

Stepping Stone or Dead End? The Effect of the EITC on Earnings Growth

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Abstract

While many studies have found that the EITC increases the employment rates of single mothers, no study to date has examined whether the jobs taken by single mothers as a result of the EITC incentives are “dead-end” jobs or jobs that have the potential for earnings growth. Using a panel of administrative earnings data linked to nationally representative survey data, we find no evidence that the EITC expansions between 1994 and 1996 induced single mothers to take “dead-end” jobs. If anything, the increase in earnings growth during the mid-to-late 1990s for single mothers who were particularly affected by the EITC expansion was higher than it was for other similar women. The EITC encourages work among single mothers, and that work continues to pay off through future increases in earnings.

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1. INTRODUCTION

Numerous studies have found that expansions in the Earned Income Tax Credit (EITC) led to increases in employment for single mothers (Eissa and Liebman, 1996; Meyer and Rosenbaum, 2000, 2001). Less is known about the possible effect of the EITC on longer-term earnings growth for those women—that is, do single mothers who are pulled into employment by the EITC improve their labor market outcomes through increased earnings over time or do they remain stuck in low-earning jobs? On the one hand, we might expect increases in earnings over time. Evidence suggests that even among less-skilled groups, the returns to labor market experience are large (Gladden and Taber, 2000, 2006). On the other hand, we might not expect increases in earnings over time if the employment opportunities available to such single mothers are limited to ‘dead-end’ jobs that have with little potential for future earnings growth.

This study examines the effect of the EITC expansions in the early 1990s on the earnings growth of single mothers. We focus on single mothers both because they are a group likely to receive the EITC and because previous research found employment increases for this group following EITC expansions (e.g., Eissa and Leibman, 1996; Meyer and Rosenbaum, 2000, 2001).¹ We measure the annual earnings of single mothers using administrative earnings records from the Social Security Administration (SSA) linked to several panels of the Survey of Income and Program Participation (SIPP).² We exploit the longitudinal nature of the administrative records and employ a difference-in-difference strategy to identify the effects of the EITC on earnings growth and employment. In doing so, we are following the strategy

¹In 2003, 77 percent of EITC recipients were head of household or single filers, a group likely to be composed primarily of single mothers. That group received 75 percent of EITC dollars that year (U.S. House of Representatives, 2004).

²The Social Security administrative earnings include wage and salary earnings, tips, self-employment earnings, and some other forms sources of compensation. Unlike some Social Security earnings data, the data used in this analysis are not subject to topcoding; that is, there is no information lost on the very highest earners.

Hotz, Mullin, and Scholz (2005) used to identify employment effects of the EITC on welfare recipients in California, though we extend the analysis of employment effects to a nationally representative sample of single mothers and include an analysis of earnings growth effects.

We examine the one-, three-, and five-year growth rates in earnings for single mothers with two or more children—who were particularly affected by the 1993–1996 EITC expansion—relative to those for single mothers with exactly one child—who were less affected by the expansion—in both years prior to and following the EITC expansions. As with previous studies, disentangling the effects of the EITC from those of welfare reform and a changing work environment remains a challenge.

We find that single mothers with two or more children increased their employment rates relative to single mothers with one child by 1997. Their one-, three-, and five-year growth rates in earnings also increased relative to single mothers with one child. We find no evidence that the EITC led single mothers to take “dead-end” jobs.

2. BACKGROUND

In this section, we provide some background information on the EITC. We focus on how the expansions in the early 1990s affected single mothers with two or more children to a much greater extent than single mothers with one child, as our identification strategy hinges on that difference. We then briefly review the literatures on the effects of the EITC on employment, marriage, and fertility, and on the likelihood that government programs lead people to take “dead-end” jobs.

A. EITC Background

The EITC is a refundable tax credit that provides cash to lower income working parents and individuals through the federal income tax system.³ The credit was established in 1975 and was greatly

³In 1993, the credit was extended to workers without children. The maximum credit available to this group is small, however.

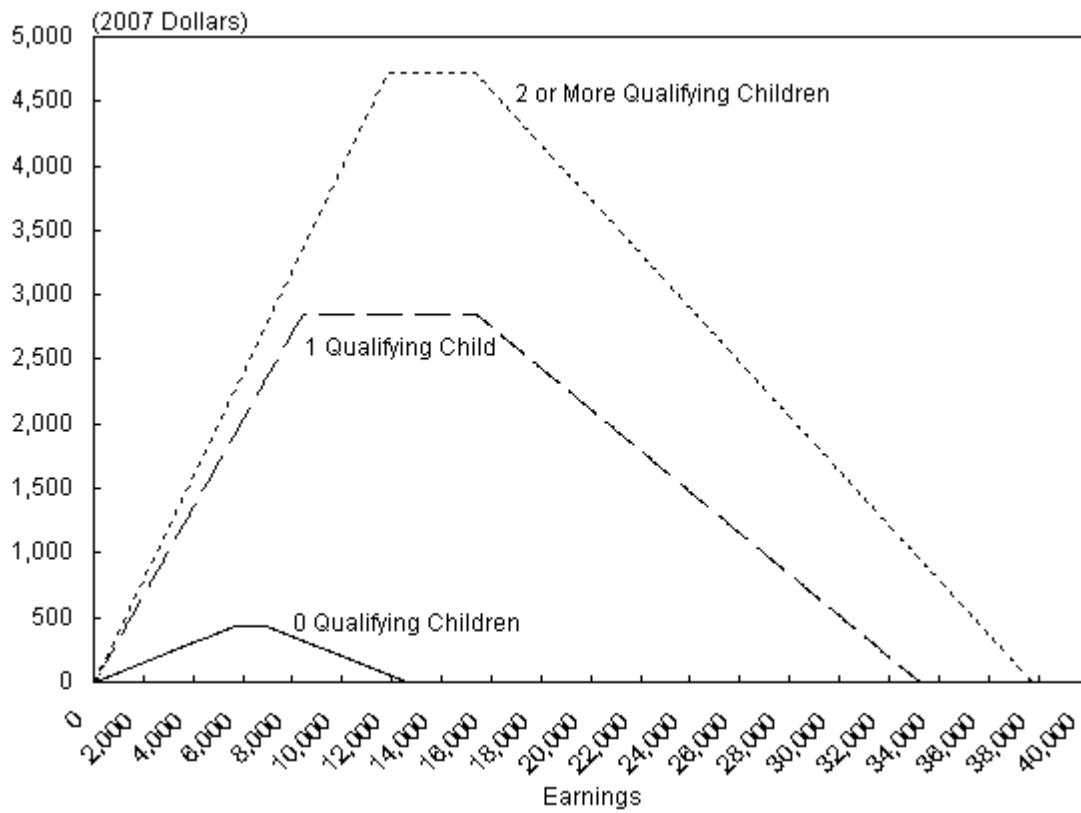
expanded in the 1990s. Today, the program is a major component of federal efforts to reduce poverty. In 2007 payments where the EITC exceeded the tax liability were \$38.3 billion. That year, food stamp outlays were \$34.9 billion and TANF outlays were \$16.9 billion (U.S. Office of Management and Budget, 2008).⁴

The amount of credit the worker receives is based on the taxpayer's earnings and income (which in the case of joint filers includes income from both spouses), number of children, and marital status. In 2007, the maximum EITC was \$428 for workers without qualifying children, \$2,853 for working families with one qualifying child, and \$4,716 for working families with two or more qualifying children. The amount of the credit initially increases as earnings increase until the maximum credit is achieved. After earnings exceed a certain level, the amount of the credit first remains constant and then decreases. Figure 1 displays how the amount of the EITC varied with earned income for non-joint filers by number of qualifying children in 2007.

As mentioned earlier, our identification strategy hinges on the differential treatment in the EITC of single mothers with one qualifying child and those with two or more qualifying children. Prior to the EITC expansions of the early 1990s, the treatment of parents with one child was virtually identical to those with two or more children. In 1994 the EITC increased for both groups, but more so for those with two or more children. (See Figure 2.) And between 1994 and 1997 the EITC continued to increase for those with two or more children while remaining relatively unchanged (in real terms) for those with one child. (See Figure 3.) For example, in 1994 the maximum credit available to a single mother with one child was \$2,819 (in 2007 dollars) while that available to a single mother with two or more children was \$3,497. By 1997, the maximum credit available to single mothers with one child increased by \$27 to \$2,847 (in 2007 dollars) while the maximum credit available to single mothers with two or more children increased by substantially more—\$1,212 to \$4,709 (again, in 2007 dollars).

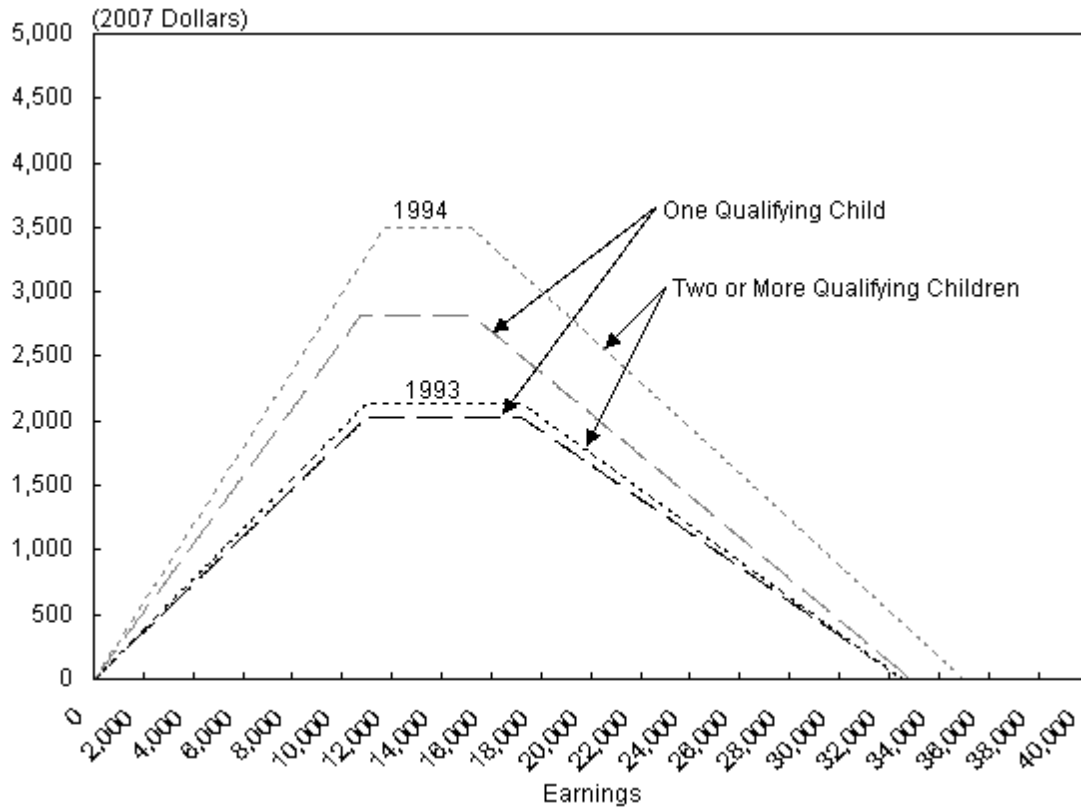
⁴Neither food stamps nor the EITC have any direct effect on a family's official poverty status, as defined by the Census Bureau, as neither are included in income.

Figure 1
EITC for Non-Joint Filers in 2007, by Number of Qualifying Children



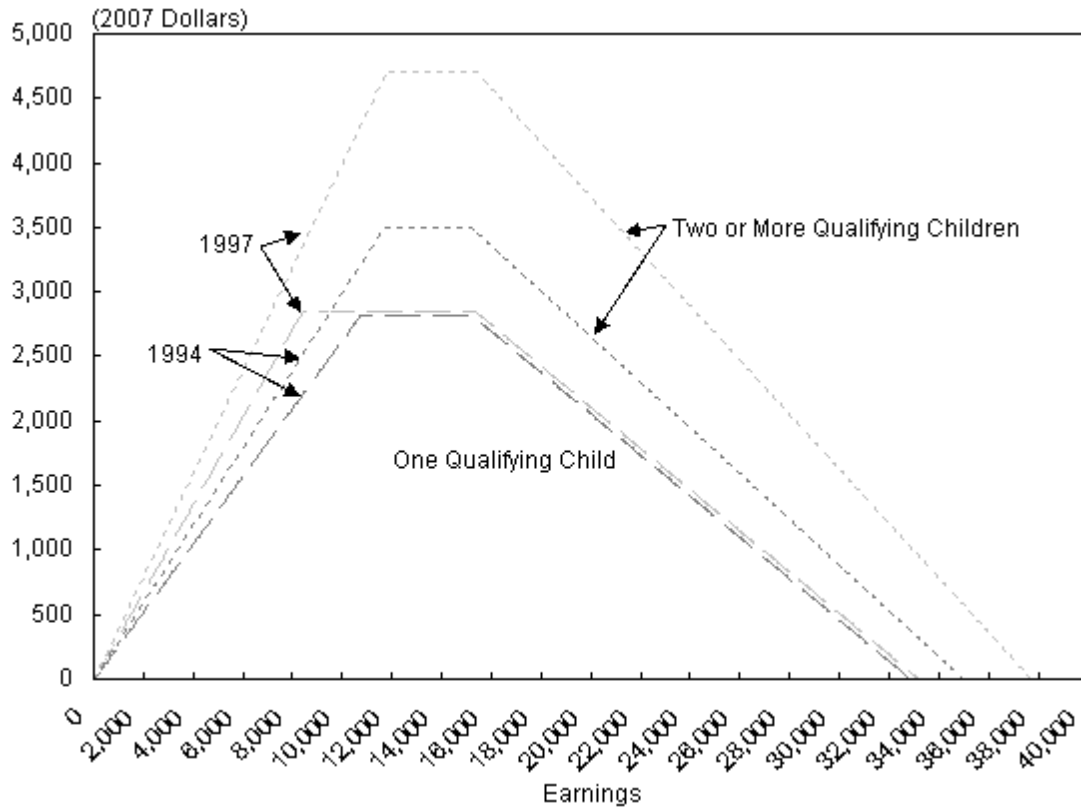
Source: Tax Policy Center, Urban Institute and Brookings Institution.

Figure 2
EITC for Non-Joint Filers with One or Two or More Qualifying Children, 1993 and 1994



Source: Tax Policy Center, Urban Institute and Brookings Institution.

Figure 3
EITC for Non-Joint Filers with One or Two or More Qualifying Children, 1994 and 1997



Source: Tax Policy Center, Urban Institute and Brookings Institution.

B. The Effects of the EITC on Employment, Marriage, and Fertility

Research has found that the EITC encourages work among single mothers, especially those with less education. There is no conclusive evidence that the substantial marriage penalty inherent in the structure of the EITC discourages marriage. Nor is there evidence to suggest that the structure of the EITC encourages births.

Hotz and Scholz (2003) provide an excellent treatment of the behavioral effects of the EITC, examining both the theoretical underpinnings as well as the empirical evidence available.

i. Effects on Employment of Single Mothers

The EITC, by increasing the returns to work, unambiguously encourages employment for low-income single parents. Numerous empirical studies have found evidence that the EITC does, in fact, encourage work among single mothers, especially those with less education (e.g., Eissa and Leibman, 1996; Meyer and Rosenbaum, 2000, 2001). Examining the 1987 expansion of the EITC and using a difference-in-differences strategy similar to that used in this analysis, Eissa and Liebman (1996) find an increase in labor force participation, but no change in hours of work, among women with children relative to women without children. Similarly, by comparing single women with children to those without children, Meyer and Rosenbaum (2000, 2001) find that a substantial portion of the increase in employment of single women with children between 1991 and 1996 was the result of the EITC. In the paper most closely related to ours, Hotz, Mullin, and Scholz (2005) employ a difference-in differences strategy in which the changes in employment of single mothers with two or more children are compared to those with exactly one child. Examining welfare recipients in California, they find that the EITC expansion of the early 1990s increased the employment of single mothers with two or more children relative to those with one child in the late 1990s.

ii. Marital Decisions

The structure of the EITC may penalize marriage for many low-income single mothers who work. If a working mother who is eligible for the EITC marries a man with earnings of his own, the combination of their earnings may reduce the EITC benefit received by the household.⁵ This may occur through a reduction in the credit received (if the combined earnings place the family in the phase-out range) or a complete elimination of the credit (if the combined earnings place the family outside of the EITC range). The fact that the EITC can create such marriage penalties has been well documented (Holtzblatt and Rebelein, 2000; Dickert-Conlin and Houser, 1998; CBO, 1997), though empirical evidence suggests that the marriage penalties associated with the EITC for single women are not large enough to affect marital decisions (Ellwood, 2000; Dickert-Conlin, 2002).⁶

If the EITC did discourage marriage among single mothers, then the larger increases in the EITC for single mothers with two or more children would induce more of those women to remain single mothers, thus changing the composition of single mothers with two or more children relative to those with one child over time. While it is unclear what the direction of the bias from this compositional change would be (Heckman, 1996), it is possible that if the EITC differentially discouraged marriage among those with two or more children relative to those with one child, we might see higher earnings growth among those with two or more children due to composition effects alone. However, the empirical evidence indicates that the EITC does not discourage single mothers from marrying, and thus provides support that our results are unlikely to be affected by compositional shifts (driven by marriage) in the group of women who are single mothers.

⁵This effect would be even greater if the man were also receiving the EITC prior to marriage.

⁶Eissa and Hoynes (1999) do find that the EITC increases marriage rates for very low-income tax payers. It should also be noted that the EITC can also include marriage bonuses, particularly for a non-earner.

iii. *Fertility Decisions*

The structure of the EITC, with higher payments to single parents with two or more children than those with one child, might encourage single mothers with one child to have additional children. Again, to the extent that this incentive translated into actual increases in higher-order fertility, the composition of our two comparison groups would be shifting over time. However, the available empirical evidence on the effects of the EITC on higher-order fertility suggests that this is not a cause for concern. Single mothers with one child do not appear to respond to the modest incentives in the EITC structure to have additional children. In fact, Baughman and Dickert-Conlin (forthcoming) find that the early 1990s expansions of the EITC were associated with “extremely small reductions in higher-order fertility among white women.”⁷

C. Dead-End Jobs

It may seem a forgone conclusion that single mothers pulled into employment by the EITC would experience subsequent increases in earnings. As mentioned, research suggests that the returns to labor market experience are large, even among less-skilled groups (Gladden and Tabor, 2000, 2006). However, a number of previous papers have examined whether individuals who gain employment in response to government programs tend to take “dead-end” jobs. For example, there is an extensive literature on whether individuals who are placed into employment with temp agencies have particularly low returns to experience. Autor and Houseman (2005, 2008) find that low-skilled workers who were placed into temp jobs by state employment agencies had worse labor market outcomes than workers placed into other jobs. On the other hand, Heinrich (2005) and Heinrich, et al. (2005), by contrast, find that women placed in temporary work do as well as women placed in other jobs.

⁷While the structure of the EITC also encourages first births, empirical evidence suggests this does not translate into increased first births among single women. This is less of an issue for our analysis, as the structure of the EITC encouraged first births prior to the EITC expansions in the early 1990s and the changes in the EITC for single mothers with one child during the early 1990s were not all that substantial. That is, even if there were a behavioral effect, we would not expect the composition of single mothers with one child to be changing over time due to that effect.

3. DATA AND METHODS

In this section, we discuss the data, our strategy for identifying the effect of the EITC on employment and earnings growth, and our empirical methods.

A. Data

We merged detailed demographic information from the 1993 and 1996 panels of the SIPP with longitudinal earnings records from SSA's Detailed Earnings Records (DER). Our sample is unmarried (widowed, divorced, or never married) women age 19 to 44 who are not disabled and not in school with at least one child. From the 1993 and 1996 panels of the SIPP we are able to draw a sample of single mothers in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999. We then match those women to their earnings records in the DER, obtaining detailed demographic information on a large sample of single mothers as well as their earnings from 1984 to 2005. Not all single mothers in the SIPP match to the administrative earnings records; the match rate varied from 83 to 87 percent between 1993 and 2000. Individuals in the SIPP may not be matched to an administrative earnings record because of erroneous or missing Social Security Numbers. Cristia and Schwabish (2006) show that the roughly 80 percent match rate in the 1996 panel does not introduce significant bias to the sample. Those that do not match are not included in the analysis. Within the 1993 and the 1996 panel, some of our single mothers will appear more than once; we correct our standard errors accordingly. Summary statistics for single mothers stratified by number of children (1 versus 2 or more) and by pre- and post-EITC expansion periods are provided in Appendix Table 1 and Appendix Table 2. Earnings are adjusted for inflation using the CPI-U-RS.

We use the combined SIPP-SSA file to examine earnings, as opposed to relying solely upon earnings data from the SIPP, for two reasons. First, since the SIPP panels are relatively short, it is not possible to examine longer-term earnings growth using those data alone. Second, both imputation methods and rates changed considerably between the 1993 and 1996 panels of the SIPP (see Dahl,

DeLeire, and Schwabish, 2008 and CBO, 2008). Imputation can affect measured earnings growth and differential rates of imputation over time could affect the results, as we are comparing earnings growth rates across groups and over time.

B. Identifying the Effect of EITC on Employment and Earnings Growth

As described above, the 1993 Omnibus Budget Reconciliation Act increased the credit for single mothers with two or more qualifying children relative to the credit for single mothers with only one child, between 1994 and 1997 (Figures 2 and 3). We use this differential change in the EITC to identify the effect of the EITC expansions on labor market outcomes. We compare the outcomes for two groups that are likely similar in most observable and unobservable ways—single mothers with exactly one child and single mothers with two or more children—but are differentially affected by the EITC expansions of the early 1990s. This identification strategy is similar to that used by many previous papers that estimate the impact of the EITC on employment. In particular, the use of single mothers with two or more children as the treatment group and single mothers with one child as the control group closely follows the identification strategy used by Hotz, Mullin, and Scholz (2005). A key assumption is that the trends in the labor market outcomes of these two groups of single mothers would not have differed had the changes in the EITC not taken place. As long as that is true, any difference between the two groups in labor market outcomes in the early 1990s can be attributed to the EITC.

C. Empirical Methods

We estimate a set of regression models to calculate our “difference-in-differences” estimates of the effects of the EITC on labor market outcomes. We first estimate models such as:

$$\begin{aligned} (E_{i,t-1+k} - E_{i,t-1}) = & \beta_0 + \sum_{t=1993}^{2000} \gamma_t (\text{year}_{i,t} = t) \times (\text{kids}_{i,t} \geq 2) + \sum_{t=1993}^{2000} \beta_t (\text{year}_{i,t} = t) \\ & + \gamma_0 (\text{kids}_{i,t} \geq 2) + \Theta X_{i,t} + \varphi_s + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where:

$E_{i,t}$ is log annual earnings of person i in year t ;

$Year_{it}$ is an indicator variable for the year in which demographics are measured;

$kids_{it} \geq 2$ is an indicator variable for having 2 or more children (versus exactly one child);

φ_s is a set of state indicator variables; and

$X_{i,t}$ is a vector of individual-level controls, including: marital status (widowed, divorced, never married), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school, high school, beyond high school), presence of children age 6 or less, age and age-squared. Demographic characteristics, including marital status and number of children, are measured at the time of the survey. Some single mothers may marry. Some with one child may have additional children. While these types of changes may be correlated with labor force decisions, we are unable to observe those changes that occur outside the survey window. In some specifications, we include state fixed effects to help control for geographic differences in the condition of local labor markets.

The coefficients on the interactions between the year variables and the indicator for having two or more children yield the “difference-in-differences” estimates. For example, when examining earnings growth from one year to the next, the first difference is between the growth rate in earnings from 1996 to 1997 for single mothers with two or more children in 1997 and the growth rate in earnings from 1996 to 1997 for single mothers with exactly one child. The second difference is between the growth rate in earnings from 1992 to 1993 for single mothers with two or more children in 1993 and the growth rate in earnings from 1992 to 1993 for single mothers with exactly one child in 1993. That is, the difference-in-differences estimate is:

$$\gamma_{1997} = \left[\Delta e_{1997-1996} (\text{single mothers})_{1997}^{2+\text{kids}} - \Delta e_{1997-1996} (\text{single mothers})_{1997}^{1\text{kid}} \right] - \left[\Delta e_{1993-1992} (\text{single mothers})_{1993}^{2+\text{kids}} - \Delta e_{1993-1992} (\text{single mothers})_{1993}^{1\text{kid}} \right]$$

To determine whether our results are consistent with previous findings, we also estimate a version of equation (1) on employment.

$$\begin{aligned} Emp_{i,t} = & \beta_0 + \sum_{t=1994}^{2000} \gamma_t (\text{year}_{i,t} = t) \times (\text{kids}_{i,t} \geq 2) + \sum_{t=1994}^{2000} \beta_t (\text{year}_{i,t} = t) \\ & + \gamma_0 (\text{kids}_{i,t} \geq 2) + \Theta X_{i,t} + \varphi_s + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where:

$Emp_{i,t}$ is an indicator variable for person i having positive earnings in year t , and all other variables are defined as in equation (1). This specification is very similar to that estimated by Hotz, Mullin, and Scholz (2005) and follows the spirit of earlier difference-in-differences studies including Eissa and Liebman (1996) and Meyer and Rosenbaum (2000).

4. RESULTS

In this section, we first report our main results on the effects of the EITC on year-over-year earnings growth and employment. Second, we report our results on longer-term earnings growth. Third, we report the results of our falsification test, examining the difference between single mothers with three or more children and those with exactly two children. Those two groups are treated identically by the EITC. To the extent that changes in the EITC are driving the differences between single mothers with one child and those with two or more children, we should not—and do not—see differences in earnings growth or employment between those two groups. Finally, we conduct a number of additional sensitivity tests, altering our definition of employment from that of any positive earnings to earnings above higher thresholds (\$500 or \$1000), as well as restricting our sample to single mothers to those with at most a high school degree (a group more likely to be receiving the EITC than the group of single mothers as a whole).

A. Main Results

Our results show that, in response to the 1993–1996 expansions in the EITC that occurred as a part of the 1993 Omnibus Budget Reconciliation Act, earnings growth among single mothers with two or more children grew faster than among single mothers with exactly one child. The higher rates of growth among single mothers with two or more children following the expansions of the EITC occur whether we examine one-, three-, or five-year growth rates.

In Table 1, we report the difference-in-differences estimates (from equation (1)) of the change in the earnings growth of single women with two or more children relative to the earnings growth of those with exactly one child, as well as the direct effect of having more than two children in 1993.⁸ The coefficient on having two or more children in 1993 is -0.050 and is not statistically significant. This suggests that between 1992 and 1993, prior to the EITC expansion, the earnings growth rates of single mothers with two or more children did not differ from those with one child (after controlling for demographic characteristics). By 1997, the coefficient on the interaction term is 0.191 (with a standard error of 0.072), indicating that between 1992–1993 and 1996–1997 the annual growth rate in earnings increased by 19 percentage points more for single mothers with two or more children than it did for single mothers with exactly one child. This larger increase in the one-year earnings growth rate for single mothers with two or more children relative to those with one child is also evident in 1998 and in 2000. Our estimates barely change if we include state fixed effects in the regression.

To generate results that are more easily compared to those in the literature, we estimate employment models (equation (2)) where employment is defined as having positive annual earnings. We report those results in columns (3) and (4) of Table 1. The estimates in column (3) suggest that after conditioning on race/ethnicity, education, marital status, presence of children under age 6, and age, the

⁸The difference-in-differences estimates of the change in the earnings growth of single women with two or more children relative to the earnings growth of those with exactly one child are represented by the coefficients on the interaction between the indicator for year and the indicator for having two or more children. The excluded category is those women who have exactly one child in 1993.

Table 1
The Effects of the EITC on Earnings Growth and Employment of Single Mothers

	Year-over-Year Earnings Growth		Employment	
	(1)	(2)	(3)	(4)
2+ Kids in 1994	0.098 (0.094)	0.093 (0.094)	0.017 (0.024)	0.021 (0.025)
2+ Kids in 1995	0.100 (0.090)	0.099 (0.090)	-0.015 (0.028)	-0.010 (0.028)
2+ Kids in 1996	0.099 (0.075)	0.096 (0.075)	0.036 (0.027)	0.042 (0.027)
2+ Kids in 1997	0.191 (0.072)**	0.185 (0.072)*	0.081 (0.027)**	0.086 (0.026)**
2+ Kids in 1998	0.133 (0.073)+	0.129 (0.073)+	0.035 (0.027)	0.038 (0.027)
2+ Kids in 1999	0.084 (0.072)	0.082 (0.072)	0.086 (0.027)**	0.086 (0.026)**
2+ Kids in 2000	0.135 (0.072)+	0.132 (0.072)+	0.062 (0.027)*	0.062 (0.026)*
No. Qualifying Kids \geq 2	-0.050 (0.062)	-0.050 (0.062)	-0.077 (0.023)**	-0.081 (0.022)**
Demographic controls	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes
State dummy variables	No	Yes	No	Yes
Observations	10,414	10,414	12,923	12,923
R-squared	0.02	0.02	0.08	0.09

Robust standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Notes:

Employment is defined as those with positive annual earnings.

Year-over-Year Earnings Growth is the difference in log annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Demographic controls include marital status (widowed, divorced, never married [excluded]), race/ethnicity (non-Hispanic white [excluded], non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school [excluded], high school, beyond high school), presence of children under age 6, age and age squared.

Source: Authors' calculations from the SIPP-SSA matched sample.

employment rates of single mothers with two or more children were roughly 8 percentage points lower than those of single mothers with exactly one child in 1993. By 1997 the employment rate of single mothers with two or more children had increased by roughly 8 percentage points more than the employment rate of single mothers with one child. (As a result, after conditioning on demographic characteristics, the employment rates of single mothers with two or more children were roughly equal to those of single mothers with one child in 1997.) The increases in employment between 1993 and 1999 and between 1993 and 2000 were also larger for single mothers with two or more children than they were for those with exactly one child. Once again, the results are not sensitive to the inclusion of state fixed effects.

These results suggest that the EITC expansions of 1994–1996 led to an increase in the employment rates of single mothers with two or more children (a group that was differentially affected by the EITC expansion) relative to those with only one child. The pattern of employment effects mirror those found by Hotz, Mullin, and Scholz (2005) when examining welfare recipients in California. Had that increase in employment been the result of those women becoming employed in ‘dead-end’ jobs, we might expect to see a relative decline in the year-over-year earnings growth of single mothers with two or more children as compared to those with exactly one child. Instead we see a relative increase in that earnings growth.

B. Longer-Term Earnings Growth

The SSA earnings records allow us to examine three-year and five-year earnings growth rates in addition to the one-year earnings growth rate reported in Table 1. The three-year growth rate in earnings for those women who were single mothers in 1993 (the ‘starting point’ for the difference-in-differences estimates) is given by $(\ln E_{1995} - \ln E_{1992})$ while the five-year growth rate in earnings for women who were single mothers in 1993 is given by $(\ln E_{1997} - \ln E_{1992})$.

These results are presented in Table 2. To ease comparison, Column 1 of Table 2 replicates the main results from Table 1. Examining three-year growth rates in earnings among single mothers in 1993, there was no difference in the earnings growth rates from 1992 to 1995 between those with two or more children and those with exactly one child (the coefficient on the indicator for whether there were two or more qualifying children is statistically insignificant in the second column). However, the change in earnings growth from 1992 to 1995 to earnings growth from 1994 to 1997 and from 1995 to 1998 was about 18 percentage points higher among single mothers with two or more children than among single mothers with exactly one child.

Examining five-year growth rates in earnings, there was no difference in the earnings growth rates from 1992 to 1997 between those with two or more children and those with one child. We see that the increase in the earnings growth of single mothers with two or more children between 1992–1997 and 1993–1998 is almost 18 percentage points larger than the change in the earnings growth rate of single mothers with exactly one child over that same period. The change in five-year earnings growth continues to be larger for those with two or more children than for those with exactly one child until 1997–2002. Thus, the EITC appears to have induced single mothers to take jobs with substantial earnings growth potential over at least a five-year period.

C. Falsification Test: Three or More Children versus Exactly Two Children

The EITC expansions that occurred between 1994 and 1996 did not differentiate in terms of the amount of the credit received between families with two children and families with three or more children. This lack of differentiation provides an opportunity to conduct a falsification test to determine whether factors other than the EITC are leading to differential earnings growth among single mothers with two or more children. To conduct this test, we compare the change in the earnings growth of single mothers with three or more children to that of single mothers with exactly two children (using an analog of equation (1)).

Table 2
The Effects of the EITC on Longer-Term Earnings Growth of Single Mothers

	Year-over-Year Earnings Growth (1)	Three-Year Earnings Growth (2)	Five-Year Earnings Growth (3)
2+ Kids in 1994	0.098 (0.094)	0.077 (0.109)	0.178 (0.108)+
2+ Kids in 1995	0.100 (0.090)	0.188 (0.112)+	0.270 (0.111)*
2+ Kids in 1996	0.099 (0.075)	0.182 (0.100)+	0.268 (0.103)**
2+ Kids in 1997	0.191 (0.072)**	0.134 (0.099)	0.174 (0.105)+
2+ Kids in 1998	0.133 (0.073)+	0.067 (0.100)	0.156 (0.106)
2+ Kids in 1999	0.084 (0.072)	0.058 (0.101)	0.113 (0.105)
2+ Kids in 2000	0.135 (0.072)+	0.141 (0.102)	0.026 (0.106)
No. Qualifying Kids \geq 2	-0.050 (0.062)	-0.022 (0.085)	-0.048 (0.087)
Demographic controls	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes
State dummy variables	No	No	No
Observations	10,414	10,100	9,768
R-squared	0.02	0.03	0.05

Robust standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Notes:

Earnings Growth is the difference in log annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Demographic controls include marital status (widowed, divorced, never married [excluded]), race/ethnicity (non-Hispanic white [excluded], non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school [excluded], high school, beyond high school), presence of children under age 6, age and age squared.

Source: Authors' calculations from the SIPP-SSA matched sample.

This comparison shows that there is no statistically meaningful difference between the changes in the one-year earnings growth of single mothers with three or more children and those of single mothers with exactly two children (see Table 3). The point estimates do suggest that, beginning with earnings growth between 1994 and 1995, earnings growth among single mothers with two children was increasing faster than that of single mothers with three or more children. However, because of the extreme lack of precision in those estimates, we cannot rule out that earnings growth was the same for the two groups.

D. Additional Sensitivity Tests

We conduct a number of additional sensitivity tests. In particular, we (a) vary the earnings threshold we use to define employment, and (b) restrict our sample of single mothers to those with a high school education or less. Our main results are robust to both of these tests.

i. Employment Definition

In the employment model presented above, we deem a person to be employed if they have positive earnings. We consider two alternative definitions of employment: having annual earnings greater than \$500 and having annual earnings greater than \$1,000.

Our employment results are completely robust to these alternative definitions of employment (see Table 4). For instance, across all specifications the employment of single mothers with two or more children increased by about 8 percentage points more than that of single mothers with exactly one child between 1993 and 1997.

ii. Sample Restriction: Less-Educated Single Mothers

Much of the previous literature on the employment effects of the EITC also examined the effects on a relatively low-skilled sample by either restricting the sample based on education (Eissa and Leibman, 1996; Meyer and Rosenbaum, 2000, 2001) or on a history of welfare receipt (Hotz, Mullin, and Scholz, 2005). To keep our sample sizes reasonably large ($n = 10,414$), we included all single mothers in our

Table 3
The Effects of EITC on Earnings Growth
Single Mothers with Two Children versus Three or More Children

	Year-over-Year Earnings Growth	
	(1)	(2)
3+ Kids in 1994	-0.031 (0.148)	-0.031 (0.147)
3+ Kids in 1995	-0.147 (0.147)	-0.138 (0.147)
3+ Kids in 1996	-0.136 (0.116)	-0.128 (0.116)
3+ Kids in 1997	-0.152 (0.111)	-0.141 (0.111)
3+ Kids in 1998	-0.129 (0.110)	-0.127 (0.111)
3+ Kids in 1999	-0.170 (0.110)	-0.167 (0.110)
3+ Kids in 2000	-0.100 (0.110)	-0.092 (0.110)
No. Qualifying Kids ≥ 3	0.162 (0.094)+	0.156 (0.094)+
Demographic controls	Yes	Yes
Year dummy variables	Yes	Yes
State dummy variables	No	Yes
Observations	5,377	5,377
R-squared	0.02	0.02

Robust standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Notes:

Year-over-Year Earnings Growth is the difference in log annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Demographic controls include marital status (widowed, divorced, never married [excluded]), race/ethnicity (non-Hispanic white [excluded], non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school [excluded], high school, beyond high school), presence of children under age 6, age and age squared.

Source: Authors' calculations from the SIPP-SSA matched sample.

Table 4
The Effects of EITC on Employment of Single Mothers: Alternative Definitions of Employment

	Definition of Employment					
	Earnings > \$0		Earnings ≥ \$500		Earnings ≥ \$1,000	
	(1)	(2)	(3)	(4)	(5)	(6)
2+ Kids in 1994	0.017 (0.024)	0.021 (0.025)	0.002 (0.025)	0.006 (0.025)	-0.009 (0.026)	-0.005 (0.026)
2+ Kids in 1995	-0.015 (0.028)	-0.010 (0.028)	-0.020 (0.029)	-0.016 (0.029)	-0.039 (0.029)	-0.035 (0.029)
2+ Kids in 1996	0.036 (0.027)	0.042 (0.027)	0.022 (0.028)	0.029 (0.028)	0.019 (0.029)	0.026 (0.029)
2+ Kids in 1997	0.081 (0.027)**	0.086 (0.026)**	0.080 (0.028)**	0.085 (0.028)**	0.068 (0.028)*	0.073 (0.028)**
2+ Kids in 1998	0.035 (0.027)	0.038 (0.027)	0.044 (0.028)	0.047 (0.028)+	0.042 (0.029)	0.046 (0.029)
2+ Kids in 1999	0.086 (0.027)**	0.086 (0.026)**	0.084 (0.028)**	0.084 (0.028)**	0.082 (0.029)**	0.084 (0.028)**
2+ Kids in 2000	0.062 (0.027)*	0.062 (0.026)*	0.063 (0.028)*	0.064 (0.028)*	0.066 (0.029)*	0.068 (0.028)*
No. Qualifying Kids ≥ 2	-0.077 (0.023)**	-0.081 (0.022)**	-0.076 (0.024)**	-0.080 (0.023)**	-0.075 (0.024)**	-0.080 (0.024)**
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
State dummy variables	No	Yes	No	Yes	No	Yes
Observations	12,923	12,923	12,923	12,923	12,923	12,923
R-squared	0.08	0.09	0.10	0.11	0.11	0.12

Robust standard errors in parentheses.

+ significant at 10%; * significant at 5%; ** significant at 1%

Notes:

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Demographic controls include marital status (widowed, divorced, never married [excluded]), race/ethnicity (non-Hispanic white [excluded], non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school [excluded], high school, beyond high school), presence of children under age 6, age and age squared.

Source: Authors' calculations from the SIPP-SSA matched sample.

main results. Since one would expect the EITC to primarily impact the labor market outcomes of less-skilled workers, we also restrict our sample to women with a high school education or less ($n = 5,526$).

The results (see Table 5) are very similar to those that include all single mothers. After conditioning on demographic characteristics, earnings growth between 1992 and 1993 among less-educated single mothers with two or more children did not differ from that of less-educated single mothers with exactly one child. By 1997, earnings growth increased by 19 percentage points more for less-educated single mothers with two or more children than for less-educated single mothers with exactly one child.

Similarly, employment rates increased by roughly 8 percentage points more among less-educated single mothers with two or more children, relative to less-educated single mothers with one child between 1993 and 1997.

5. CONCLUSIONS

The EITC has repeatedly been found to increase the employment rates of single mothers. However, no study to date has examined whether the jobs taken by single mothers as a result of the EITC incentives were “dead-end” jobs or jobs that had the potential for earnings growth. In this study, we find no evidence that the single mothers who were induced to take jobs as a result of the EITC expansions that occurred between 1994 and 1996 took “dead-end” jobs. If anything, these women exhibit larger increases in earnings growth than other similar women.

One puzzle is that most of the employment and earnings growth effects do not take place until 1997 and later. The expansions began in 1994 and continued until 1996. This lag in effects is consistent with what Hotz, Mullin, and Scholz (2005) found using administrative data from California and may be due, in part, to the EITC expansion not being fully implemented for families with two or more children until 1996.

Table 5
The Effects of the EITC on Earnings Growth and Employment of Single Mothers with a High School Education or Less

	Year-over-Year Earnings Growth		Employment	
	(1)	(2)	(3)	(4)
2+ Kids in 1994	0.131 (0.147)	0.126 (0.147)	0.012 (0.037)	0.013 (0.037)
2+ Kids in 1995	0.016 (0.144)	0.015 (0.144)	-0.041 (0.041)	-0.041 (0.041)
2+ Kids in 1996	0.098 (0.115)	0.091 (0.115)	0.024 (0.038)	0.024 (0.038)
2+ Kids in 1997	0.196 (0.112)+	0.191 (0.112)+	0.085 (0.037)*	0.081 (0.037)*
2+ Kids in 1998	0.150 (0.113)	0.151 (0.113)	0.032 (0.038)	0.031 (0.037)
2+ Kids in 1999	0.020 (0.112)	0.017 (0.112)	0.088 (0.037)*	0.085 (0.037)*
2+ Kids in 2000	0.132 (0.110)	0.136 (0.111)	0.047 (0.037)	0.042 (0.037)
No. Qualifying Kids \geq 2	-0.053 (0.097)	-0.057 (0.097)	-0.076 (0.031)*	-0.077 (0.031)*
Demographic controls	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes
State dummy variables	No	Yes	No	Yes
Observations	5,526	5,526	7,438	7,438
R-squared	0.01	0.02	0.09	0.11

Robust standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Notes:

Employment is defined as those with positive annual earnings.

Year-over-Year Earnings Growth is the difference in log annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family, and a high school education or less. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Demographic controls include marital status (widowed, divorced, never married [excluded]), race/ethnicity (non-Hispanic white [excluded], non-Hispanic black, Hispanic, non-Hispanic other), education (less than high school [excluded], high school), presence of children under age 6, age and age squared.

Source: Authors' calculations from the SIPP-SSA matched sample.

Our finding that EITC recipients who were induced to take jobs experience subsequent earnings growth should be useful information for any cost-benefit analysis of future expansions of the EITC. To the extent that the jobs taken by EITC recipients have low potential for earnings growth, the “bang for the buck” of the EITC is reduced. Moreover, in the absence of subsequent earnings growth, EITC recipients might continue to receive the credit for many years, driving up the costs of the program. If, through earnings growth, recipients quickly move onto the “phase-out” range of the credit or off the credit entirely, the cost of the EITC in terms of forgone tax revenues is diminished.

Our results suggest that once a single mother becomes employed, she will develop the skills needed to increase her earnings. The EITC encourages work among single mothers, and that work continues to pay off through future increases in earnings.

Appendix Table 1
Summary Statistics for Year-Over-Year Earnings Growth Sample

Variable	Full Sample		Two or More Qualifying Children		One Qualifying Child	
	1993–1996	1997–2000	1993–1996	1997–2000	1993–1996	1997–2000
Year-over-Year Earnings Growth	0.15	0.12	0.11	0.12	0.18	0.13
Marital Status						
Widowed	2.6	3.1	2.4	2.0	2.8	4.1
Divorced	43.7	46.1	41.0	41.3	46.1	50.7
Never Married	53.8	50.8	56.6	56.7	51.1	45.2
Race						
Non-Hispanic White	55.9	58.7	63.9	65.3	48.5	52.4
Non-Hispanic Black	28.8	26.5	24.1	23.0	33.1	29.9
Non-Hispanic Other	3.4	3.1	2.8	3.0	3.9	3.2
Hispanic	12.0	11.7	9.1	8.7	14.6	14.6
Education						
Less than High School	14.2	14.1	10.2	9.9	17.9	18.0
High School Graduate	39.4	38.3	37.4	38.6	41.2	38.0
Some College or More	46.4	47.7	52.4	51.5	40.9	44.0
Presence of Children under age 6	39.6	40.4	30.1	33.7	48.5	46.8
Age	31.6	31.4	31.5	30.8	31.7	31.9
Number of Observations	6,206	4,208	2,987	2,050	3,219	2,158

Notes:

Year-over-Year Earnings Growth is the difference in log annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Source: Authors' calculations from the SIPP-SSA matched sample.

Appendix Table 2
Summary Statistics for Employment Sample

Variable	Full Sample		Two or More Qualifying Children		One Qualifying Child	
	1993–1996	1997–2000	1993–1996	1997–2000	1993–1996	1997–2000
Percent Employed	88.9	81.9	91.5	87.5	86.7	77.3
Marital Status						
Widowed	3.1	3.2	2.6	2.3	3.6	4.0
Divorced	42.0	42.6	40.7	39.9	43.1	44.7
Never Married	54.9	54.2	56.7	57.8	53.4	51.3
Race						
Non-Hispanic White	54.6	55.0	63.5	63.8	47.0	47.9
Non-Hispanic Black	28.9	27.7	24.1	23.2	33.0	31.2
Non-Hispanic Other	3.6	3.2	3.1	3.1	4.0	3.3
Hispanic	12.9	14.1	9.4	9.8	16.0	17.6
Education						
Less than High School	17.1	20.3	11.7	13.4	21.8	25.9
High School Graduate	39.5	38.5	38.1	39.4	40.7	37.7
Some College or More	43.4	41.2	50.2	47.1	37.5	36.5
Presence of Children under Age 6						
	42.5	46.3	31.8	36.3	51.7	54.3
Age	31.5	31.0	31.5	30.7	31.5	31.3
Number of Observations	7,358	5,565	3,394	2,480	3,964	3,085

Notes:

Employment is defined as those with positive annual earnings.

Sample: Single women, age 19 to 44, not in school, not disabled, with a person age 18 or younger or age 19 to 24 and enrolled in school in the family. Sample drawn in January 1993, 1994, 1995, March 1996, January 1997, 1998, 1999, and November 1999.

Source: Authors' calculations from the SIPP-SSA matched sample.

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