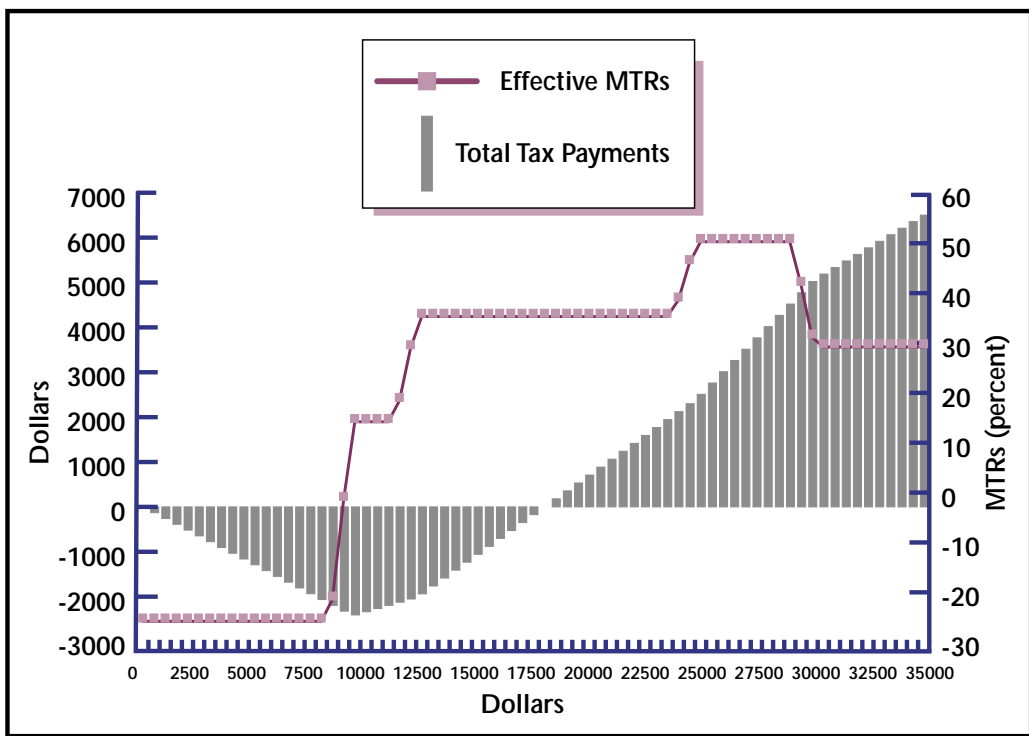


Figure 2b:
Taxes and Marginal Rates, Family of 4, California, 1998



therefore, the employer and employee share of payroll taxes was 13.1 percent.¹⁵ The EITC was only 10 percent on incomes up to \$5,000; therefore, the payroll tax exceeded the EITC for taxpayers with very low incomes. The EITC was phased out at a 12.5 percent rate beginning at \$6,000. In addition, the 11 percent federal marginal tax bracket started at around \$6,000 of income. Thus, all but the lowest income families faced marginal tax rates of at least 28 percent. Some were significantly higher. Total tax payments are positive at all income levels.

Figure 2b shows the analogous figure for 1998, after the 1986 tax reform, and the 1990 and 1993 EITC expansions. The pattern of marginal and average tax rates in 1998 is strikingly more favorable to low-income workers compared with 1984. The marginal tax rate line is initially at -25.8 percent, reflecting the sum of the 14.2 percent effective payroll tax rate (the employer and employee payroll tax rates are now 7.65 percent) and the -40 percent EITC rate. The EITC subsidy ends at approximately \$10,000, leading to positive cumulative rates first equal to the 14.2 percent effective payroll tax rate and then 35.3 percent, reflecting the sum of the 14.2 percent payroll tax and the 21.1 percent EITC phase-out. Rates jump to 50.3 between \$25,000 and \$29,000 as the family enters the 15 percent bracket of the federal income tax.¹⁶ California state income taxes are zero for all EITC-eligible households. The corresponding average tax burdens are shown in the bars. Two-parent, two-child California families would have negative combined income and payroll taxes up to roughly \$17,200.¹⁷ One might expect EITC-induced changes in the return to work to increase labor force participation between the mid-1980s and the late 1990s, other things being equal.

A number of studies have examined the labor market effects of the EITC.¹⁸ Dickert, Houser, and Scholz (1995) measure employment elasticities using data from the 1990 SIPP. They develop a simulation model to characterize the variation in budget sets that families face in different states. The intuition underlying the study is that in high-benefit states (such as New York at the time), the after-tax return to work is fairly low because substantial benefits are clawed back, while in low-benefit states (such as Texas at the time), the after-tax return to work is high because there are few benefits to lose. Thus, if labor market participation decisions are sensitive to the after-tax returns to work, participation rates should be higher in low-benefit states than high-benefit states, all else being equal. They find that a 10 percent increase in the after-tax wage results in a 2 percentage point (or 3.5 percent) increase in labor market participation among single parents. They also show the participation of secondary wage earners likely falls as a consequence of the EITC.

¹⁵ Employers and employees both contributed 7 percent of earnings as payroll taxes, but the incidence assumption implies that after-tax earnings would be 7 percent larger in the absence of payroll taxes, so the effective payroll tax rate was $(.14 / 1.07)$, or 13.1 percent.

¹⁶ The EITC phase-out rate is lower for taxpayers with one child, but because they only receive one child credit and have one fewer personal exemption, one-child families begin to pay the federal 15 percent marginal income tax rate at an income of roughly \$19,000. Hence, EITC recipients with one child and incomes between \$19,000 and \$27,000 have cumulative marginal tax rates nearing or above 50 percent.

¹⁷ Low-income families would generally file returns because their incomes exceed filing thresholds or to get back withheld taxes. With the \$500 child credit along with exemptions of \$2,250 and the standard deduction of \$7,200, a married couple with two children will not have a positive income tax liability until their earnings exceed \$24,866, even without the EITC, but they will be required to file a tax return as long as their income exceeds \$11,700.

¹⁸ See Hotz and Scholz (2000a) for a more detailed discussion of the existing EITC empirical literature.

Eissa and Liebman (1996) examine the 1986 EITC expansion to estimate its effects on the employment of single women and, conditional on working, their hours of work. To isolate those affected by the policy from those who are not, they treat single women with children as their experimental group and single women without children as their control group. They find that the 1986 tax reform (including the EITC changes) increased employment among all single women with children by as much as 2.8 percentage points (from a base of 74.2 percent). The effects are much larger (on the order of 6 percentage points) for women with children and less than a high school education.¹⁹

Ellwood (1999) also exploits the difference-in-differences approach, classifying parents according to their position in the distribution of predicted wages and then comparing women in the lowest (predicted) wage quartile with those in higher quartiles to distinguish groups who are likely to be affected by the EITC (the lowest quartile) with those who are not (the higher quartiles). His qualified conclusion, noted in our introduction, is that welfare reform accounts for roughly half of the changing employment of female-headed families, the EITC and other work supports account for roughly 30 percent, and the strong economy accounts for the remainder.

Meyer and Rosenbaum (1999) significantly advance the literature in their analysis of the effects of the EITC and other policy changes on the employment of single women. Their approach more explicitly accounts for the actual EITC changes that occurred over the last two decades than other studies in the literature. This is in contrast to the difference-in-difference approach, which tries to identify the behavioral effects of the EITC off the timing of the EITC changes and differences in eligibility for the EITC for various groups in the population (e.g., single women without children). Second, their method nets out the influence of changes in other policies, both over time and across place-of-residence in order to isolate the influence of the EITC. Dealing with the influence of other policy changes is potentially important, especially to the extent that such changes had different impacts on households with and without children. The existence of these latter effects is a potential source of bias in the difference-in-difference estimators used by others to identify the effects of various EITC expansions.

The Meyer and Rosenbaum employment estimates span 1984–1996 for single women. They find that EITC changes account for 63 percent of the increase in the employment rate of single mothers from 1984 to 1996 and 37 percent of the increase from 1992 to 1996. Using a different approach Keane and Moffitt (1998) and Keane (1995, based on the Keane and Moffitt model) explicitly parameterize the preferences and constraints facing individuals and then exploit the theory of optimal decision-making to characterize the likelihood function that is used to reconcile observed labor supply and program participation behaviors. Their empirical results are used to examine a wide range of policy reforms, including changes to AFDC and Food Stamp tax rates, a variety of wage and work subsidies, and changes to the EITC. Their EITC simulations find that the expansions between 1984 and 1996 increased employment by 10.7 percentage points, from a base of 65.4 percent. They also find the aggregate effect of the EITC expansions over this period was to increase hours of work.

¹⁹ Eissa and Hoynes (1998) use a similar strategy to estimate the effects of the 1993 EITC expansion on employment. They also use a difference-in-difference estimator in which women with two or more children serve as the treatment group and households with only one child constitute their control group. In this latter case, they are estimating the average effect of the differential expansion of the EITC by numbers of children. In general, they find modest negative effects of the EITC on married women's employment, estimating the EITC expansions between 1984 and 1996 reduced the likelihood of labor market participation by around 1.2 percentage points (or 2 percent).

These studies employ different approaches but reach strikingly consistent results. As reported in Hotz and Scholz (2000a, Table 4), the studies imply elasticities of employment with respect to net income that range from 0.69 to 1.16.²⁰ Elasticities of this magnitude imply that wage subsidies such as the EITC can substantially increase employment.

Our paper adds to the literature on the effects of the EITC on the employment of low-income workers in three primary ways. First, it is the first EITC paper to use data other than the CPS or SIPP. By all accounts the SIPP and CPS are high quality, but over time, there appears to have been an erosion of their coverage of program participation, and their sampling frames make it difficult to account in a detailed way for local labor market conditions and welfare rules and institutions that may affect the employment of low-income workers. Second, ours is the first EITC paper to use experimental variation to account for the effect of altering the benefit package available to welfare recipients. Ours is also the first paper to focus on a population of welfare recipients, which allows us to explicitly examine the effects of the EITC in helping people move from welfare to work. Of course, our focus on welfare recipients also raises methodological concerns given that entry into welfare (and hence our sample) may be driven by observable and unobservable factors. As we discuss in greater detail below, we address problems that might arise from the influence of unobservables in two primary ways. We examine the robustness of our results to a different point-in-time sample and to a sample of new entrants, conditioning on observable characteristics. We also use information on prior earnings and welfare use to try to proxy for underlying employment propensities of our sample.

The California Work Pays Demonstration Project

In 1992 and 1993, California altered several aspects of its AFDC program, including reducing available cash benefits. Because AFDC benefit reductions were greater than federal regulations allowed, the state was required to obtain a federal waiver. The waiver included an evaluation, which led to the California Work Pays Demonstration Project (CWDPD). Data on AFDC and Food Stamp participation for aid recipients in four counties—Alameda, Los Angeles, San Bernardino, and San Joaquin—were gathered in the County Welfare Administrative Database (CWAD).

The four counties chosen as research counties for the CWDPD have distinct characteristics relating to their geography, populations, welfare caseloads, and welfare departments. Los Angeles and Alameda counties contain major urban centers, and San Joaquin and San Bernardino counties are their neighboring rural areas. San Joaquin represents the agricultural region known as the Central Valley, while San Bernardino is part of southern California's desert region and is the geographically largest of the four counties. Los Angeles County has the largest population of any California county, with nearly 9 million residents in 1990. San Bernardino and Alameda Counties each have 1.2–1.5 million residents, and San Joaquin has approximately 500,000 residents. Not surprisingly, Los Angeles County has the highest welfare caseload, with more than 285,000 cases in 1992; the other three counties have caseloads in the 30,000–60,000 range. San Joaquin's caseload is the smallest. However, of the three counties in 1990, San Joaquin County reported the highest percentage of its population receiving AFDC. In addition, San Joaquin County has an unusually high percentage of unemployed parent cases (20 percent). Unemployed parent cases make up 10–15 percent of the caseloads in the other three counties.

²⁰ We were not able to compute an employment elasticity from Ellwood's study that is methodologically comparable to elasticities from the other studies.

The sampling of cases for the CWPDP evaluation in these four counties began in December 1992; 15,000 AFDC cases in the four counties were randomly selected to be a part of the study. One-third of these cases were assigned to a control group that was subject to the provisions of the state's AFDC program, including benefit levels, that were in place as of September 1992. Two-thirds were assigned to the treatment group that, along with AFDC recipients, was subject to the changes in the state's AFDC program granted by the federal government under several waivers. A sample of the new cases that entered the AFDC caseloads in the four analysis counties also was drawn and randomly assigned to either the control or treatment statuses beginning in 1993. Thus, the full CWPDP sample consists of households receiving AFDC in October 1992 and the 1993–1997 replenishment, or “new entrant,” cases.

The CWPDP continued until the latter part of the 1990s. On passage of PRWORA, all states had the option to continue their waiver demonstrations or terminate them. California chose to stop enrolling new entrants into the CWPDP as of March 1997 and, with the passage of California's welfare reform program, CalWORKs, the CWPDP was concluded at the end of December 1997. Beginning in January 1998, all households in the CWPDP, including control group members, were subject to the provisions of California's TANF program and the other provisions of CalWORKs.

The CWPDP Sample and Data

In the empirical analysis that follows, we distinguish between two groups, or subsamples, within the overall sample generated for the CWPDP. We first define a point-in-time sample as all households in the October 1992 sample that are continuing welfare recipients. The second is a sample of new entrants to AFDC. These new entrants are recent entrants in any year from 1992–1997. The new entrant cases, when added to the point-in-time sample, can be used to define the caseload at any time.

Cases in the point-in-time sample overrepresent long-term welfare recipients, at least relative to the new entrants samples. Although some fraction of the households in the new entrants sample eventually may become long-term recipients, the majority of new entrants leave the welfare rolls in a relatively short time. Given compositional differences between the two samples, we might observe different labor force participation responses to the EITC, welfare provisions, and local labor market conditions across samples.

Our household data come from several sources. Data on the demographic characteristics of families and individuals come from the County Welfare Administrative Database. We also use data on welfare participation prior to enrollment in the CWPDP that come from California's Medi-Cal Eligibility Data System (MEDS).²¹ MEDS provides AFDC participation histories of individuals in the CWPDP sample from 1987 until their entry into the CWPDP.

We measure labor force participation using quarterly data on employment (and earnings) from the California Employment Development Department (EDD) Base Wage Files. The EDD Base Wage File contains employer-reported taxable wage payments for jobs covered by

²¹ The MEDS is a statewide administrative system that contains information on monthly participation in the state's Medicaid program (Medi-Cal), AFDC/TANF programs, as well as the Food Stamps, Supplemental Security Income (SSI), and California's General Assistance (GA) programs.

Unemployment Insurance (UI) and disability insurance (DI).²² Hotz and Scholz (2000b) provide an extended discussion of what is known about the accuracy and coverage of UI data for the low-income population. In brief, UI data do not cover all workers, including the self-employed, military, federal employees, independent contractors and other employment arrangements. Nevertheless, employment rates derived from UI data appear to be similar to those that result from survey data. We expect UI-based employment rates to be lower because of coverage problems with flexible workers and independent contractors. Surveys also suffer from nonresponse, however; therefore, undercounts in both data sources typically are comparable in the studies we reviewed, making the UI-based rates similar to survey-based rates.

Two overall sample restrictions are necessary due to gaps or inconsistencies in the data. First, data in the CWAD are maintained for persons who were in a case at the time of sampling as well as for persons who enter a case after the sampling date. Persons in this latter group were not submitted for a match to Base Wage File records; we exclude these persons from our analysis because we cannot observe their earnings. Second, administrative difficulties in San Joaquin County resulted in incomplete information for the treatment cases. We also exclude these cases from the analysis.

Beyond these overall sample restrictions, other sample complications arise. First, between 23 percent and 38 percent of the sample are households in which no adult is a member of the AFDC assistance unit.²³ These child-only cases occur when the children are eligible for AFDC but the adults who live with the children are ineligible. The adults may be undocumented workers or may have been sanctioned for violating program regulations. We eliminate these child-only cases from our analysis sample because we do not have Base Wage File earnings for the adults in the household. Furthermore, the children in these cases are likely ineligible for the EITC: even if a child had earnings, that child is not eligible to claim the EITC if she is a qualifying child for EITC purposes of another person. Consequently, we eliminate all children from the sample, leaving only adults.

Second, depending on the subsample, 0–5 percent of the households have three or more adults in the AFDC assistance unit at the time of sampling. These “complex” households are a potentially interesting group to study given that the possibility for manipulating family structure in order to access different sources of money would seem to be the greatest for this group. However, we drop these households from our analysis because they may represent multigenerational families, and we have limited information (and often no reliable information) about relationships among assistance unit members. Without knowing more about family relationships, we are unable to construct useful decision rules about which adult can claim a child for purposes of the EITC.²⁴

²² The file generally includes individuals paid wages of more than \$100 in a calendar quarter, and domestic workers paid cash wages more than \$750 in a calendar quarter. As noted in the text, certain types of workers are exempt from UI/DI coverage and are not included in the Base Wage File.

²³ We define a child as being 18 years old or younger throughout the year. This age limit corresponds to the age of a qualifying child for EITC purposes. The range noted in the text arises from differences across our subsamples. Thirty-eight percent of the FG cases in the 1993 new entrant sample are child only cases while 23 percent of the U cases in the 1992 sample were child only.

²⁴ We also did not include those cases for which we were unable to determine the date at which they entered the CWPDP. In addition, we deleted those individuals whose were missing a date of birth when we constructed our measures of whether any adults in an assistance unit worked.

CWPDP Sample Characteristics

Table 2 shows the characteristics of our samples after the restrictions are imposed. Roughly, two-thirds of the households are AFDC-FG (single parent) cases, with the remainder being AFDC-U (unemployed parent) cases. The ethnic and racial composition of the cases varies by AFDC status (FG versus U) at the time of their enrollment in the CWPDP, with blacks more prevalent in AFDC-FG cases while AFDC-U cases are more likely to be white, Hispanic, or Asian. AFDC-U cases also have more children in the assistance unit at the time of enrollment. Anticipating our analysis of the effects of the EITC on employment, a sizable share of the cases in the CWPDP had two or more children at the time of enrollment. The percentages range from 49.6 percent for AFDC-FG cases in the new entrant sample to 82.5 percent of the AFDC-U cases in the point-in-time sample. Finally, at the bottom of Table 2 are the percentage of cases in which we were able to match cases in UI/EDD earnings records, the data that we use to measure employment. Across AFDC statuses and types of samples, we find very high match rates.

Table 2:
Sample Characteristics for the California Work Pays Demonstration Project

<i>Variables</i>	Point-in-Time (October 1992)		New Entrants	
	<i>AFDC-FG Cases</i>	<i>AFDC-U Cases</i>	<i>AFDC-FG Cases</i>	<i>AFDC-U Cases</i>
<i>Cases in Samples</i>	5,102	2,401	3,040	2,070
<i>Adults in Samples</i>	5,750	4,726	3,433	3,771
<i>Distn. of Cases by No. of Adults:</i>				
1 Adult	62.3%	3.6%	57.7%	6.6%
2 Adults	37.7%	96.4%	42.3%	93.4%
<i>Distn. of Cases by No. of Children:</i>				
0 Children	1.2%	0.3%	7.5%	3.7%
1 Child	36.0%	17.2%	42.9%	28.9%
2 Children	29.7%	33.3%	26.6%	35.0%
3+ Children	33.1%	49.2%	23.0%	32.4%
<i>% of Adults in Case that are Male</i>	5.6%	48.7%	9.1%	49.5%
<i>Ethnic/Racial Composition of Cases:</i>				
White	26.2%	40.4%	33.0%	40.5%
Hispanic	24.7%	19.2%	29.2%	36.9%
Black	40.9%	7.3%	31.4%	8.0%
Asian	7.7%	32.9%	6.0%	14.2%
<i>% of Cases with UI Earnings Match</i>	98.4%	99.5%	96.6%	98.8%

Welfare Provisions Faced by CWPDP Experimental and Control Groups, 1992–1997

In this section, we briefly describe the provisions of the welfare system that prevailed in California during the period of the CWPDP. As noted above, California was granted a series of waivers to its AFDC program by the U.S. Department of Health and Human Services during the early part of the 1990s. The waivers allowed the following changes:

- Reduced the maximum AFDC payment by a total of 15 percent.
- Eliminated the 100-hour (per month) work limitation for AFDC-U eligibility: This change does not affect the eligibility for the AFDC Unemployed Parent program (AFDC-U), but does affect conditions under which one remains eligible. This change affected only AFDC-U cases; the rule was not in effect for AFDC-FG cases.
- Removed time limit for \$30 and 1/3 income disregard: This change became effective in July 1993. Prior law required that if AFDC recipients earned income after four months on AFDC, they were subject to a 100 percent benefit reduction rate (BRR). The new law removed the four-month time limit and allowed eligible AFDC recipients to keep \$30 plus one-third of their earnings.
- Implemented the Cal-Learn program: This program encouraged pregnant teens and teen parents to stay in or return to school by providing child care, transportation, and other assistance, and by creating incentives to keep grades up and to stay in school.
- Increased the personal resource limits and allowance of savings accounts for education: This provision raised the limits on personal resources and automobile stock that AFDC recipients could hold and remain eligible for AFDC. It allows recipients to retain up to \$5,000 per family in a restricted account to be used for a child's postsecondary education, for down payment on a home, or for starting a business. These new rules do not apply to resources allowed at the time of eligibility determination, in which case the old rules still apply.
- Implemented the California Alternative Assistance Program (CAAP): This provision enables AFDC-eligible persons to decline an AFDC cash grant but still receive Medi-Cal (the Medicaid program in California) and child care assistance.
- Changed employment services programs: Several provisions were implemented to make California's Job Opportunities and Basic Skills (JOBS) training program and the Greater Avenues for Independence (GAIN) program more work-oriented.

The treatment group in the CWPDP, as well as the AFDC caseload in the rest of the state, was subject to the above changes over the period we analyze. As a result, any experimental-control outcome comparison for the CWPDP sample reflects the combined effect of the bundle of changes noted above. Thus, we are unable to distinguish between the effects of the reduction in the maximum aid payments (i.e., the AFDC guarantee levels) and the benefit reduction rates. Nor can we distinguish the latter two features from the other changes that were made under the CWPDP. Nonetheless, we note that static models of labor supply would predict, under reasonable assumptions about income and substitution effect,²⁵ that the combination of the *reduction* in the guaranteed levels of AFDC benefits and the *elimination* of the time limits on

²⁵ In particular, the assumptions would be that the effect of an increase in income, all else equal, reduces an individual's labor supply and propensity to participate and that the substitution effects associated with a wage change dominate the income effects of such a change.

33 percent benefit reduction rate would tend to increase the propensity of adults on welfare to work. Furthermore, we note that the second and third provisions in this waiver only applied to AFDC-U cases, reinforcing the notion that the primary changes confronting one-parent (AFDC-FG) households were the reduction in the welfare benefit guarantee and the reduction in the benefit reduction rates.

Low-income households in California (and elsewhere) are potentially eligible for other social assistance programs that may affect their decisions to work. These other programs, such as Medi-Cal, Food Stamps, and Supplemental Security Income (SSI), did not change much or at all over this period. They also generally did not vary across California's 58 counties. Thus, we

Table 3:
Distribution of Average Monthly Participation in Various GAIN Activities in the CWPDP Counties, 1992-1997

[Source: GAIN25 Data, State of California]

Year	Job Club & Job Search Activities	All Other Job Search Activities	Basic Education Programs	Vocational Training	On The Job Training	Pre-Employment Preparation	Supported Work & Transitional Employment
Alameda							
1992	16%	11%	29%	31%	0%	12%	0%
1993	19%	10%	28%	32%	0%	11%	0%
1994	23%	6%	29%	34%	0%	8%	0%
1995	19%	22%	22%	26%	0%	11%	0%
1996	49%	12%	15%	13%	0%	11%	0%
1997	52%	14%	5%	22%	0%	7%	0%
Los Angeles							
1992	29%	4%	45%	20%	0%	0%	0%
1993	24%	3%	49%	22%	0%	2%	0%
1994	42%	4%	31%	19%	0%	2%	0%
1995	61%	7%	16%	12%	0%	4%	0%
1996	71%	3%	10%	11%	0%	5%	0%
1997	77%	0%	7%	9%	0%	6%	0%
San Bernardino							
1992	27%	21%	36%	10%	0%	5%	0%
1993	30%	19%	37%	10%	0%	4%	0%
1994	40%	19%	27%	10%	0%	3%	0%
1995	49%	21%	21%	4%	0%	4%	0%
1996	57%	24%	12%	2%	0%	5%	0%
1997	58%	26%	4%	5%	0%	7%	0%
San Joaquin							
1992	14%	6%	48%	16%	9%	7%	0%
1993	12%	11%	48%	18%	6%	5%	0%
1994	13%	10%	44%	15%	8%	9%	0%
1995	10%	10%	40%	12%	18%	10%	0%
1996	20%	8%	27%	11%	20%	13%	0%
1997	33%	8%	13%	11%	22%	12%	0%

have a limited ability to examine the effects of other programs on the labor force participation of CWPDP sample members. One exception arises with the welfare-to-work program, GAIN, that prevailed in California during the period we analyze. Although the program was implemented statewide, it was administered at the county level. Consequently counties implemented different programs and were free to change them over this period.²⁶

Tables 3 and 4 provide statistics on two sets of indicators that highlight GAIN implementation differences in our four analysis counties. Table 3 shows the distributions of welfare-to-work activities across counties and years. There are substantial differences. In 1992 most recipients in Alameda County were assigned to vocational training. By 1997, they emphasized job club and job search activities. Los Angeles County emphasized basic education programs in 1992. By 1997, they too emphasized job club and job search activities. In Table 4, we display the average monthly GAIN enrollments, by county, as a percentage of each county’s AFDC caseload. Again, one sees that the GAIN programs in these counties differed in the extent to which they served the AFDC population. We use these indicators in our multivariate analyses to account for welfare program differences confronting adults in the CWPDP sample.

Table 4:
Average per Month Enrollment in GAIN as Percentage of Total AFDC Enrollment in the CWPDP Counties, 1992-1997
 [Source: GAIN25 Data, State of California]

Year	Alameda	Los Angeles	San Bernardino	San Joaquin
1992	7%	9%	16%	27%
1993	8%	10%	9%	26%
1994	10%	14%	13%	24%
1995	7%	13%	19%	27%
1996	10%	13%	20%	31%
1997	17%	18%	24%	39%

Local Labor Markets

As noted in the introduction, some of the changes in welfare caseloads and employment rates of low-skilled workers during the 1990s may be attributed to changes in the labor market conditions. To account for the role of the economy, we examine several labor market characteristics, including the overall employment rate in the county; the share of employment in manufacturing, service, and retail trade; and income per worker in each sector. The trends and differences across counties in these measures are presented in Figures 3–7.²⁷ As is clear from these figures, labor market conditions varied over the period covered by our sample.

Employment growth rates were strong in the second half of 1980s, but starting in 1991, California experienced a severe economic downturn. A natural concern is that these cyclical effects could account for employment changes in the sample. The figures also illustrate the fact that the 1991 recession appears to have affected different parts of the state differently. In particular, Los Angeles County experienced the deepest downturns and some of the most rapid

²⁶ For more on the GAIN program and the differences in its implementation in California’s counties, see Riccio et al. (1989) and Hotz, Imbens, and Klerman (2000).
²⁷ These data were obtained from the website of the Labor Market Information Division (LMID) of the State of California’s Economic Development Department.

rates of recovery as measured by changes in employment across the various sectors. The one exception to this pattern was in changes in government employment, which includes employment at military installations. The rates of decline in employment were highest in Alameda and San Bernardino counties, with the latter county still experiencing employment declines in this sector as late as 1998. Thus, another important feature of the temporal variation is that it was different across regions within the state.

We account for these local labor market factors in our empirical model of employment.

Figure 3
Annual Employment to Population Ratios, 1984 - 1998

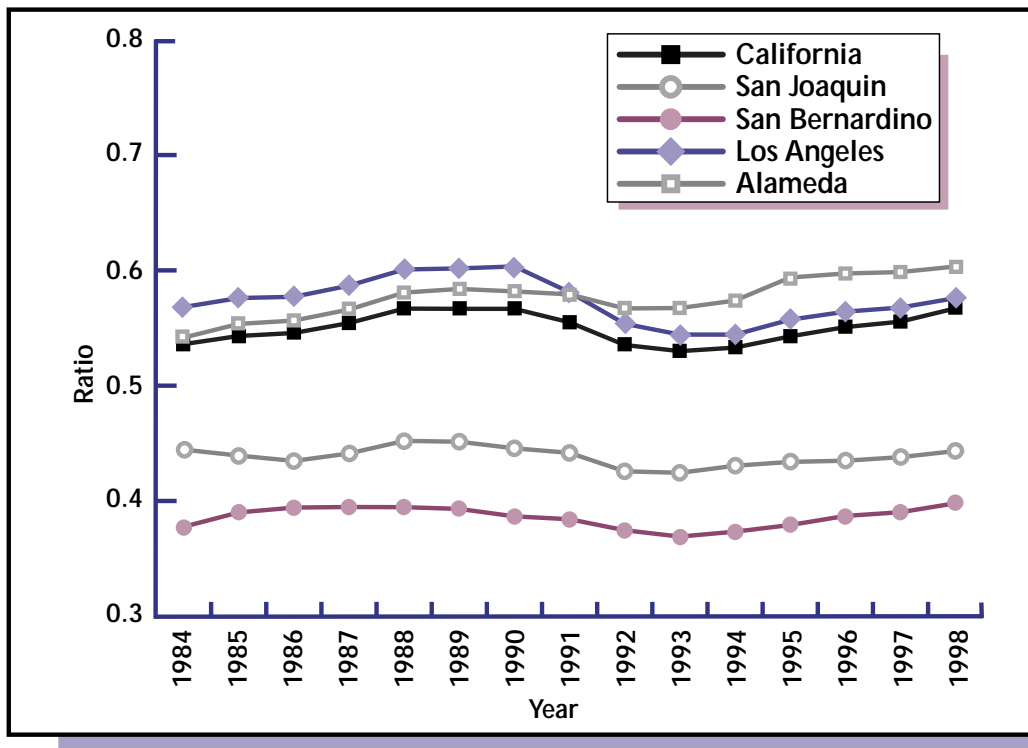


FIGURE 4

Annual Growth Rates in Employment: All Industries, 1985 - 1998

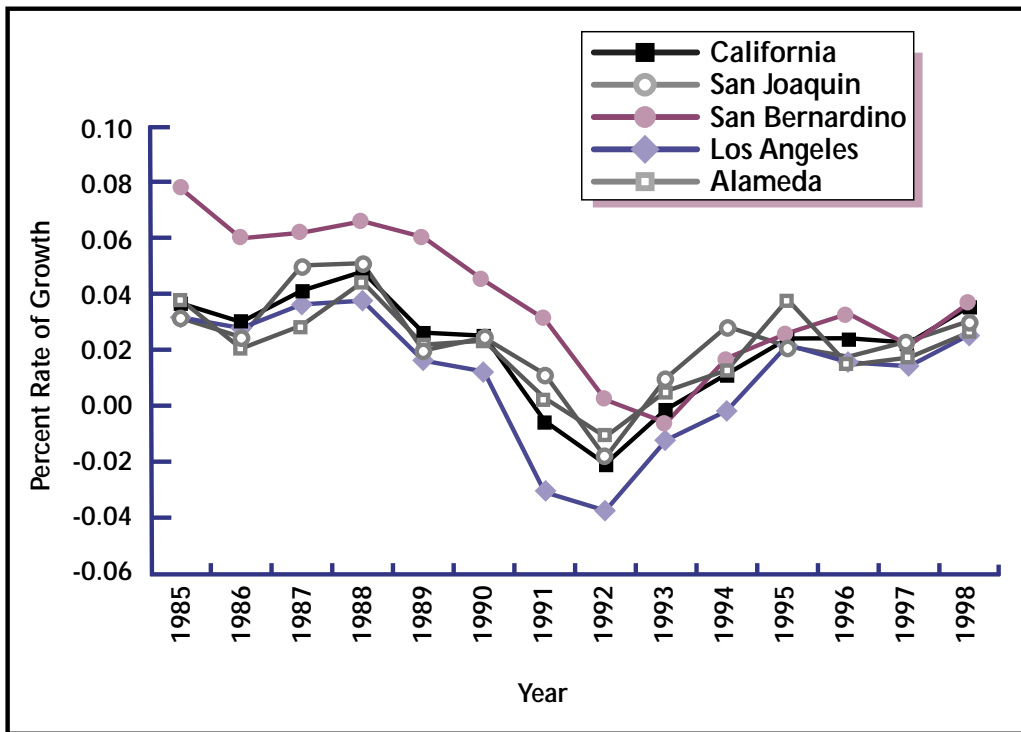


Figure 5

Annual Growth Rates in Employment: Manufacturing, 1985 - 1998

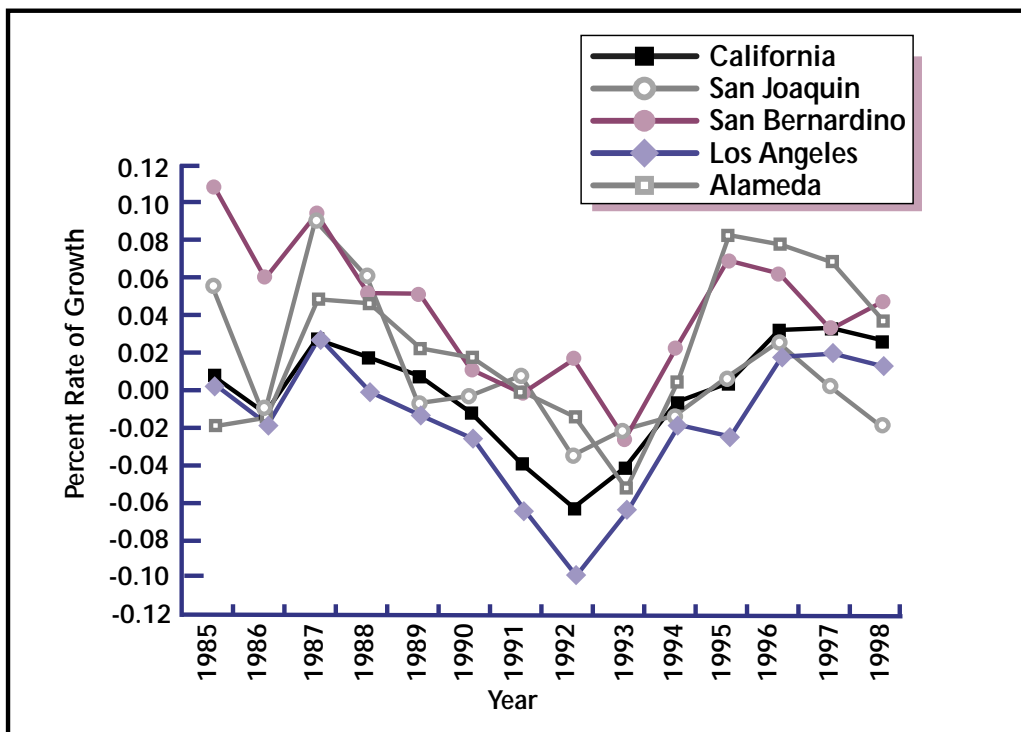


Figure 6

Annual Growth Rates in Employment: Services, 1985 - 1998

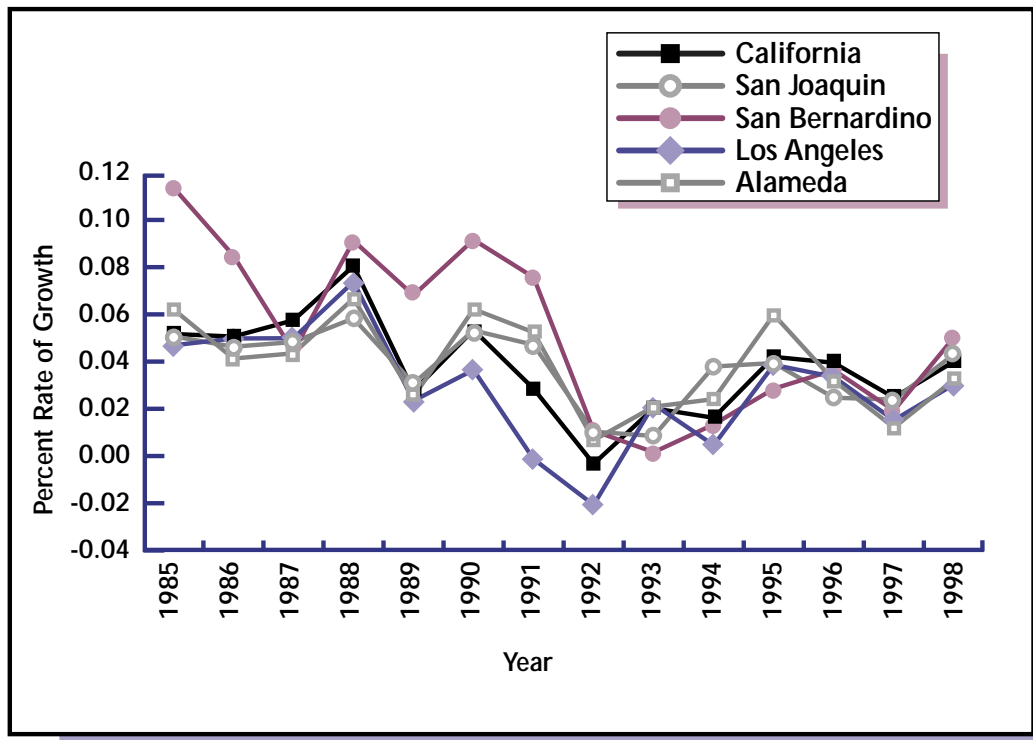
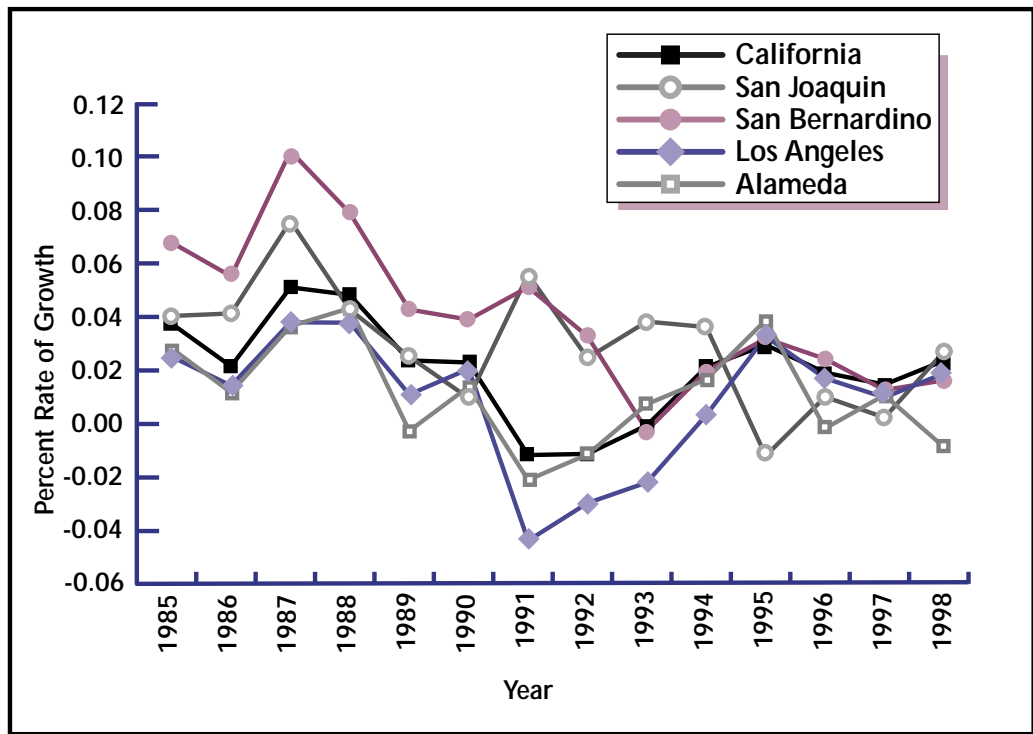


Figure 7

Annual Growth Rates in Employment: Retail Trade, 1985 - 1998



The Trends and Patterns in Employment Rates for the Welfare Population

Our empirical work focuses on the effects of welfare changes, local labor markets and the EITC on employment. We start the analysis with two tables that highlight in a simple way the data that we use for the analysis and the empirical patterns that are present.

Employment Rate Trends and Differences across the CWPDP Experimental and Control Groups

Panels A and B of Table 5 show treatment-control differences in employment rates for AFDC-FG and AFDC-U families between 1993–1998 for our two samples: the point-in-time (as of October 1992) sample and the new entrants sample. Several trends stand out. First, the employment rates of both experimental and control group members increase throughout the 1990s in both samples. Second, in the point-in-time sample, the treatment group tends to have higher employment rates than the control group, and these differences grew and were more likely to be statistically significant toward the end of the sample period. These patterns do not hold for our new entrants sample (panel B). This difference across our samples raises the possibility that the composition of the caseload may have changed over the period we consider. We analyze this issue in more detail below.

The EITC

Panels A and B of Table 6 present descriptive statistics that highlight the intuition for our examination of the EITC. Panel A corresponds to the point-in-time sample and panel B corresponds to the new entrants sample. In each panel, we split the sample into families with one child and families with two or more children. Absent cohort or welfare entry effects—a major qualification that we address in the following sections—we expect, if the EITC stimulates employment, to see higher employment for two-plus-child families relative to one-child families as the EITC differential between the two types of families increases beginning in 1994.

As can be seen in the panels of Table 6, changes in employment rates before and after 1994 suggest that the EITC expansion may have had a significant, positive effect on the employment rates. In particular, participation rates for families with two or more children rise steadily and by 1997 and 1998, have increased 6 (8) percentage points relative to the participation rates of one-child families in the AFDC-FG (AFDC-U) sample. Both estimates are significant at usual levels. The difference-in-difference estimates show similar patterns in the new entrants sample, but they are smaller and less precisely estimated. Of course, these patterns may be the result of other factors changing over this period, including the economy, the welfare system, and compositional issues related to entry and exit of our sample. We refine our analysis of these effects in the next section.

Multivariate Analysis of Relative Effects of EITC, Welfare, and Labor Market Conditions

In this section, we present a more refined analysis of the relative effects on labor force participation of the EITC expansions, the provisions of California's welfare and welfare-to-work systems, and local labor market conditions using the CWPDP data. We begin by outlining the empirical model and estimation strategy that we employ.

Table 5:
Employment Rates (%) for Treatments and Controls, 1993-1998
Panel A: Point-in-Time (October 1992) Sample

Year	AFDC-FG Cases			AFDC-U Cases		
	Experimentals	Controls	Difference	Experimentals	Controls	Difference
1993	27.59 (0.81)	26.93 (0.98)	0.66 (1.27)	31.67 (1.22)	29.94 (1.49)	1.73 (1.93)
1994	33.26 (0.86)	32.11 (1.03)	1.15 (1.34)	39.20 (1.28)	35.99 (1.56)	3.21 (2.02)
1995	38.17 (0.88)	35.15 (1.05)	3.02** (1.37)	45.10 (1.30)	42.36 (1.61)	2.74 (2.07)
1996	42.45 (0.90)	37.72 (1.07)	4.73*** (1.39)	50.10 (1.31)	43.95 (1.62)	6.15*** (2.08)
1997	46.34 (0.91)	41.30 (1.08)	5.04*** (1.41)	57.23 (1.30)	52.65 (1.63)	4.58** (2.08)
1998	45.88 (0.90)	41.83 (1.08)	4.05*** (1.41)	57.98 (1.29)	54.35 (1.62)	3.63* (2.07)
N	3,034	2,068		1,459	942	

Notes: Standard errors in parentheses.
 * denotes statistically significant at 10% level
 ** denotes statistically significant at 5% level
 *** denotes statistically significant at 1% level.

Panel B: New Entrants Sample

Year	AFDC-FG Cases			AFDC-U Cases		
	Experimentals	Controls	Difference	Experimentals	Controls	Difference
1993	31.42 (1.59)	30.05 (1.86)	1.37 (2.44)	38.34 (2.19)	33.75 (2.66)	4.59 (3.44)
N	853	609		493	317	
1994	37.60 (1.38)	33.21 (1.62)	4.39** (2.13)	48.21 (1.75)	45.42 (2.27)	2.79 (2.87)
N	1,226	840		811	480	
1995	40.38 (1.30)	37.77 (1.56)	2.61 (2.04)	53.33 (1.58)	50.59 (2.06)	2.74 (2.60)
N	1,419	961		992	589	
1996	42.47 (1.23)	41.28 (1.49)	1.19 (1.93)	56.22 (1.47)	51.76 (1.91)	4.46* (2.41)
N	1,620	1,095		1,142	682	
1997	42.10 (1.16)	43.01 (1.41)	-0.91 (1.83)	55.13 (1.38)	54.97 (1.80)	0.16 (2.27)
N	1,803	1,237		1,306	764	
1998	39.88 (1.15)	40.66 (1.40)	-0.78 (1.81)	52.22 (1.38)	51.83 (1.81)	0.39 (2.28)
N	1,803	1,237		1,306	764	

Notes: Sample sizes increase over time as new entrants are added to the AFDC caseload.
 Standard errors in parentheses.
 * denotes statistically significant at 10% level
 ** denotes statistically significant at 5% level
 *** denotes statistically significant at 1% level.

Table 6:
Employment Rates (%) by Family Size, 1993-1998
Panel A: Point-in-Time (October 1992) Sample

Year	AFDC-FG Cases				AFDC-U Cases			
	One child	2+ Children	Difference (2+ - One)	Diff in Diff (199X - 1993)	One child	2+ Children	Difference (2+ - One)	Diff in Diff (199X - 1993)
1993	33.13 (1.10)	24.02 (0.75)	-9.11*** (1.33)		38.35 (2.40)	29.47 (1.02)	-8.88*** (2.61)	
1994	36.72 (1.12)	30.48 (0.81)	-6.24*** (1.39)	2.87 (1.92)	44.17 (2.45)	36.78 (1.08)	-7.39*** (2.68)	1.49 (3.73)
1995	40.81 (1.15)	34.60 (0.84)	-6.21*** (1.42)	2.90 (1.95)	48.30 (2.46)	43.19 (1.11)	-5.11* (2.70)	3.77 (3.75)
1996	43.74 (1.16)	38.69 (0.86)	-5.05*** (1.44)	4.06** (1.96)	51.46 (2.46)	46.92 (1.12)	-4.54* (2.71)	4.34 (3.76)
1997	45.81 (1.16)	43.56 (0.88)	-2.25 (1.46)	6.86*** (1.97)	56.07 (2.45)	55.30 (1.12)	-0.77 (2.69)	8.11** (3.74)
1998	46.08 (1.16)	43.21 (0.88)	-2.87** (1.46)	6.24*** (1.97)	56.55 (2.44)	56.61 (1.11)	0.06 (2.68)	8.94** (3.74)
N	1,838	3,205			412	1,982		

Notes: Standard errors in parentheses

* denotes statistically significant at 10% level;

** denotes statistically significant at 5% level;

*** denotes statistically significant at 1% level.

Panel B: New Entrants Sample

Year	AFDC-FG Cases				AFDC-U Cases			
	One child	2+ Children	Difference (2+ - One)	Diff in Diff (199X - 1993)	One child	2+ Children	Difference (2+ - One)	Diff in Diff (199X - 1993)
1993	42.21 (1.37)	36.01 (1.24)	-6.20*** (1.84)		51.75 (2.04)	49.68 (1.34)	-2.07 (2.44)	
1994	44.90 (1.38)	36.94 (1.24)	-7.96*** (1.86)	-1.76 (2.62)	53.42 (2.04)	53.12 (1.34)	-0.30 (2.44)	1.77 (3.45)
1995	43.05 (1.37)	40.32 (1.26)	-2.73 (1.86)	3.47 (2.62)	56.43 (2.03)	55.63 (1.33)	-0.80 (2.42)	1.27 (3.44)
1996	44.13 (1.38)	41.25 (1.27)	-2.88 (1.87)	3.32 (2.63)	54.09 (2.04)	57.35 (1.32)	3.26 (2.43)	5.33 (3.44)
1997	44.59 (1.38)	41.78 (1.27)	-2.81 (1.87)	3.39 (2.63)	52.75 (2.04)	57.20 (1.32)	4.45* (2.43)	6.52* (3.45)
1998	42.06 (1.37)	39.12 (1.26)	-2.94 (1.86)	3.26 (2.62)	49.92 (2.04)	53.98 (1.33)	4.06* (2.44)	6.13* (3.45)
N	1,303	1,508			599	1,395		

Notes: Standard errors in parentheses.

* denotes statistically significant at 10% level;

** denotes statistically significant at 5% level;

*** denotes statistically significant at 1% level.

The Empirical Model

The results in Tables 5 and 6 that illustrate the effects of EITC expansions and the effects of AFDC changes on employment rates do not adjust for demographic differences across counties or changes to the caseloads across time. Nor do they directly adjust for any differences in labor market conditions. The nature of the sampling procedures used to draw households into the CWPDP may also affect the generalizability of the estimates in these two tables to other welfare populations.

To control for the influence of these extraneous factors, we make use of regression methods. Let Emp_{ict} denote an indicator variable for whether an adult in the i^{th} household from county c is employed in (calendar) year t ,²⁸ where $Emp_{ict} = 1$ if an adult works and 0 otherwise. We are interested in how employment choices of welfare households (Emp_{ict}) are affected by changes in the provisions of the AFDC program and in the generosity of the EITC. Let T_{it}^{AFDC} and T_{it}^{EITC} be indicator variables denoting the AFDC and EITC “regimes” that the i^{th} household is subject to in year t . As noted above, a household’s employment choices also are likely to differ as a function of its demographic characteristics, X_{ict} ; the prevailing labor market conditions in the county of residence in year t , L_{ict} ; the household’s “attachment” to welfare—which we index by the vector, W_{ict} —that affects the likelihood of the household being selected into the CWPDP analysis sample; and other, unobserved factors, ε_{ict} . That is, household employment choices are assumed to be a function of the following variables:

(1)

$$Emp_{ict} = f(T_{it}^{AFDC}, T_{it}^{EITC}, X_{ict}, L_{ict}, W_{ict}, \varepsilon_{ict})$$

We want to isolate the effects of changes in the AFDC and the EITC regimes on the average employment rates of households that are or have been on the California AFDC caseload during the 1990s, the period over which we observe variation in these regimes. To proceed, we parameterize $f(\cdot)$ as the following linear function of its arguments:

(2)

$$Emp_{ict} = \sum_t \alpha_t T_{it}^{EITC} + \sum_t \beta_t T_{it}^{AFDC} + \gamma' X_{ict} + \delta' L_{ict} + \phi' W_{ict} + \varepsilon_{ict}$$

Since Emp is a dichotomous dependent variable, the specification in (2) constitutes a linear probability model of employment choices. We assume that ε_{ict} is independent across households but adjust standard errors on the regression coefficients for correlations within a household across time.

To identify the effects of AFDC changes, we exploit the fact that households enrolled in the CWPDP Project were randomly assigned to two different AFDC regimes, where the *experimentals* ($T_{it}^{AFDC} = 1$) were subject to the AFDC reforms instituted at the end of 1992 and the *controls* ($T_{it}^{AFDC} = 0$) continued to be subject to the provisions of the program in place prior to 1993.

²⁸ Note that for households headed by a single adult—typically a female head of household—this is an indicator of whether the person works in the particular year. In households headed by two adults, such as is the cases for households that qualify for the AFDC-U program, EICT denotes whether at least one (or both) adults work in a particular year.

To identify the effects of expansion of the EITC, we exploit the fact that households with two or more children could receive a higher credit than those with just one child as of 1994, while both types of households faced almost the same credit schedule prior to 1994. Thus, in terms of the specification in (2), T_{it}^{EITC} is defined to be equal to 1 if a household had two or more children and 0 if they had only one child and the differential effects are captured by the β_t 's for $t = 1994, \dots, 1998$.²⁹

The validity of this identification strategy rests on two assumptions: (a) that the fertility rates of low-income households do not change in response to this change in the EITC, and (b) that the composition of our analysis sample, i.e., those households coming onto welfare, does not systematically change so as to alter the relative labor force propensities of families with one child compared to families with two or more children. As we have argued above, assumption (a) seems reasonable, although we cannot completely rule out that this tax change results in a fertility increase among low-income households. We address assumption (b) by examining the robustness of results across different samples and, in some specifications, using information on welfare use prior to entry into our samples.

In appendix Table A4, we provide a list of the variables, and their definitions, that we use for the X , L , and W vectors in (2). Most of them are self-explanatory, but the welfare attachment variables require further explanation. First, dummy variables are constructed for each entry cohort onto welfare. These variables are meant to capture differences in entry cohorts across years caused by changes in economic conditions. For example, the typical family entering welfare may differ between recessions and expansions. Second, dummy variables are included that indicate the time that has transpired between the year in which labor force participation is measured and the beginning of the family's welfare spell at the time of selection into the CWPDP (for some specifications this value can be negative). These variables are intended to control for differences in labor force participation associated with the passage of time after initial AFDC receipt. In particular, we expect labor force participation to increase as the time from entry grows.

We estimate this model on the point-in-time and new entrants samples. Because the point-in-time sample is substantially larger, it yields more accurate estimates. However, as Bane and Ellwood (1986) note, the point-in-time caseload overrepresents households with longer welfare spells. As such, looking at their exit rate from welfare to work may not reflect the long-run effect of the EITC expansion. We address this concern with the new entrant samples. For 1992–1996, we observe a random sample of families starting new welfare spells, generating a sample that should more closely resemble the typical entrant into welfare.

Finally, if our identification strategies are valid, we should find that the employment rates of households with two or more children compared with those with only one child should be stable in years prior to the EITC expansion. Similarly, the employment rates of households assigned to experimental ($T^{AFDC} = 1$) status should not be different from those assigned to the control status ($T^{AFDC} = 0$) in years prior to random assignment. To test these implications of our identification strategies, we obtained employment data on the households in our sample for 1986–1993 from the same administrative data source (California's UI Base Wage records).

²⁹ We restrict our sample to households with at least one child at the time of selection into the CWPDP.

For these same years, we track the number of children in each case using the birth dates of children in an assistance unit. Then, we expand the regression specification in (2) to model employment rates over the period 1986–1998 and estimate separate coefficients on T^{AFDC} and T^{EITC} for years 1987–1993 (1986 is the omitted year). We test whether we can reject the hypotheses that the pre-1993 coefficients on these variables are equal to zero.

Empirical Results

Table 7 shows a specific, complete set of regression results. The sample used in the table is the four-county caseload from October 1992. The dependent variable indicates whether an adult in the household participated in the labor market (i.e., had positive EDD earnings) during the year.

All specifications have a similar structure. We condition on available household characteristics. The estimates in Table 7 are generally consistent across specifications and samples. As expected, given the fact that we examine whether either adult in two-adult households was employed during a year, the employment rates are higher in AFDC-U households than in AFDC-FG households. These employment rates decline with the average age of adults in the household, and are generally lower in Asian households relative to other ethnic groups. Finally, we find that employment rates also decline monotonically with the number of children in the household.

We also include location and year dummies in each specification. There are no significant county patterns. The year dummies have the qualitative pattern one would expect after seeing Figure 4: labor force participation rates rise relative to the excluded year of 1993.

The focus of our work is on three sets of variables that reflect the effects on labor force participation rates of (1) the California Work Pays Demonstration Project, (2) EITC expansions, and (3) local labor market conditions.

The California Work Pays Demonstration Project.

We examine the effects of the CWPDP using a series of “treatment by year” interaction terms. The experimental (or treatment) cases received the changes of the CWPDP along with the remainder of AFDC recipients in California, while the control cases received benefits under the old system. The employment rates of the treatment group were between 5.9 and 2.7 percentage points higher than for the control group. Each estimate is statistically significant at usual levels of confidence.³⁰ These are fairly large policy effects, given the employment rates never exceed 47 percent in the AFDC-FG sample and never exceed 58 percent in the AFDC-U sample.

The regression results also show the effect of a brief, “reverse experiment” that occurred as the CWPDP was concluded in December 1997 and the control group was subsequently covered by the same benefit package as the treatment group. As would be expected if the CWPDP experiment were influencing employment rates of adults in our samples, treatment-control differences fell by 41 percent between 1997 and 1998, the first year that the AFDC/TANF package available to the two groups was the same.

³⁰ Our results differ from Becerra et al. (1998) who, in the final report on the California Work Pays Demonstration Project, find small, often insignificant, positive labor market effects for AFDC-FG cases and somewhat larger, significant positive effects for AFDC-UP cases. In specifications not shown (but available on request), we find similar results to those reported for both U and FG cases.

Table 7:
Regression Estimates for Adult Employment Rates for
Years Since Enrollment into CWPDP through 1998¹
Point-in-Time Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Intercept	-1.877	0.362	5.19
EXP ₉₃	0.059	0.009	6.83
EXP ₉₄	0.032	0.012	2.79
EXP ₉₅	0.030	0.012	2.59
EXP ₉₆	0.051	0.012	4.19
EXP ₉₇	0.046	0.012	3.78
EXP ₉₈	0.027	0.013	2.14
2+Kids ₉₄	0.006	0.012	0.50
2+Kids ₉₅	0.016	0.013	1.27
2+Kids ₉₆	0.026	0.013	1.94
2+Kids ₉₇	0.063	0.014	4.53
2+Kids ₉₈	0.064	0.014	4.47
AFDC-U	0.148	0.010	14.27
Adults	0.042	0.026	1.65
MeanAge,Adults	-0.004	0.000	8.58
Female	0.055	0.026	2.14
White	-0.044	0.036	1.21
Hispanic	-0.007	0.037	0.18
Black	0.044	0.036	1.20
Asian	-0.071	0.037	1.93
Kid2	-0.052	0.011	4.93
Kid3	-0.059	0.012	4.98
Kid4	-0.102	0.012	8.50
Alameda	-0.088	0.066	1.32
San Bernardino	-0.012	0.084	0.14
San Joaquin	0.127	0.090	1.41
Yr94	0.075	0.014	5.55
Yr95	0.113	0.018	6.40
Yr96	0.129	0.022	5.97
Yr97	0.134	0.028	4.70

Table 7: Continued
Regression Estimates for Adult Employment Rates for
Years Since Enrollment into CWPDP through 1998¹
Point-in-Time Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Yr98	0.100	0.036	2.76
GAIN Prop.	0.098	0.020	4.78
Employmt. Rate	0.626	0.315	1.99
Empl. Share, Manu	0.057	0.600	0.09
Empl. Share, Service	0.846	0.741	1.14
Empl. Share, Retail	5.367	1.129	4.75
Inc/Worker	0.021	0.017	1.25
Inc/Worker, Manu	0.006	0.006	1.02
Inc/Worker, Service	-0.013	0.009	1.35
Inc/Worker, Retail	0.022	0.017	1.34
New Entrant in Yr87	0.003	0.019	0.13
New Entrant in Yr88	0.023	0.019	1.22
New Entrant in Yr89	0.021	0.023	0.91
New Entrant in Yr90	0.016	0.028	0.60
New Entrant in Yr91	0.070	0.033	2.12
New Entrant in Yr9	0.072	0.039	1.86
Dur(+2)	0.005	0.008	0.64
Dur(+3)	0.016	0.013	1.24
Dur(+4)	0.026	0.020	1.31
Dur(+5)	0.035	0.026	1.35
Dur(+6)	0.052	0.032	1.61
Dur(+7)	0.068	0.039	1.75
Dur(+8)	0.083	0.045	1.83
Dur(+9)	0.083	0.052	1.60
Dur(+10)	0.100	0.059	1.70
Dur(+11)	0.103	0.066	1.56
Dur(+12)	0.131	0.073	1.80

¹ Sample includes all households in CWPDP, *except* experimentals from San Joaquin County, those households that did not include an adult, and households that contain three or more adults. Employment outcomes are analyzed in years *after* enrollment into CWPDP.

As noted earlier, the CWPDP incorporated a bundle of changes to the welfare package. Given the structure of the experiment, we cannot disentangle the effects of specific changes. To give a sense of the magnitudes involved, in 1993 the average AFDC benefit was \$4,610 for AFDC-FG cases and \$5,843 for AFDC-U cases in our sample, in 1984 dollars (the unit for all dollar amounts in the paper). A 15 percent reduction in benefits, therefore, would result in an average annual benefit reduction of roughly \$692 for AFDC-FG households and \$876 for AFDC-U households, again, in 1984 dollars (from Hill et al., 1999). The CWPDP also extended beyond four months the so-called “30 and 1/3 provision,” which allowed recipients to keep one-third of earned income (and also the first \$30), rather than having their AFDC benefits fall by \$1 for every \$1 of income earned. With this extension, forward-looking potential workers in the treatment group might realize that the return to work would increase after four months, relative to the status quo. Although recognizing the change in the 30 and 1/3 provisions and other elements of the CWPDP package, we view the 15 percent benefit reduction as being the most significant element affecting AFDC-FG households. The primacy of the benefit reduction is less clear for AFDC-U cases because the CWPDP also removed the rule that limited benefits to those in AFDC-U cases who work fewer than 100 hours.

EITC expansions.

We examine EITC changes by interacting dummy variables indicating the household has two or more children with year dummies. Relative to one-child families, labor force participation rates of families with two or more children differ, as indicated by the negative and significant child dummies. The patterns of the year-child interactions, however, are striking. The interaction terms show that employment rates for those with two or more children increase steadily relative to families with one child, just as the EITC increases for these families. Specifically, employment rates increase by 1.6 percentage points in 1995, 2.6 percentage points in 1996, and 6.3 percentage points in 1997, relative to employment rates for one-child families. The 1996 estimate is statistically significant at the 6 percent level, and the later estimates are significant at the 1 percent level. These increases mirror the increase in the EITC differential available to families with two or more children, which equal \$344 in 1994, \$693 in 1995, and \$930 in 1996, again in 1984 dollars.

These results are very similar to the results generated by an alternative specification (not shown, but available from the authors on request) in which we replace the two-plus child by year interactions with a variable giving the maximum EITC benefit available to the family given their number of children. The coefficient on the EITC variable indicates that a \$1,000 increase in the EITC would increase labor force participation by 5.1 percentage points (with a t-statistic of 3.8). The patterns of the regressions coefficients are what one would expect if the EITC increases labor force participation of California families receiving welfare.

Labor market characteristics.

We include a set of local labor market characteristics, which, along with the year dummies, attempt to capture the effect of local labor market conditions and the business cycle on employment rates. Across specifications, these coefficients move around a great deal; therefore, there is no definitive story that emerges from these local labor market conditions.

Sensitivity Analysis

The results described above are generally consistent across different specifications. We discuss a set of alternative specifications. In the appendix, we present a full set of results similar to those in Table 7 but that are estimated on a pooled sample of new AFDC entrants (see appendix tables). We then present two similar specifications that use extensive prior information on welfare and employment patterns of sample members. These specifications address the concern that potentially unusual compositional issues could account for our results. We show that prior to the EITC expansions and CWPDP, labor force participation rates differ in levels between families with one child or two or more children, but that these differences do not change until the EITC begins to diverge for these two types of families. We also show there are no prior treatment-control differences.

New entrants sample.

Appendix Table A1 presents a complete set of results for a sample of new entrants to AFDC from 1992–1996. Patterns of coefficients on other covariates are similar to the specification in Table 7, although they are somewhat stronger.

CWPDP treatment-control differences are smaller and somewhat less precisely estimated in the new entrants sample than in the point-in-time sample. Significant differences of approximately 3.2–4.0 percentage points arise in 1993 to 1996, but they disappear by the last two years of the sample. Recall the experiment ended in December 1997. Also, no new entrants were added to our sample after 1996.

The EITC estimates are larger, reaching 7.8 percentage points rather than 6.3 percentage points. The employment rates for families with two or more children increase steadily relative to families with one child, just as the EITC increases for these families. The estimates are significant at usual levels of confidence and economically large, exceeding 6.5 percentage points by 1995 and later. The EITC coefficient when the two-plus child by year interactions are replaced by the maximum EITC benefit are 8.1 percentage points for every \$1,000 increase in the EITC. Again, these are larger than the EITC estimates from the point-in-time sample. The coefficients on labor market conditions move around a great deal compared with the point-in-time sample.

Use of prior year information.

The spirit of the specifications in Table 7 and appendix Table A1 is that, after conditioning on other characteristics, employment rates for families with one child are similar to employment rates for families with two or more children, outside of the differing expansions of the EITC. Analogously, prior to the CWPDP, the employment rates of treatment households are similar to those of the controls.

We have earnings data for workers in the sample dating back to 1986. Consequently, in appendix Tables A2 and A3, we extend the previous specifications to also examine labor force participation prior to the EITC expansion and CWPDP. Households that are too young to receive welfare in an earlier year are dropped from the sample; therefore, for example, an 18-year-old in the 1993 point-in-time sample would not be an observation when estimating the probability of being employed in 1987.

A complication arises with this specification; a family with two or more children in the point-in-time or new entrants sample does not necessarily have two children in the earlier years. To address this issue, we examine individual-level information that accompanies the case data to determine the birth dates of the children. If a child had not yet been born in the earlier year, we reclassify the household as appropriate (as having one or two or more children). Although the case-level information is used directly in benefits administration, the individual-level information is not. Perhaps as a consequence, there are a substantial number of inconsistencies between the individual-level and case-level data. The samples used in appendix Tables A2 and A3 and in sections of Tables 8 and 9 drop observations with inconsistencies between the individual and case records. Roughly 60 percent of cases are included after dropping observations for which individual records fail to match case records. As mentioned above, we also include a series of duration dummies in these specifications that try to account for level differences and intertemporal differences in employment rates across cohorts that entered welfare at different times.

Results for EITC effects across the two samples are given in Table 8. Beyond time-invariant differences in levels, there are no significant differences in employment rates between families with two or more children relative to one-child families prior to 1994. This suggests that there are no obvious differences in the incidence of employment between families with one child and families with two or more children prior to 1993.

The EITC's effects on employment are much stronger than the estimates reported in Table 7 once we account for prior employment and time on welfare. The key interaction terms in Table 9 range from 5.1 to 8.5 percentage points between 1994 and 1997, and again mirror the phased in increase in the EITC for families with two or more children. The magnitudes of the EITC estimates in the new entrants sample are somewhat smaller and less precisely estimated when we condition on the length of time since the case entered welfare (from the most recent spell), but again, the sample size of the new entrants sample used in appendix Table A3 is roughly only half the size of the sample used as the basis for appendix Table A1.

We examined one last consideration in our sensitivity analysis. We were concerned that perhaps the labor force participation behavior of families with three or more children might differ substantially from the behavior of families with two children, and therefore, the EITC differences reported earlier arose from spurious differences driven by families with three or more children. Dropping families with three or more children from the sample, in specifications very similar to those reported in Table 7 and appendix Table A1, produces comparable to slightly larger estimates of the effects of the EITC on labor force participation.

The Relative Magnitudes of the CWPDP, EITC, and Labor Markets

In this section, we present a very preliminary, suggestive calculation of the relative importance of the effects of the CWPDP, EITC expansions, and local labor markets on employment rates of adults in families from the California caseload. We emphasize that this is currently offered in the spirit of a “back of the envelope” calculation to help readers assess the relative magnitudes of the empirical results. The calculations will be refined in subsequent drafts.

Table 8:
Effects of CWPDP Treatment on Work Rates
(Regression Adjusted)

Year	Full Analysis Sample ¹		Analysis Subsample of Households with Valid Birth Dates ²	
	Point-in-Time Sample	New Entrant Sample	Point-in-Time Sample	New Entrant Sample
1987			-0.001	-0.007
1988			0.013	-0.005
1989			-0.013	-0.010
1990			-0.021	0.039
1991			-0.028*	0.012
1992			-0.038**	-0.013
1993	0.059***	0.040*	-0.002	0.020
1994	0.032***	0.040**	0.028	0.046*
1995	0.030***	0.035**	0.026	0.042*
1996	0.051***	0.032*	0.050***	0.035
1997	0.046***	0.007	0.042**	0.004
1998	0.027**	0.007	0.032	0.018

¹ Sample includes all households in CWPDP, *except* experimentals from San Joaquin County, those households that did not include an adult, and households that contain three or more adults. Employment outcomes are analyzed in years *after* enrollment into CWPDP.

² Sample consists of subset of households from Full Analysis Sample for which valid birth dates are available for all children in household at time of being on welfare. Employment outcomes are analyzed for *all* years from 1987 through 1998.

We focus first on the results for the point-in-time sample. As shown in Table 6, between 1993 and 1998, employment rates increased by 13 percentage points for AFDC-FG families with one child and 19 percentage points for families with two or more children. The comparable increases for AFDC-U cases are 18 percentage points for one-child families and 27 percentage points for families with two or more children.

The estimates using the maximum EITC variable suggest that a \$1,000 increase in the maximum EITC increases employment from 5.1–8.1 percentage points. We will use the midpoint of 6.6 percentage points. The maximum EITC increased \$417 over this period for one-child families and by \$1,308 for families with two or more children when measured in 1984 dollars. These EITC increases could account for roughly 21 percent ($417 \div .0066 \div 100/13$) of the labor force participation increase for one-child, AFDC-FG families, and 45 percent ($1308 \div .0066 \div 100/19$) of the increase for AFDC-FG families with two or more children. The corresponding numbers for AFDC-U cases are 15 percent and 32 percent.

Table 9:
Effects of 1994 EITC Expansion on Work Rates
(Regression Adjusted)

Year	Full Analysis Sample ¹		Analysis Subsample of Households with Valid Birth Dates ²	
	Point-in-Time Sample	New Entrant Sample	Point-in-Time Sample	New Entrant Sample
1987			0.005	-0.021
1988			0.025	0.013
1989			0.001	0.002
1990			-0.001	-0.011
1991			0.031	-0.018
1992			0.031	-0.008
1993			0.031	-0.005
1994	0.006	0.026	0.054**	0.020
1995	0.016	0.066***	0.051**	0.029
1996	0.026*	0.078***	0.067***	0.043
1997	0.063***	0.073***	0.085***	0.070**
1998	0.064***	0.070***	0.080***	0.047

¹ Sample includes all households in CWPDP, except experimentals from San Joaquin County, those households that did not include an adult, and households that contain three or more adults. Employment outcomes are analyzed in years after enrollment into CWPDP.

² Sample consists of subset of households from Full Analysis Sample for which valid birth dates are available for all children in household at time of being on welfare. Employment outcomes are analyzed for all years from 1987 through 1998.

The CWPDP increased labor force participation rates by as much as 5 percentage points. Roughly 60 percent of the sample is composed of experimental cases, suggesting that the CWPDP accounted for roughly 3 percentage points of the increase in employment rates in our sample. This is 23 percent of the increase for one-child AFDC-FG families and 16 percent of the increase for AFDC-FG families with two or more children. The corresponding numbers for AFDC-U cases are 17 percent and 11 percent.

These illustrative calculations suggest that the EITC and CWPDP changes can account for roughly 44 percent of the changes in employment for AFDC-FG households with one child, and 61 percent for households with two or more children. They can account for 32 (43) percent of the changes in labor force participation for AFDC-U households with one child (two or more children). This suggests changes in the economy account for, at most (given that it is the residual) 39–56 percent of the changes in employment for AFDC-FG households, and 57–68 percent of the changes in employment for AFDC-U households. It is little surprise that

AFDC-U household have greater sensitivity to economic conditions, both because they have two potential workers in the family and because at least one member must have recent labor market experience.

Conclusion

The policy merits of the EITC depend on the answers to two critical questions. Is it administrable, and is it effective? We opened this paper by discussing EITC administrative issues. A recent compliance study by the Internal Revenue Service found that 25.8 percent of EITC claims were erroneous, accounting for \$7.8 billion of inappropriately paid dollars. At the same time, the EITC costs many billion dollars fewer to administer than income transfer programs, but transfer programs have lower error rates. There is clearly a tradeoff between administrative efficiency and lack of intrusiveness, which are favorable characteristics of the EITC, and high error rates, which is an unfavorable characteristic. Recent Treasury Department initiatives would alter the AGI tiebreaker test and make use of the Federal Case Registry of Child Support Orders to identify EITC claims made on behalf of noncustodial parties. These proposals target the largest sources of EITC noncompliance and, in our view, are very promising.

The EITC already transfers a large amount of money to working poor families and reduces poverty. There is also a considerable amount of evidence that the credit not only redistributes resources, but also encourages employment, thereby avoiding one of the negative behavioral incentives of traditional income transfer programs. Our paper develops new evidence that adds to these results. Ours is the first EITC paper to use data from other than the CPS or SIPP. We also are the first EITC paper to use experimental variation to account for the effect of altering the benefit package available to welfare recipients. Finally, ours is the first to focus on a population of welfare recipients, which allows us to explicitly examine the effects of the EITC in helping people move from welfare to work.

Across several specifications we find striking, positive effects of the EITC on employment. We adopted a subtle identification strategy, one that has not previously been the primary focus of other papers. In particular, we base our analysis on identifying changes in employment rates for welfare households with two or more children relative to households with one child. Both cross-tabulations and regression analyses that condition on a large number of characteristics show changes in employment that mirror statutory changes in the EITC. We view the evidence as being strongly supportive of the proposition that the EITC has played an important role in increasing the employment rates among low-skilled workers, particularly those who received or are receiving AFDC/TANF.

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Appendix Table 1:
Regression Estimates for Adult Employment Rates for
Years Since Enrollment into CWPDP through 1998¹
New Entrants Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Intercept	-0.872	0.853	1.02
EXP ₉₃	0.040	0.021	1.88
EXP ₉₄	0.040	0.018	2.19
EXP ₉₅	0.035	0.017	2.04
EXP ₉₆	0.032	0.016	1.95
EXP ₉₇	0.007	0.016	0.45
EXP ₉₈	0.007	0.015	0.49
2+Kids ₉₄	0.026	0.020	1.30
2+Kids ₉₅	0.066	0.022	2.94
2+Kids ₉₆	0.078	0.023	3.42
2+Kids ₉₇	0.073	0.023	3.16
2+Kids ₉₈	0.070	0.024	2.98
AFDC-U	0.158	0.014	11.35
Adults	0.014	0.031	0.46
Mean Age, Adults	-0.003	0.001	4.17
Female	0.044	0.032	1.37
White	-0.116	0.041	2.80
Hispanic	-0.075	0.041	1.82
Black	-0.065	0.043	1.53
Asian	-0.223	0.044	5.05
Kid2	-0.052	0.022	2.36
Kid3	-0.074	0.024	3.09
Kid4	-0.112	0.025	4.40
Alameda	0.313	0.215	1.45
San Bernardino	0.374	0.437	0.86
San Joaquin	0.646	0.366	1.77
Yr94	0.129	0.025	5.06
Yr95	0.207	0.050	4.17
Yr96	0.277	0.069	4.00
Yr97	0.395	0.076	5.19

Appendix Table 1: Continued
Regression Estimates for Adult Employment Rates for
Years Since Enrollment into CWPDP through 1998¹
New Entrants Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Yr98	0.406	0.092	4.43
GAIN Prop.	-0.031	0.060	0.51
Employmt. Rate	-1.195	1.679	0.71
Empl. Share, Manu	-1.336	1.675	0.80
Empl. Share, Service	4.832	2.269	2.13
Empl. Share, Retail	-1.146	4.358	0.26
Inc/Worker	0.071	0.044	1.60
Inc/Worker, Manu	-0.007	0.014	0.51
Inc/Worker, Service	-0.014	0.027	0.52
Inc/Worker, Retail	-0.040	0.053	0.75
New Entrant in Yr94	-0.041	0.032	1.31
New Entrant in Yr95	-0.168	0.046	3.68
New Entrant in Yr96	-0.542	0.059	9.26
Dur(+2)	-0.100	0.016	6.17
Dur(+3)	-0.151	0.031	4.84
Dur(+4)	-0.219	0.046	4.73
Dur(+5)	-0.273	0.061	4.45
Dur(+6)	-0.297	0.075	3.94

¹ Sample includes all households in CWPDP, *except* experimentals from San Joaquin County, those households that did not include an adult, and households that contain three or more adults. Employment outcomes are analyzed in years *after* enrollment into CWPDP.

**Appendix Table 2:
Regression Estimates for Adult Employment Rates for
1987 through 1998¹
Point-in-Time Sample**

Variable	Coefficient Estimate	Standard Error	t-Value
Intercept	-0.347	0.488	0.71
EXP87	-0.001	0.016	0.04
EXP88	0.013	0.016	0.81
EXP89	-0.013	0.017	0.76
EXP90	-0.021	0.017	1.26
EXP91	-0.028	0.015	1.84
EXP92	-0.038	0.015	2.45
EXP93	-0.002	0.016	0.14
EXP94	0.028	0.018	1.62
EXP95	0.026	0.018	1.45
EXP96	0.050	0.018	2.72
EXP97	0.042	0.019	2.24
EXP98	0.032	0.020	1.62
2+Kids87	0.005	0.016	0.30
2+Kids88	0.025	0.019	1.36
2+Kids89	0.001	0.020	0.04
2+Kids90	-0.001	0.021	0.06
2+Kids91	0.031	0.022	1.40
2+Kids92	0.031	0.023	1.36
2+Kids93	0.031	0.024	1.28
2+Kids94	0.054	0.024	2.25
2+Kids95	0.051	0.024	2.09
2+Kids96	0.067	0.025	2.74
2+Kids97	0.085	0.025	3.43
2+Kids98	0.080	0.025	3.28
AFDC-U	0.144	0.013	11.00
Adults	-0.008	0.031	0.25
Mean Age, Adults	-0.005	0.001	6.35
Female	0.022	0.031	0.71
White	-0.076	0.054	1.40

Appendix Table 2: Continued
Regression Estimates for Adult Employment Rates for
1987 through 1998¹
Point-in-Time Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Hispanic	0.001	0.055	0.01
Black	0.020	0.055	0.36
Asian	-0.110	0.055	1.99
Kid2	-0.072	0.016	4.48
Kid3	-0.084	0.018	4.67
Kid4	-0.135	0.020	6.78
Alameda	-0.024	0.088	0.27
San Bernardino	0.069	0.087	0.79
San Joaquin	0.122	0.109	1.12
Yr87	0.017	0.033	0.52
Yr88	0.021	0.053	0.39
Yr89	0.072	0.072	1.00
Yr90	0.090	0.096	0.93
Yr91	0.048	0.119	0.40
Yr92	0.002	0.141	0.01
Yr93	0.041	0.163	0.25
Yr94	0.064	0.183	0.35
Yr95	0.127	0.206	0.62
Yr96	0.130	0.228	0.57
Yr97	0.129	0.247	0.52
Yr98	0.084	0.267	0.32
GAIN Prop	0.003	0.022	0.14
Employmt. Rate	-0.600	0.477	1.26
Empl. Share, Manu	-1.380	0.725	1.90
Empl. Share, Service	-0.412	1.058	0.39
Empl. Share, Retail	0.233	1.262	0.18
Inc/Worker	0.107	0.023	4.74
Inc/Worker, Manu	-0.017	0.007	2.31
Inc/Worker, Service	-0.035	0.012	2.78
Inc/Worker, Retail	0.015	0.020	0.77

Appendix Table 2: Continued
Regression Estimates for Adult Employment Rates for
1987 through 1998¹
Point-in-Time Sample

Variable	Coefficient Estimate	Standard Error	t-Value
New Entrant in Yr88	0.068	0.043	1.58
New Entrant in Yr89	0.075	0.062	1.21
New Entrant in Yr90	0.041	0.082	0.50
New Entrant in Yr91	0.135	0.104	1.30
New Entrant in Yr92	0.162	0.125	1.30
Dur(-6)	-0.050	0.131	0.38
Dur(-5)	-0.021	0.109	0.19
Dur(-4)	-0.015	0.087	0.17
Dur(-3)	-0.001	0.066	0.02
Dur(-2)	0.025	0.044	0.57
Dur(-1)	0.047	0.023	2.08
Dur(+1)	-0.076	0.023	3.31
Dur(+2)	-0.058	0.044	1.30
Dur(+3)	-0.027	0.066	0.42
Dur(+4)	-0.014	0.087	0.16
Dur(+5)	0.018	0.108	0.17
Dur(+6)	0.053	0.130	0.41
Dur(+7)	0.076	0.152	0.50
Dur(+8)	0.097	0.173	0.56
Dur(+9)	0.112	0.195	0.58
Dur(+10)	0.144	0.216	0.67
Dur(+11)	0.180	0.238	0.76
Dur(+12)	0.216	0.258	0.84

¹ Sample consists of subset of households from Full Analysis Sample for which valid birth dates are available for all children in household at time of being on welfare. Employment outcomes are analyzed for all years from 1987 through 1998.

Appendix Table 3:
Regression Estimates for Adult Employment Rates for 1987 through 1998¹
New Entrant Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Intercept	-2.057	0.684	3.01
EXP ₈₇	-0.007	0.025	0.27
EXP ₈₈	-0.005	0.024	0.21
EXP ₈₉	-0.010	0.025	0.42
EXP ₉₀	0.039	0.025	1.55
EXP ₉₁	0.012	0.024	0.49
EXP ₉₂	-0.013	0.024	0.53
EXP ₉₃	0.020	0.025	0.82
EXP ₉₄	0.046	0.025	1.80
EXP ₉₅	0.042	0.025	1.66
EXP ₉₆	0.035	0.026	1.35
EXP ₉₇	0.004	0.027	0.14
EXP ₉₈	0.018	0.027	0.65
2+Kids ₈₇	-0.021	0.022	0.95
2+Kids ₈₈	0.013	0.027	0.49
2+Kids ₈₉	0.002	0.029	0.08
2+Kids ₉₀	-0.011	0.030	0.38
2+Kids ₉₁	-0.018	0.031	0.58
2+Kids ₉₂	-0.008	0.033	0.25
2+Kids ₉₃	-0.005	0.035	0.15
2+Kids ₉₄	0.020	0.034	0.59
2+Kids ₉₅	0.029	0.035	0.84
2+Kids ₉₆	0.043	0.035	1.22
2+Kids ₉₇	0.070	0.035	1.97
2+Kids ₉₈	0.047	0.035	1.34
AFDC-U	0.155	0.018	8.43
Adults	-0.004	0.037	0.10
Mean Age, Adults	-0.002	0.001	1.90
Female	0.037	0.039	0.94
White	-0.080	0.063	1.27
Hispanic	0.016	0.063	0.26

Appendix Table 3: Continued
Regression Estimates for Adult Employment Rates for 1987 through 1998¹
New Entrant Sample

Variable	Coefficient Estimate	Standard Error	t-Value
Black	-0.029	0.065	0.45
Asian	-0.258	0.066	3.88
Kid2	-0.013	0.024	0.54
Kid3	-0.042	0.028	1.54
Kid4	-0.093	0.032	2.87
Alameda	0.100	0.128	0.78
San Bernardino	0.260	0.134	1.94
San Joaquin	0.454	0.159	2.85
Yr87	0.193	0.041	4.65
Yr88	0.288	0.058	4.98
Yr89	0.388	0.074	5.21
Yr90	0.469	0.098	4.77
Yr91	0.571	0.122	4.67
Yr92	0.609	0.145	4.19
Yr93	0.703	0.167	4.20
Yr94	0.815	0.183	4.44
Yr95	0.931	0.204	4.57
Yr96	1.018	0.224	4.54
Yr97	1.062	0.238	4.46
Yr98	1.035	0.252	4.11
GAIN Prop.	-0.001	0.031	0.03
Employmt. Rate	-0.592	0.657	0.90
Empl. Share, Manu	-0.913	1.041	0.88
Empl. Share, Service	2.174	1.529	1.42
Empl. Share, Retail	1.272	1.838	0.69
Inc/Worker	0.007	0.032	0.23
Inc/Worker, Manu	-0.001	0.010	0.11
Inc/Worker, Service	0.011	0.018	0.60
Inc/Worker, Retail	0.070	0.030	2.36
New Entrant in Yr94	-0.011	0.040	0.27
New Entrant in Yr95	-0.194	0.058	3.33

Appendix Table 3: Continued
Regression Estimates for Adult Employment Rates for 1987 through 1998¹
New Entrant Sample

Variable	Coefficient Estimate	Standard Error	t-Value
New Entrant in Yr96	-0.339	0.075	4.52
Dur(-9)	0.791	0.178	4.45
Dur(-8)	0.727	0.157	4.63
Dur(-7)	0.668	0.137	4.89
Dur(-6)	0.610	0.118	5.16
Dur(-5)	0.518	0.099	5.25
Dur(-4)	0.435	0.079	5.48
Dur(-3)	0.354	0.060	5.89
Dur(-2)	0.266	0.041	6.47
Dur(-1)	0.138	0.023	6.11
Dur(+1)	-0.130	0.023	5.62
Dur(+2)	-0.231	0.042	5.52
Dur(+3)	-0.264	0.061	4.31
Dur(+4)	-0.324	0.081	4.00
Dur(+5)	-0.357	0.101	3.55
Dur(+6)	-0.349	0.119	2.94

¹ Sample consists of subset of households from Full Analysis Sample for which valid birth dates are available for all children in household at time of being on welfare. Employment outcomes are analyzed for *all* years from 1987 through 1998.

Appendix Table 4:
Definition of Variables Used in Regression Analysis

Variable	Definition
Dependent Variable:	
Emp	= 1 if one or more adult in household worked in year t ; = 0 otherwise
Treatment Variables:	
$EXP_t (T_t^{AFDC})$	= 1 if household randomly assigned to experimental treatment in years on and after enrollment into CWPD; = 0 if randomly assigned to control group.
$2+Kids_t (T_t^{ETC})$	= 1 if household has 2 or more kids in year t ; = 0 otherwise
Demographic Characteristics (X_{ic}):	
AFDC-U	= 1 if case was AFDC-U case when enrollment into CWPD; 0 otherwise
Adults	Number of adults in household
Mean Age, Adults	Average age of adults in household ???
Female	= 1 if head of household is a female; = 0 otherwise
Male	= 1 if head of household is a male; = 0 otherwise (omitted category in regressions)
White	= 1 if household is white; = 0 otherwise
Hispanic	= 1 if household is Hispanic; = 0 otherwise
Black	= 1 if household is black; = 0 otherwise
Asian	= 1 if household is Asian; = 0 otherwise
Other Ethnic	= 1 if household is some other ethnic group; = 0 otherwise (omitted category in regressions)
Kid1	= 1 if 1 child in household at time of enrollment into CWPD; = 0 otherwise (omitted category in regressions)
Kid2	= 1 if 2 children in household at time of enrollment into CWPD; = 0 otherwise
Kid3	= 1 if 3 children in household at time of enrollment into CWPD; = 0 otherwise
Kid4	= 1 if 4 or more children in household at time of enrollment into CWPD; = 0 otherwise
Local Economic and Labor Market Conditions (L_{ic}):	
Alameda	= 1 if household resided in Alameda County at time of enrollment into CWPD; = 0 otherwise
Los Angeles	= 1 if household resided in Los Angeles County at time of enrollment into CWPD; = 0 otherwise (omitted category in regressions)
San Bernardino	= 1 if household resided in San Bernardino County at time of enrollment into CWPD; = 0 otherwise
San Joaquin	= 1 if household resided in San Joaquin County at time of enrollment into CWPD; = 0 otherwise
YrZ	= 1 if year t is equal to Z , $Z = 87, \dots, 98$; = 0 otherwise.
GAIN Prop.	Proportion of AFDC caseload in county of residence receiving GAIN services in year t
Empl Rate	Employment rate (total employment/total population) in county of residence in year t
Empl. Share, Manu	Share of employment in Manufacturing sector in county of residence in year t
Empl. Share, Service	Share of employment in Service sector in county of residence in year t
Empl. Share, Retail	Share of employment in Retail Trade sector in county of residence in year t
Inc/Worker	Income per Worker (in 1000 of 1987\$) in county of residence in year t
Inc/Worker, Manu	Income per Worker (in 1000 of 1987\$) in Manufacturing sector in county of residence in year t
Inc/Worker, Service	Income per Worker (in 1000 of 1987\$) in Service sector in county of residence in year t
Inc/Worker, Retail	Income per Worker (in 1000 of 1987\$) in Retail Trade sector in county of residence in year t
Timing of Welfare Entry and Duration Variables (W_{ic}):	
New Entrant in YrZ	= 1 if most recent spell on AFDC at or prior to household enrolled in CWPD started in YrZ, where $Z = 93, \dots, 97$; = 0 otherwise.
Dur(+Z)	= 1 if household's most recent spell on AFDC at or prior to enrollment in CWPD started Z years after year t ; = 0 otherwise.
Dur(-Z)	= 1 if household's most recent spell on AFDC at or prior to enrollment in CWPD started Z years prior to year t ; = 0 otherwise.