DOES A HIGHER MINIMUM WAGE ENHANCE THE EFFECTIVENESS OF THE EARNED INCOME TAX CREDIT? *

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Abstract

We explore how the effects of the Earned Income Tax Credit (EITC) are influenced by the level of the minimum wage. Our results indicate that the EITC boosts employment and earnings for single women with children, and coupling the EITC with a higher minimum wage enhances this positive effect. In contrast, employment and earnings of less-skilled minority men and women without children are more adversely affected by the EITC when the minimum wage is higher. At the family level, a higher minimum wage increases the poverty-reducing effects of the EITC for families with children; in that sense, a higher minimum wage does appear to enhance the effects of the EITC. But whether or not the policy combination of a high EITC and a high minimum wage is viewed as favorable or unfavorable depends in part on whom policymakers are trying to help.

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I. Introduction

The Earned Income Tax Credit (EITC) was enacted in 1975 and has, over time, become a staple of U.S. antipoverty policy. At the federal level, significant expansions in the generosity of the credit took place in the 1980s and 1990s, boosting the credit rate from 10% in 1984 to 40% (with two children) in 1996, where it has remained since. In addition, some states have introduced their own EITC programs, which typically provide families in the state with a percentage supplement to the federal EITC. The number of states with such an EITC increased from seven states in 1996 to 19 states and the District of Columbia in 2007, raising the percentage of the 16-64 year-old population residing in states supplementing the federal EITC from 14% to nearly 40%.[1]

Previous studies of the EITC typically find that this program is effective at increasing the labor force attachment and earnings of low-income women and families with children. For example, Eissa and Liebman (1996) show that the federal EITC increases employment of young, unskilled women with children, Meyer (2002) concludes that a higher federal or state credit boosts employment of single mothers, and Liebman (1998) and Scholz (1994) find that a large proportion of EITC payments go to poor families.[2] Similarly, our own previous research indicates that the EITC outperforms the minimum wage in terms of its beneficial effects on the distribution of family earnings.[3]

However, some researchers point out that the labor supply response associated with the EITC may cause the market wage to fall.[4] If so, some of the gains from the EITC that are intended for eligible

[1] This calculation is based on the CPS data described below. The 19 states with EITC supplements in 2007 were Delaware, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Jersey, New Mexico, New York, Oklahoma, Oregon, Rhode Island, Vermont, Virginia, and Wisconsin, and the supplemental EITC in those states ranges from 4 to 43% of the federal credit. In addition, EITC supplements became effective in 2008 in Louisiana, Michigan, and North Carolina.

[2] Extensive surveys of previous research on the EITC can be found in Hoffman and Seidman (2003) and Hotz and Scholz (2003). Leigh (2005) also finds evidence of a positive supply response on the intensive margin (hours). The only study we know of that fails to find positive labor supply effects on those likely to be eligible for the EITC is Cancian and Levinson (2005), which examines the effects of Wisconsin's higher EITC supplement for families with three children.

[3] Indeed, the minimum wage appears to have no beneficial effects on low-income families and may even adversely affect them. See Neumark and Wascher (2001), as well as Burkhauser et al. (1996) and Neumark and Wascher (forthcoming).

[4] See, for example, Leigh (2007) and Rothstein (2008), who find that an increase in the generosity of the EITC puts downward pressure on the wages of low-skilled workers already in the labor market. One might expect employers of low-wage workers to favor the EITC (over, for example, the minimum wage) if the incidence of the

workers will instead be reaped by employers, and there may be negative spillovers on the wages and incomes of low-skilled workers not eligible for the EITC.[5] In light of these potential general equilibrium effects, some economists and policymakers have recently pointed to the minimum wage as a way to mitigate any fall in wages. In particular, these advocates claim that the EITC and the minimum wage may be mutually reinforcing (i.e., complementary), with a higher minimum wage enhancing the effectiveness of the EITC in helping poor and low-income families.[6]

In this paper, we examine potential interactions between the EITC and the minimum wage. We begin in the next section of the paper with a theoretical discussion of how these two policies might interact, noting that some models suggest that the two policies are reinforcing, while others suggest that they are offsetting, at least for some subgroups of the population. To preview that discussion, the explanation we regard as most compelling begins by allowing for heterogeneity of individuals who would earn wages near the minimum if they worked. In that case, either a minimum wage or an EITC can induce some individuals to enter the labor market, perhaps (especially in the case of the minimum wage) displacing others of lower productivity.[7] However, there may be other individuals with higher reservation wages who enter the labor market only when there is both a high minimum wage and a more generous EITC. If these individuals are the ones to whom we would like to try to redistribute income (e.g., if single mothers with children have particularly high reservation wages among roughly comparably-skilled workers), then combining the EITC with a higher minimum wage may enhance the beneficial distributional effects of the EITC.

EITC is on workers. Although it is difficult to establish explicitly whether businesses support particular policies, once piece of evidence in this regard is that the Employment Policies Institute, which reportedly receives funding from the restaurant industry (Greenhouse, 2006; Kilborn, 1997), strongly favors the EITC over the minimum wage (Garthwaite, 2004).

[5] As explained below, a very small EITC payment is available to families without children. As a result, many low-skilled workers (unless they are under age 25 or over age 64) are not strictly "ineligible" for the EITC but rather are simply unlikely to gain much from it. We use "ineligible" as a short-hand for those who are not eligible for the much more generous EITC available to families with children.

[6] See, e.g., Bernstein (2004), Fiscal Policy Institute (2004), and Levitis and Johnson (2006).

[7] The conventional theory does not imply that employment of any particular subgroup will decrease in response to a higher minimum wage; it only predicts that overall labor demand for less-skilled workers will fall. In particular, individuals for whom the market wage was previously below the reservation wage could, after a minimum wage increase, be drawn into the labor force. For example, Neumark and Wascher (1996) find that an increase in the minimum wage induces some higher-skilled teenagers to leave school and enter the labor market.

On the other hand, for groups less likely to be eligible for the EITC, such as teenagers and low-skilled adult males, a high minimum wage coupled with an EITC could represent a "double hit," with the minimum wage reducing their employment prospects via the higher wage floor imposed on employers, and the EITC reducing their employment prospects via the increased supply of women entering the labor market. Thus, the effects of interactions between these policies, and how these interactive effects vary across different groups, are potentially quite complex. Widespread interest in the effectiveness of these policies at the federal level, along with the increasing number of states implementing state EITCs as well as higher state minimum wages, makes it important to study how they interact.

II. Minimum Wage-EITC Interactions

The limited research that compares the effects of minimum wages and the EITC has generally not considered the potential for interactions between the two policies. However, the policies are not mutually exclusive, and, in practice, many individuals are subject to both, raising the possibility that such interactions could arise. Indeed, several arguments as to how a higher minimum wage could enhance the effectiveness of the EITC have been put forward. Although some are clearly invalid, others are possible but require empirical testing to which they have not yet been subjected.

One argument often made by minimum wage advocates is that a higher minimum wage is needed to prevent or mitigate the reduction in market wages associated with the labor supply response to a more generous EITC. In the simplest model of the labor market—a competitive labor market with homogeneous labor—it is clearly wrong to argue that a higher minimum wage will enhance the effectiveness of the EITC. In this setting, the EITC induces a labor supply increase among eligible individuals that, in the absence of a minimum wage, would be expected to result in a lower wage and higher employment for low-wage workers. A minimum wage will reduce the extent to which the wage can fall in response to the increase in labor supply, but this will, in turn, reduce the job opportunities available to individuals who enter the labor market because of the EITC. In the extreme case in which all EITC eligible individuals are priced out of the labor market by the minimum wage, the EITC would not result in any change in employment, but only in an increase in unemployment. In a less extreme case, the

EITC induces those with children to enter the labor market, and the burden of excess labor supply is shared between EITC eligibles and ineligibles, so it might appear that the combined policies have distributional benefits from shifting employment towards those eligible for the EITC. But clearly *without* the minimum wage more of the EITC eligibles would be employed.

This intuition is illustrated in Figure 1. In the absence of a minimum wage or an EITC, the equilibrium levels of employment (E_0) and the market wage (W_0) are determined by the intersection of the labor demand curve (L^D) and the labor supply curve (L^S). If an EITC is implemented, which we oversimplify by modeling it as a simple tax credit,[8] then the labor supply curve shifts out to L_S', with equilibrium employment level E_1 (and a lower market wage W_1). If a minimum wage of W_{min} is introduced as well, the wage does not fall as far. But the minimum wage reduces employment, generating excess labor supply $E_1 - E_{min}$. Indeed, if the minimum wage is set at W_0, the EITC has no effect on the labor market, except to increase the excess of labor supply over the quantity of labor demanded to $E_1 - E_0$. That is, the minimum wage inevitably leads to lower employment and a higher wage than would be the case with the EITC; the EITC simply determines the wage and employment level that would otherwise prevail. Any claims about the effectiveness of the minimum wage boil down to the usual debate, and are not related to interactions between the two policies.

This analysis also undermines the argument that the minimum wage needs to keep up with inflation (whether by formal indexation or by more frequent increases) to maintain the effectiveness of the EITC. Proponents of the minimum wage note that because the maximum credit that a family can receive is indexed to inflation while the minimum wage is not, a family that receives the EITC and for which earnings partly depend on minimum wage work will tend to face a declining real EITC payment when the real value of minimum wage declines.[9] However, this argument ultimately rests on the idea that a higher minimum wage—regardless of the generosity of the EITC—will help low-income families and thus is really an argument about the distributional effects of the minimum wage rather than an argument

[8] The discussion ignores variation in the size of the credit with family income and family structure. But the qualitative effect of increasing labor supply is captured in the figure.

[9] See Economic Policy Institute (2004).

that a higher minimum wage increases the effectiveness of the EITC. In this regard, the research literature fails to find positive distributional effects of the minimum wage,[10] suggesting that an EITC coupled with a higher minimum wage will likely lead to poor and low-income families being worse off than they would be with just the EITC.

Thus, different arguments are needed to make the case that a higher minimum wage complements the EITC. One route would be to drop the assumption of a competitive labor market. For example, some researchers have claimed that low-skilled labor markets are better characterized by monopsony power stemming from labor market frictions.[11] In such a case, a minimum wage could increase employment and earnings of less-skilled workers, making more of them eligible for EITC payments or raising the size of the payments for which they are eligible. However, our recent exhaustive review of the effects of minimum wages on employment concludes that the body of evidence is much more consistent with the competitive model of labor markets (Neumark and Wascher, 2007a).

An alternative argument is that a higher minimum wage may reduce the distortionary impact of the EITC on labor supply. In particular, a higher minimum wage enables a family to achieve the same level of income (earnings plus EITC) at the maximum EITC credit with a smaller EITC payment. This, in turn, results in a lower marginal tax rate over the phase-out range of the credit, which could reduce the associated labor supply disincentives (Blank and Schmidt, 2001). However, this argument is really about how the EITC parameters get set rather than about the minimum wage. In particular, it does *not* imply that, for a *given* set of EITC parameters, a minimum wage makes the EITC more effective in reducing poverty or helping low-income families. Rather, it suggests that with a higher minimum wage we might observe a different set of EITC parameters that have better distributional effects than the EITC parameters chosen when the minimum wage is lower. As this hypothesis is not explicitly about minimum wage-EITC interactions, testing it is beyond the scope of this paper.

[10] For a review of the evidence, see Neumark and Wascher (forthcoming).
[11] See, for example, Manning (2003) and Machin and Manning (1994).

As noted in the Introduction, a more promising avenue for motivating interactions between minimum wages and the EITC in terms of their effects on low-income families is to allow for heterogeneity of individuals who would earn wages near the minimum if they worked. Suppose that there are two types of workers: teenagers in middle-income families (ineligible for the EITC) with a low reservation wage; and poor single mothers who are eligible for the EITC, are slightly more productive than teenagers, and have significantly higher reservation wages, perhaps because of fixed costs of working (e.g., making arrangements for child care). In the absence of a minimum wage and with no EITC, the difference in reservation wages can lead to a situation in which the teenagers are employed while the single mothers are not.

Suppose we just raise the minimum wage. For a sufficiently high minimum some teenagers will become non-employed. Demand will shift towards more-skilled single mothers, but the market wage (or the higher minimum) may still fall short of their reservation wage. In this case, the minimum wage delivers no benefit to poor single mothers because none of them are drawn into the labor market. If we just raise the EITC (in particular, the phase-in rate), the effective wage may still fall short of the reservation wage, in which case teenagers will continue to be employed (since their wage has not changed) and poor single mothers are again no better off. However, a higher EITC *coupled with* a higher minimum wage may raise the effective wage above the reservation wage of single mothers, leading to more substitution of single mothers for teenagers, and hence better distributional effects of the EITC; by the same argument, this effect of the EITC is enhanced for a higher minimum wage relative to a lower minimum wage, which gives rise to an interactive effect.[12]

The case for single mothers (assumed here to face a fixed cost of employment) is depicted in Figure 2. The individual's indifference curves between non-working time (t) and earnings (w·[T-t]) are given by the curved lines, while the budget constraint at the market wage is given by the solid line (with maximum earnings of wT). Because of the fixed cost of employment, the individual does not work in the

[12] If mothers are no more productive than teenagers, then although more mothers may be drawn into the labor market, employers are indifferent between the two groups and so demand does not shift toward them. In this case, the qualitative effect would be the same, but it would be weaker.

absence of a minimum wage or an EITC. Moreover, neither the minimum wage in isolation (which shifts the budget constraint to the dotted and dashed line) nor the EITC in isolation (the dotted line) is sufficient to induce labor market entry. In contrast, the combined policy of both a minimum wage and an EITC (the dashed line) raises the return to work by enough to induce labor market entry. Of course, policymakers could devise a set of EITC parameters in isolation that would yield the same interior solution depicted in Figure 2. But fiscal concerns or fears over introducing stronger distortions on the phase-out range may place constraints on setting EITC parameters in this way. Indeed, as a consequence of the potential for labor supply disincentives with a very high EITC, it is not only possible that a higher minimum wage could enhance the positive distributional effects of the EITC, but also that the distributional effects of a minimum wage and a modest EITC are better than those of a high EITC that generates the same effective wage along the phase-in range.[13]

Figure 2 illustrates how a higher minimum wage could enhance the effectiveness of the EITC. However, it is also possible that a higher minimum wage will reduce the effectiveness of the EITC. In particular, if the wages of those eligible for the EITC are already bound by the minimum wage, then a further increase in the wage floor will just reduce their employment relative to the case of an EITC in isolation (taking us back to a case similar to that depicted in Figure 1).

In addition, low-skilled individuals who are *not* eligible for the EITC can take a double hit from a high minimum wage coupled with an EITC, with the minimum wage reducing their employment prospects via the higher wage imposed on employers, and the EITC reducing their employment prospects via the increased supply of EITC eligible individuals. For example, in the model described above, the minimum wage plus EITC combination leads to more labor market entry by the higher-skilled workers—single mothers—and hence more disemployment of the lower-skilled workers—teenagers, in that example, but more generally low-skilled individuals without children. However, it is possible that in this

[13] Estimates of the regression models described below can be used to simulate the distributional effects of alternative policy combinations and parameters—but such simulations are likely reliable only within the range of the data.

case the effects are not multiplicative but rather simply additive—something we will test in the empirical work.

The past decade is a propitious period in which to study the effects of policy interactions between the minimum wage and the EITC. Paralleling the rapid proliferation of state EITCs has been a similar expansion in state minimum wages, with the number of states with minimum wages above the federal minimum rising to 29 (plus the District of Columbia) as of the beginning of 2007. At the same time, focusing on the post-welfare reform period lets us abstract from major changes in work incentives associated with the transition from AFDC to TANF. Although welfare policies continued to change after TANF was enacted in 1996, preliminary analyses indicated that key welfare reforms such as time limits and work requirements did not have discernible effects on the dependent variables we study, and so we focus on minimum wage-EITC interactions.[14]

III. Data

We combine data on wages, employment, hours, and earnings (individual and family) with state-level information on minimum wages and earned income tax credits for the period 1996 to 2007. The minimum wage data are compiled from annual summaries of federal and state labor legislation reported each year in the Department of Labor's *Monthly Labor Review*.[15] Most state minimum wages equal or exceed the federal minimum wage, although some states have a minimum wage below the federal level, often applying to small groups of workers not covered by the federal law. Because we do not have the detailed information on who is covered by state law and because coverage of the federal minimum wage is extensive, we simply use the higher of the state or federal minimum as the effective state minimum.

The information on state EITCs comes from a series of reports published by the Center on Budget and Policy Priorities. State EITCs specify a percentage of the federal EITC that is paid to state taxpayers via the state income tax system, as a "supplement" to the federal EITC. Our state EITC variable is this

[14] This is not to say that the change from AFDC to TANF had no effects on labor market outcomes. Our sample period begins in 1997 and thus covers the post-welfare reform period. As a result, the welfare reform effects we can identify are mainly the effects of minor timing differences between the states and variation in the state policies adopted. Some of these earlier results are described in Neumark and Wascher (2007b).

[15] We start with the minimum wage in each month; in the analysis with the annual CPS files we use the average minimum wage over the year.

percentage. In two states, this percentage varies with the level of income and/or with the number of children. For Wisconsin, where the supplement varies with the number of children, we use the supplement for families with two children (14%). Minnesota's EITC is not specified as a simple percentage of the federal credit, so we use the reported average supplement of 33%.[16] Although the state credit is refundable in most states, a few states have a nonrefundable (or only partially refundable) credit and in a couple of states the recipient has a choice; for these latter states, we use the refundable rate on the presumption that most eligible families would prefer that rate. (A refundable EITC gives money back to the family even if there is no tax liability, whereas a non-refundable EITC only reduces any existing tax liability.) Over the sample period we use, the federal EITC was unchanged with a phase-in tax credit of 40% for families with two or more children, and 34% for families with one child. The federal EITC also provides a very small credit of 7.65% to those without children.[17]

We merge these state-level policy variables with data from CPS Annual Demographic Files (ADF).[18] The ADF files are used to construct individual-level measures of wages, employment (worked any time last year), and annual hours, as well as demographic and human capital indicators. In addition, we use the ADF files to construct family-level measures of annual earnings and the poverty line for each family. Finally, we append to each record the state unemployment rate in each year to control for variation in economic conditions at the state-by-year level. The unemployment rate is potentially endogenous, but by using the state-wide unemployment rate (from the Local Area Unemployment Statistics) rather than a rate for groups more strongly affected by the minimum wage, we hope to capture the exogenous influence of changes in aggregate demand.[19]

IV. Methods

[16] See http://www.stateeitc.com.

[17] In addition to the phase-in rate, the EITC establishes a maximum credit (in 2007, $4,716 for families with two or more children, $2,853 for families with one child, and $428 for those with no children), a "plateau" or income range over which the maximum benefit remains fixed (in 2007, for families with two or more children, from $11,791-$15,399), and a phase-out rate at which the credit is reduced as income rises further (currently 21.06% for families with two or more children).

[18] We also use monthly outgoing rotation group (ORG) files for some limited analyses.

[19] We also experimented with the inclusion of state real GDP growth per capita in the various specifications we estimate. However, the estimated coefficient of this variable was never statistically significant (in contrast to the estimated coefficient of the unemployment rate), and its inclusion had no impact on the results, so we omit it in the specifications reported in the paper.

We use a reduced-form approach to estimate the effects of the interactions between the EITC and minimum wages on labor market outcomes. In principal, one could estimate a structural model of labor supply in the context of a non-linear budget constraint that incorporates changes in both the EITC and the minimum wage (as well as other policy changes).[20] However, a reduced-form approach allows us to more naturally extend the prior literature that focuses on the effects of the EITC on labor supply and poverty (e.g., Cancian and Levinson, 2005; Eissa and Liebman, 1996; Eissa and Hoynes, 2004; Neumark and Wascher, 2001) by expanding the specifications used in these studies to incorporate interactions between the EITC and the minimum wage. In addition, many potentially eligible individuals have imperfect information about the EITC, and most workers are not able to freely choose their work hours over the course of the year (Liebman, 1998; Romich and Weisner, 2000), which may limit the appeal of using an approach based on utility maximization with respect to an explicit non-linear budget constraint.[21] Nonetheless, it is clear that the structural and reduced-form approaches are complementary.

We estimate models for employment, hours, wages, earnings, and family earnings relative to poverty thresholds for a variety of demographic and skill groups.[22] The earnings estimates are unconditional rather than conditional on employment, so that the estimates reflect changes on both the extensive (employment) and intensive (hours of work if employed) margins of work, as well as changes in wages. We look at hours conditional on work to focus on the intensive margin, for which—at least for women—the predicted effects of the EITC are different than for employment. All specifications are estimated at the individual level, with standard errors adjusted to account for non-independence among observations within the same state and over time.[23]

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[20] A recent study using this approach is Bingley and Walker (2008).

[21] For example, Berube et al. (2002) note that two-thirds of EITC recipients use a tax preparer and hence likely do not know the details of the EITC, Leigh (2005) notes that low education and low language skills among many eligibles likely contribute to poor information, and Rothstein (2008) concludes that individuals respond to changes in average rather than marginal tax rates induced by variation in the EITC. In addition, it is undoubtedly difficult for individuals to predict how their particular labor supply choices during the year will affect their EITC payments, given that most EITC recipients take their full credit for the previous year when they file their taxes.

[22] Note that we focus on earnings and not income. Although it is possible to measure other sources of pre-tax income in the CPS data we use, there is no information on EITC payments received or taxes paid. In addition, we are more interested in how the EITC affects labor market incentives and hence earnings, while recognizing that this means that in some cases we understate the gains (or overstate the losses) from the EITC.

[23] Specifically, each observation comes from a particular state and year. However, we cluster the data at the state

We begin by focusing on the effects of the EITC. When we study women, we estimate models for employment, hours, and earnings, as well as whether families' earnings are above or below the poverty line (or other thresholds). The strongest prediction is for employment, which theory says will be increased by the EITC. However, estimates of the effect of the EITC on overall individual earnings provide a useful summary statistic for changes along various dimensions (including wages), while family earnings are of interest because the family is typically the unit of interest in anti-poverty policy.

In particular, we estimate the following baseline model:

$$(1) \qquad Y_{ist} = \alpha + \beta_1 EITC_{st} + \beta_2 EITC_{st} \cdot Kids_{ist} + X_{ist}\lambda + G_s\mu + M_t\nu + \varepsilon_{ist},$$

where Y is the dependent variable, *EITC* is the state EITC supplement expressed in percentage terms, and *Kids* is a dummy variable indicating the presence of dependent children age 18 or under in the home (which is what is measured in the CPS). The matrix X includes main effects for the number of children, as well as a large set of controls discussed below. G_s and M_t are vectors of state and year fixed effects, included to control for other differences across states that might be correlated with policy differences, and for changes in other factors over time that are common to states (such as those generated by federal policies) but that might be correlated with the policies we study. Finally, the 'i,' 's,' and 't' subscripts denote individuals, states, and years, respectively.

Some details of this specification merit additional explanation. First, because the EITC is much more generous for families with children, we view β_2 as especially indicative of the effect of the EITC on labor market outcomes. One might interpret β_1 as the effect of the EITC on those without children. However, because the model does not include a full set of state-by-year interactions (in which case β_1 would be unidentified), we cannot be entirely sure that this parameter reflects the effects of the EITC rather than the effects of shocks specific to state and year cells that are correlated with EITC. In that sense, our estimating equation can be thought of as a difference-in-difference-in-differences estimator, in which β_2 identifies the effect of the EITC from the *differential* effect for those with and without children.

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level to compute standard errors robust to heteroscedasticity and arbitrary correlations across individuals in the same state either contemporaneously or over time (Bertrand, et al., 2004).

We also verify that the estimates of β_2 are robust to more flexible specifications that include either state-specific time trends or a full set of state-by-year interactions.

Second, X includes as controls: dummy variables for education (high school dropout, high school degree, some college, bachelor's degree or higher); dummy variables for number of children as well as the number of children under age 6 (all possible values); dummy variables for marital status (never married, married spouse present, married spouse absent, and divorced, widowed, or separated); dummy variables for black or Hispanic; age and its square; and the state unemployment rate. In addition, the model includes a full set of interactions between *Kids* and both the year dummy variables and the state dummy variables. These interactions are intended to capture changes across time in the relationship between the presence of children in the home and labor market outcomes, as well as differences across states; for example, these interactions may capture the effects of cross-state differences in welfare policies that affect the employment of women with children relative to those without children.[24] For some samples, some of these controls drop out (e.g., some of the marital status controls when we study single women).

When we study the effects of the EITC on low-skilled individuals without children (who we loosely classify as "ineligible"), an interaction with *Kids* is clearly inappropriate. Instead, we identify the effect of the EITC on this group from the difference in labor market outcomes between those with higher and lower skills. We classify individuals as having higher skills if they have at least some college and as having lower skills if they have a high school degree or less. We also estimate alternative specifications that focus instead on low-skilled blacks or Hispanics, who tend to have even lower wages and hence are likely to be more adversely affected by an outward supply shift induced by the EITC—especially, perhaps, when coupled with a higher minimum wage (in specifications discussed later). For the unskilled ineligibles, the strongest prediction is that a higher EITC reduces the wage. If the substitution effect dominates the income effect or if the decline in the wage increases the extent to which these workers are

[24] When these interactions were excluded, the results were sometimes sensitive to how we controlled for the number of children and their ages (using the highly flexible manner just described or a more restrictive specification). However, when these interactions were included, the results were very stable.

bound by the minimum wage, we might also expect declines in hours or employment. Thus, our specification becomes:

$$(2) \qquad Y_{ist} = \alpha + \beta_1 EITC_{st} + \beta_2 EITC_{st} \cdot Lowskill_{ist} + X'_{ist}\,\lambda + G_s\mu + M_t\nu + \varepsilon_{ist},$$

where the vector of controls *X'* excludes the variables related to children and includes the low-skill indicator, and β_2 captures the effect of the EITC on low-skilled individuals.[25]

After estimating the effects of the EITC, we move on to specifications that are augmented to allow for interactions between the EITC and the minimum wage. For women, we estimate models for the same outcomes, asking whether the effects of the EITC discussed above vary with the level of the minimum wage. The augmented version of equation (1) is

$$(3) \qquad \begin{aligned} Y_{ist} = {} & \alpha + \beta_1 EITC + \beta_2 EITC_{st} \cdot Kids_{ist} + \gamma_1 MW_{st} + \gamma_2 MW_{st} \cdot Kids_{ist} \\ & + \delta_1 EITC_{st} \cdot MW_{st} + \delta_2 EITC_{st} \cdot MW_{st} \cdot Kids_{ist} + X_{ist}\lambda + G_s\mu + M_t\nu + \varepsilon_{ist}, \end{aligned}$$

where *MW* is the log of the minimum wage, and δ_2 identifies how variation in the minimum wage changes the effect of the EITC on those with children relative to those without. Again, we verify the robustness of the results for the policy variables interacted with *Kids* (the coefficients β_2, γ_2, and δ_2) to the inclusion of state-specific linear trends or a full set of state-year interactions. Reflecting earlier findings indicating that the effects of minimum wages take some time to become fully apparent (Baker, et al., 1999), we view it as desirable to include both contemporaneous and lagged values of the minimum wage. However, to simplify the specification, we specify the minimum wage variable in these models as the average of the current and lagged (one year) minimum wage variable. In addition, we demean the policy variables (*EITC* and *MW*) in this specification so that the main effects of the EITC and the minimum wage that we report are effectively evaluated at the sample means and hence are comparable to those from specification (1).

For individuals without children at home, the higher minimum wage may offset the reduction in wages caused by the general equilibrium effects of the EITC, but this would lead us to expect larger

[25] An alternative approach would be to estimate this model with female labor supply measures on the right-hand side, and instrument for them with variation in the EITC. In this context, equation (2) can be interpreted as a reduced-form specification for wages and other labor market outcomes.

declines in hours or employment. Thus, for these individuals we estimate models for employment, hours, wages, and earnings (as a summary measure) using an augmented version of equation (2) that allows for the possibility of interactions between the minimum wage and the EITC:

$$(4) \quad \begin{aligned} Y_{ist} = {} & \alpha + \beta_1 EITC + \beta_2 EITC_{st} \cdot Lowskill_{ist} + \gamma_1 MW_{st} + \gamma_2 MW_{st} \cdot Lowskill_{ist} \\ & + \delta_1 EITC_{st} \cdot MW_{st} + \delta_2 EITC_{st} \cdot MW_{st} \cdot Lowskill_{ist} + X'_{ist}\lambda + G_s\mu + M_t\nu + \varepsilon_{ist}. \end{aligned}$$

In this specification, δ_2 identifies how variation in the minimum wage alters the effect of the EITC on low-skilled childless individuals relative to high-skilled childless individuals.[26]

V. Results

Descriptive Statistics

Tables 1A-1C report descriptive statistics of key variables at the individual and family levels, including those for the outcomes we study. The tables cover the period 1997-2006 and present statistics for a variety of groups included in our analysis, including single and married women between the ages of 18 and 45 (Table 1A), childless individuals between the ages of 18 and 35 (Table 1B), and families with a head between the ages of 18 and 45 (Table 1C).[27] As indicated in the top panel of Table 1A, about 45% of single women (which includes women who have never married as well as those who are divorced, widowed, or separated) have at least one child at home, and 22% have more than one child. These percentages are somewhat higher for less-educated or minority single women, although still lower than the percentages for less-educated married women. Single women are also more likely to be black than less-educated married women in this age range, while the average age in each category is just under 30. With regard to education, shown in the next panel, single black or Hispanic women are somewhat less likely to have completed high school than single white women (and are labeled high school dropouts,

[26] Note that a higher EITC should reduce wages of the less-skilled whether or not they have children. But the predicted labor supply effects are different for the childless.

[27] Table 1C also includes unrelated individuals (including unrelated subfamilies) living in others' households or primary individuals in their own households. Together, these three types of families are used by the Census Bureau in measuring poverty at the family level. (See http://pubdb3.census.gov/macro/032007/pov/povnotes.htm, viewed July 15, 2008.)

although some of them may complete high school later), and are somewhat less likely to have a college degree.[28]

Average economic outcomes for these groups of women are shown in the remaining panels. For the sample of single women as a whole, the average employment rate is 79% and is higher for women without children than for women with children. Among employed single women, total hours average 1,633 hours per year, and log earnings average 7.53. Both of these figures are again higher for childless women than for women with children. Looking across the columns, less-educated and minority women have lower employment rates and lower earnings than single women overall, although employed minority women work more slightly more hours. On the other hand, less-educated married women without children are more likely to be employed, work somewhat more hours, and have higher earnings than less-educated or minority single women without children.

Table 1B presents summary statistics for childless men and women and for several subsets of this group. In particular, we compare economic outcomes for three less-educated groups—all those with at most a high school degree, then just low-skilled minorities, and then low-skilled minority single men—to each other and to those with some college or higher. Average economic outcomes are worse for the less-educated groups, with lower employment rates, hours, wages, and earnings. In addition, employment rates, wages, and earnings are lower for less-educated minorities than for the sample of less-educated individuals as a whole.

Table 1C presents summary statistics at the family level. About 46% of families (which includes unrelated individuals) are headed by a woman, while 45% of families consist of married couples. Within the group of families headed by single women, 42% have children at home. About 22% of the sample of single women family heads is black and 13% is Hispanic; the percentage black is noticeably higher than for all families, while the percentage Hispanic is slightly lower. Among single women family heads, 54% have completed at most a high school education, while 13% have not completed high school; these

[28] The education classifications are based on education attained and whether the person reports a high school diploma or GED. We do not distinguish between the latter two cases, although there is evidence suggesting that this distinction is important for employment outcomes (e.g., Cameron and Heckman, 1993). Separate information on diploma and GED holders is first available in the CPS in 1998.

percentages are not much different than for the sample of family heads as a whole. In contrast, the economic outcomes differ noticeably across family types. About 20% of families with heads between the ages of 18 and 45 had earnings below the poverty line, and about 13% had earnings less than ½ the poverty line (sometimes referred to as "extreme poverty"). However, the percentages with low levels of earnings rise sharply for families headed by single women, and even more so for families headed by less-educated or minority women. Moreover, the differences are especially large for female-headed families with children: 55% of families headed by a less-educated or minority woman had earnings below the poverty line and more than one-third had earnings below ½ the poverty line.

The policy variables are shown in Figures 3 through 6. As indicated in Figure 3, the prevalence of state minimum wages and state EITC supplements increased over our sample period. The percentage of families residing in states with an EITC rose from 17% in 1997 to 32% in 2006, while the percentage of families in states with a minimum wage higher than the federal level rose from 18% in 1998 to about 50% in 2006, with especially sharp increases in 2005 and 2006. In addition, state EITCs and state minimum wages have become more generous over time. For example, the average size of the supplement in states with an EITC rose from 8% in 1997 to more than 15% in 2006 (Figure 4),[29] while the level of the minimum wage in states where the minimum was above the federal level moved up from just over $5 per hour in 1997 to about $6.50 per hour in 2006 (Figure 5); in contrast, the federal hourly minimum wage was raised to $5.15 in late 1997 and was held at that level through 2006.

Figure 6 presents a scatter plot of state minimum wages and EITC supplements in 2006. As indicated by the upward-sloping regression line, states with higher minimum wages tended to have a more generous EITC supplement. However, the dispersion of points around the line is considerable, suggesting that states varied considerably in their use of these policies. In particular, some states implemented high minimum wages but low (or no) EITC supplements, and others had high EITC supplements but low

[29] Over 80% of the observations on families in states that supplement the EITC were from states with a refundable EITC, and in almost all cases the EITC was fully refundable.

minimum wages. We use this variation to identify how the interaction of state minimum wages and state EITC supplements influenced economic outcomes at the individual and family level.

Effects of the EITC on Employment, Hours, and Earnings

We begin with regression estimates of the effects of the EITC on employment, hours, and earnings. Table 2 reports results for various groups of women expected to be differentially affected by the EITC (estimates of equation (1)). Column (1) reports the relevant coefficient estimates for a sample that includes all single women between the ages of 18 and 45. As indicated in the second row in each panel, the coefficient on the EITC variable itself is generally small and insignificant, suggesting that the EITC has negligible effects on labor market outcomes for single women without children. More important, the coefficient on the EITC-kids interaction (the first row) indicates that the EITC has a positive and significant (at the 10% level) effect on the employment and earnings of single women with children. The 0.18 estimate for employment implies that a 10% EITC supplement boosts the probability of employment among single mothers by 1.8 percentage points relative to single women without children, while the 1.80 estimate for earnings implies that a 10% supplement raises their earnings by 18%. These results are generally consistent with previous research on the EITC (e.g., Hoffman and Seidman, 2003) indicating that the EITC boosts employment and earnings of single mothers.

The next two columns narrow the sample to two groups that are often considered likely to be more strongly influenced by the EITC—less-educated women and minority women. These individuals are likely to reap the most from the EITC because their earnings are low and thus less likely to be in the plateau or phase-out range where the EITC can generate incentives to work less. Consistent with these priors, the coefficient on the EITC-kids interaction is positive for employment and earnings and larger in each case than for the broader sample of single women. Although the standard errors also become larger, the estimated effects are statistically significant at the 5% or 10% level for less-educated women. In contrast, the hours effects (conditional on employment) are small and statistically insignificant.

Finally, the last column reports results for less-educated married women. For many in this group, family earnings are above the maximum EITC income threshold and at a level where we would not

expect the EITC to have an effect on their labor market outcomes. However, there may be others who are in the plateau or phase-out range where the EITC is predicted to reduce hours worked (and perhaps employment). The results are generally consistent with this expectation, pointing to negative effects of the EITC on employment, hours, and earnings for married women with children, although none of the estimates are statistically significant. Clearly, though, the results are substantially different from those for single women, confirming what theory would lead us to expect, and hence bolstering a causal interpretation of the estimates for single women.[30]

A potential side effect of the EITC is that the positive supply response for eligible mothers may lead to negative spillover effects on other less-skilled individuals who are ineligible for the EITC but who compete for jobs with the new labor force entrants. Table 3A presents results for different groups of such individuals (estimates of equation (2)). In this specification, we identify the effect of the EITC from an interaction between the EITC supplement and an indicator for low skills, which we define as having at most a high-school degree. To focus in on those individuals more likely to be substitutes in production for women benefiting from the EITC, we limit the sample to men and women between the ages of 18 and 35. We first estimate the model for all individuals in this age range. We then restrict the treatment group to less-skilled minorities, and finally to less-skilled minority single men (keeping the control group the same). This last treatment group is of interest for at least two reasons. First, single men may be less skilled or less productive than otherwise comparable married men (e.g., Korenman and Neumark, 1991). And second, single, less-skilled, and especially minorities, have been the focus of policy proposals regarding extensions of the EITC (e.g., Gitterman et al., 2007).

The first column of the table presents the effects of the EITC on the wages, employment, hours (conditional), and earnings of less-educated men and women without children at home. The estimates always indicate negative effects of the EITC, although only the estimated effect on hours (conditional on employment) is statistically significant. For less-educated blacks and Hispanics, reported in column (2),

[30] These findings parallel those in Eissa and Hoynes (2004), although Eissa and Hoynes sometimes find statistically stronger evidence that the EITC reduces labor market participation of less-educated married women.

the results are sharper and somewhat different. In particular, the estimated effects of the EITC on employment and earnings are negative and statistically significant, and the point estimates are larger than in column (1), implying that this group is more adversely affected by the EITC. There is no evidence of an effect on hours conditional on employment, while the estimated negative effect on wages is at best marginally significant. Finally, as indicated in column (3), the results for less-educated single minority men are similar to and stronger than those in column (2), with the estimates pointing to negative effects of the EITC on wages, employment, and earnings.[31]

Table 3B presents some additional evidence on spillover effects from the EITC to childless, less-skilled individuals.[32] In particular, we might expect the spillover effects to be stronger in labor markets where more women enter the labor force in response to a more generous EITC. In Table 3A, differences in spillovers across labor markets are assumed to be related to variation in the size of the EITC supplement. However, the supply response is also a function of how many women are eligible for the EITC. We measure the proportion of women likely to be eligible for the EITC in two ways. Our first measure is the percentage of tax returns in each state that claimed the federal EITC.[33] Our second measure is the estimated share of single mothers in the state. Although neither measure directly corresponds to the share of EITC-eligible women, both should be highly correlated with that share.

We augment equation (2) to include an interaction between the EITC effect for the low-skilled and these shares. To avoid endogeneity stemming from the fact that the childless can file for the EITC, or

[31] We also estimated similar models for the low-skilled only, dropping the interactions in equation (2). In this case, the estimates did not reflect the predicted negative wage or employment effects (with all of the estimates near zero and statistically insignificant), suggesting that using the high-skilled group captures other economic shocks across states and years. (Similarly, the same thing occurred if we included interactions between the low-skill indicator and state and year effects.) We do note, however, that Leigh (2007) reports wage regression estimates for the low-skilled only that are consistent with the predicted negative effects of the EITC on the unskilled, although the sample period and specification differ in other ways. Rothstein (2008) explores this issue more fully in the context of federal increases in the EITC in the 1990s, noting the importance of controlling for demand shifts to detect the adverse effects of the EITC on wages.

[32] We are grateful to Jim Poterba for suggesting this analysis.

[33] These data are derived from the Internal Revenue Service's Stakeholder Partnerships, Education, and Communication (IRS-SPEC) database. We are grateful to Elizabeth Kneebone from the Brookings Metropolitan Policy Program for providing us with the state tabulations.

from an EITC effect on household structure, we drop our first sample year (1997) from the analysis, and use the share in 1997.[34] Thus, the specification we estimate is:

$$(2') \quad \begin{aligned} Y_{ist} &= \alpha + \beta_1 EITC_{st} + \beta_2 EITC_{st} \cdot Lowskill_{ist} + \beta_3 EITC_{st} \cdot Lowskill_{ist} \cdot Share97_s \\ &+ \beta_4 EITC_{st} \cdot Share97_s + \beta_5 Lowskill_{ist} \cdot Share97_s + X'_{ist}\lambda + G_s\mu + M_t\nu + \varepsilon_{ist}, \end{aligned}$$

where *Share97* is one of our measures of EITC eligibility. Note that the main effects of this share are capture by the state dummy variables. The parameter of most interest is β_3.

Estimates for the sample of 18-35 year-old childless individuals are reported in Table 3B. The results indicate that the spillover effects of the EITC on low-skilled, childless individuals are larger in states where a greater proportion of women are potentially affected by the EITC. In the wage regression estimates shown in column (1), for example, the estimated coefficient of the interaction between the EITC variable, the low-skill indicator, and the share of EITC filers is negative and significant, implying that the negative effect of the EITC on the wages of childless, low-skilled men and women is stronger in states where a higher percentage of tax filers claimed the EITC. Similar statistically significant negative interactions are evident in the regressions for employment and earnings. As indicated in column (2), we also find evidence of negative interactions using the proportion of single mothers in the state as the share variable.[35] The evidence that the effects of the EITC are more adverse when a larger share of the population is potentially affected by the EITC strengthens the conclusion that we are detecting spillover effects of the EITC.

In Table 4, we turn to the effects of the EITC on the total earnings of families with heads between the ages of 18 and 45, which provides a way of aggregating the effects for men and women shown in the previous tables. Because we are interested in how the EITC influences the lower tail of the earnings distribution, we focus on two metrics that are illustrative of these effects: the probability that a family's

[34] The mean filing share across states in 1997 is 0.16, ranging from 0.09 in Alaska to 0.32 in Mississippi. The mean share of the adult population that consists of single mothers (with children at home) is 0.07, ranging from 0.05 in Maine to 0.10 in Mississippi.

[35] We also estimated these models for the other subsamples considered in Table 3A. The qualitative conclusions based on the point estimates were fairly similar, with one exception. In particular, for low-skilled minorities, the point estimates did not suggest that a higher share filing or a higher share of single mothers is associated with sharper negative effects of the EITC on wages. This may reflect the lower wages of minorities, implying that more of them are bound by the minimum wage so that the wage cannot decline as much in response to the labor supply increases induced by the EITC.

earnings are below the level of income associated with the poverty line, and the probability that family earnings are below ½ the poverty line. As indicated in the first column, for the sample of all families, the EITC appears to be associated with reductions in the proportion of families with very low earnings. However, the estimated coefficients of the EITC-kids interactions are relatively small and not statistically significant. The results are somewhat stronger when the sample is restricted to families headed by single females (column (2)), or to families headed by less-educated single females (column (3)); in these cases, the estimated coefficient of the EITC-kids interaction is significant at the 10% level for the probability that families are below ½ of the poverty line. For families headed by minority single women, the evidence is weaker. Overall, however, the evidence is in the direction of previous research findings that the EITC is effective at boosting the earnings of very poor families.

Interactions between the EITC and the Minimum Wage

We next turn to evidence on our central question regarding the effects of interactions between the EITC and minimum wages. As in Tables 2-4, we focus on the three main groups likely to be affected by the EITC. As noted earlier, for women who are eligible for the EITC, the disemployment effects of a higher minimum wage could reduce the positive employment effect of the EITC. Alternatively, the interaction for these women could be positive, because a higher minimum wage makes the EITC more valuable for eligible families. In contrast, for groups not likely to be eligible for the EITC, or eligible for only a small credit, a high minimum wage coupled with an EITC could be a particularly bad combination, with the minimum wage reducing their employment prospects via the higher wage floor imposed on employers, and the EITC reducing their employment prospects via the increased supply of eligible women entering the labor market. For single women and families, this latter effect pertains to childless women and thus would be captured by the coefficient on the EITC-minimum wage interaction. For childless low-skilled individuals, this latter effect pertains to the triple interaction between the EITC, the minimum wage, and the low-skill indicator.

Table 5 reports results for employment and log earnings of single women. As shown in the first column of the top panel, the EITC effect on employment is positive and significant for single women with

children, similar to the results we reported in Table 2. Moreover, the coefficient on the interaction term between the minimum wage, the EITC, and children is positive and significant, indicating that a higher minimum wage amplifies the positive labor supply response of the EITC for single mothers. The results are even stronger for less-educated and minority mothers (columns (2) and (3)). In contrast, for single women without children, the coefficient on the EITC-minimum wage interaction is negative, and notably so for minorities and less-educated women, albeit not statistically significant.

The effects on earnings are shown in the bottom panel. Consistent with the positive effects on employment, both the EITC variable and the EITC-minimum wage interaction have a positive and significant effect on the earnings of women with children, with larger effects evident for the samples restricted to minorities or less-educated women than for the sample as a whole. This suggests that the combination of an EITC and a higher minimum wage may be especially powerful in raising the earnings of low-skilled single mothers. However, these specifications also suggest that the positive labor supply response of single mothers eligible for the EITC may reduce earnings and employment opportunities for other subsets of the population. In particular, the results in this table indicate that the combination of an EITC and a high minimum wage reduces employment and earnings among single women without children, especially for minority women. Below, after presenting some additional analyses on these spillover effects, we provide some calculations that provide a better sense of how to interpret the coefficient magnitudes in Table 5.

Table 6 reports results for unskilled childless individuals. In principle, a higher minimum wage coupled with an EITC could cut in different ways for this group of individuals. On the one hand, a high minimum wage that leads to more labor market entry among women eligible for the EITC could put additional downward pressure on wages for those earning more than the minimum wage. On the other hand, a high minimum wage could create a floor below which wages cannot fall despite the increased labor supply of women, in which case the combined policies might reduce employment more strongly.

As shown in Table 6, the evidence is more consistent with the latter type of effect.[36] The effects of the EITC on wages (shown in the top panel) are negative, but there is no evidence that this adverse effect is compounded by a higher minimum wage, as the estimated interactive coefficients for low-skilled childless individuals are positive and insignificant.[37] In contrast, the point estimates of the triple interaction (MW × EITC × low-skill) for employment are all negative, and larger and statistically significant when we focus on minorities and single males (in columns (2) and (3)). Coupled with the negative effects of the EITC on employment of the less-skilled (in the first row of the middle panel), these results imply that a higher minimum wage exacerbates the negative impact of the EITC. Finally, as indicated in the lower panel, the presence of either an EITC or a minimum wage tends to reduce the relative earnings of the low-skilled, and these effects are heightened when both policies are in effect—with a statistically significant interaction evident for blacks or Hispanics and the narrower subgroup of minority single males.

Teenagers are another group for which the combination of a high minimum wage and an EITC may produce adverse effects. Previous researchers have found evidence of substitutability between women and youth (e.g., Grant and Hamermesh, 1981), raising the possibility than an EITC-induced outward supply shift for women with children may depress labor market opportunities for teenagers. As for other groups, this substitutability could lead to downward pressure on wages or reduced employment.

To investigate this possibility, we estimate models for 16-19 year-old males and for 16-19 year-old females that, similarly to those presented above, allow for interactions between the EITC and minimum wages. Because limiting the sample to teenagers substantially reduces the number of observations in the ADF dataset, we switch to the CPS monthly ORG files for this part of the analysis. This requires some differences in specification from the annual regressions shown in previous tables in that we create a monthly minimum wage variable that captures the exact timing of minimum wage

[36] We do not report hours effects since there was little evidence of EITC effects on hours (conditional on employment) in Table 3.

[37] This finding appears consistent with the only other instance we are aware of in which research has explored the effects of minimum wage-EITC interactions. In particular, in his analysis of how the EITC affects wages of low-skilled workers, Leigh (2007) notes that he estimated models with minimum wage-EITC interactions and found that a higher minimum wage did little to influence the effects of the EITC.

changes,[38] and we include a set of dummy variables for calendar year and month and a set of state-specific time trends. In addition, reflecting the time period covered by the regularly monthly CPS surveys, our analysis is limited to employment, wages, and earnings, all of which refer to a one-week period during the survey month. The sample period for these regressions extends from January 1997 to December 2007.

The results for teenage males are presented in Table 7A, while those for females are shown in Table 7B; we show results separately for all races, all non-black, non-Hispanic individuals, and blacks or Hispanics. Because previous analyses of the youth labor market have often focused solely on the effects of minimum wages and because teenagers are not generally eligible for the EITC, the first column in each pair shows the coefficients from a standard regression of employment, wages, or earnings on the minimum wage; the second column in each set then adds in an EITC variable and the EITC-minimum wage interaction.[39] In the standard regression for male teenagers (Table 7A), the minimum wage has a negative effect on the employment rate of all teenage males, a positive effect on wages, and a negative effect on weekly earnings, consistent with much earlier research.[40] And, as can be seen in columns (3) and (5), the minimum wage has more adverse effects on blacks and Hispanics than on whites. Adding in variables for the EITC and EITC-minimum wage interaction provides weak evidence that the combination of a high EITC and high minimum wage leads to a larger loss of earnings for male teens, mainly by reducing their employment opportunities.[41] However, most of the key coefficients in this specification are not statistically significant.

Clearer evidence of substitutability between low-skilled adult women and teenagers can be seen in the regressions for female teenagers (Table 7B). For the minimum wage variable alone, the patterns are broadly similar to those seen for male teens, with reductions in employment rates and earnings, but

[38] The EITC supplements refer to an entire tax year, and thus have the same value in every month within the year.
[39] Consistent with our analysis using the ADF dataset, the minimum wage is defined as the average (in logs) of the current minimum wage and the minimum wage lagged one year (i.e. twelve months).
[40] See Neumark and Wascher (forthcoming).
[41] In interpreting the magnitudes of the coefficients on the interactions, keep in mind that the EITC variable is in the 0.05 to 0.35 range, and the minimum wage is in logs. Thus, for example, the interactive effect of a 10% increase in the minimum wage and a 0.1 increase in the EITC supplement is 0.01 times the interactive coefficient.

increases in wages for those who remained employed. However, the second specification shows large negative coefficients on the interaction terms in every case, with most of them statistically significant. Evidently, the additional increase in labor supply among adult women in response to the combination of a high minimum wage and generous EITC leads to noticeable reductions in both the employment rates and wages of female teenagers, thereby reducing their earnings sharply. This suggests that the types of jobs taken by low-skilled adult women drawn into the workforce by the EITC are similar to those typically filled by teenage women.

In Table 8, we ask how minimum wages influence the effects of the EITC on family earnings relative to the poverty line or ½ the poverty line. Consistent with the results we presented above, we find that the EITC, by itself, tends to reduce the likelihood that families are poor, and even more so below ½ of the poverty line. However, the interaction effects are particularly striking. Most important, the combination of an EITC and a higher minimum wage tends to have a strong beneficial effect on the earnings of families with children, especially for those headed by single women, who, as we have seen, increase their participation in the labor market in response to this set of policies. In contrast, to the extent that we are willing to interpret the "main" EITC-minimum wage interaction as causal, the positive estimated coefficient of this interaction suggests that the added inflow of single mothers stemming from a high EITC/ high minimum wage policy tends to reduce earnings (and hence depress family earnings) for other low-skilled individuals; note that this latter effect is larger when we focus on less-educated single females, but not when we focus on minority women.

To help interpret the coefficient estimates, Tables 9-11 present implied effects of various policy combinations on a subset of the labor market outcomes we considered in the previous tables; here we focus on the groups and outcomes for which we found the strongest evidence of effects of the EITC. For example, in the first column of Table 9, we show the effect of introducing a 10% state EITC supplement on the employment status of single women under three different values of the minimum wage—a wage floor set at the sample mean, a minimum wage set 10% above the sample mean, and a minimum wage set 25% above the sample mean. As indicated in the top panel, introducing a 10% EITC supplement in a

state where the minimum wage is set to the sample average increases employment among single women with children but has little effect on the employment of childless women. With a higher minimum wage, the effects of the EITC on the employment of single mothers become more strongly positive, while the effects on the employment of single women without children are essentially unchanged. The difference in the responses of women with and without children to the EITC is statistically significant in all cases, as is the change in the relative response of women with children when the minimum wage is raised. Thus, these comparisons clearly indicate that the EITC and the minimum wage interact in a way that induces a larger absolute and relative labor supply response among women with children when the minimum wage is high.

The remaining two columns show corresponding effects for low-skilled and minority single women. The results are slightly stronger for these two groups, with a larger positive labor supply response for single women with children, especially among minorities. In addition, the effect of the EITC on less-skilled or minority women without children becomes negative at higher levels of the minimum wage, although these estimates are not statistically significant. In any event, the differences in the interactions between the EITC and the minimum wage for single women with and without children are significantly different for all three samples, suggesting that a higher minimum wage boosts the positive effects of the EITC on the employment of women with children who are relatively more likely to be eligible for generous EITC payments.

In Table 10, we present the implied effects of a similar range of policy combinations on the earnings of childless individuals. In this case, we differentiate between the effects of policy on the earnings of lower-skilled/minority and higher-skilled individuals. As indicated in the top panel, the combination of a 10% EITC supplement and a minimum wage set at its sample mean leads to a small loss in earnings among the low-skilled, although the effect is only significant for the estimates in columns (2) and (3). However, the difference between the effects on low-skilled vs. high-skilled individuals indicates more strongly that the EITC reduces the *relative* earnings of low-skilled childless individuals; moreover, this relative earnings effect is negative for low-skilled childless individuals at each value of the minimum

wage shown in the table, and is statistically significant for the two estimates for low-skilled minorities.[42] In addition, a higher minimum wage strengthens the negative EITC earnings effects for the less-skilled, both absolutely, and relative to higher-skilled childless individuals. The evidence for the interaction effect on earnings of low-skilled vs. high-skilled childless minorities is statistically significant at the 5% level for men and women combined, as well as for single men; in general, it is these relative effects on which we focus in this paper, given that the estimated "effects" for the high-skilled control group may reflect other influences correlated with the policy variation we study.

Table 11 shows the effects of these various policy combinations on family earnings relative to the two poverty thresholds we considered. As suggested by the results in Table 8, the top panel of Table 11 indicates that a 10% EITC implemented at the average value of the minimum wage tends to reduce the incidence of poverty among families with children (and relative to childless families). These beneficial effects are especially pronounced for families headed by a single female, and the difference between the effects for single mothers and single women without children is statistically significant for the proportions with earnings less than ½ the poverty line (column (4)). Moreover, at higher levels of the minimum wage, these beneficial effects become noticeably larger. As indicated in column (4), for example, a 10% EITC supplement reduces the proportion of single mothers with earnings below ½ the poverty line by 0.0309 at an average level of the minimum wage, and by 0.0491 with a minimum wage 25% above the average. The difference in these effects (−0.0182) is statistically significant. In contrast, the estimates suggest that a combination of a higher minimum wage and a generous EITC supplement tends to increase the proportion of childless families with earnings below the poverty line. Our strongest conclusion from

[42] To clarify this calculation, in the top three rows of Table 10, the estimate shown for "Low-skill" is the sum of the (EITC × low-skill) and EITC coefficient estimates in the bottom panel of Table 6, multiplied by 0.1; the estimate shown for "High-skill" is the EITC coefficient estimate from that same panel of Table 6, also multiplied by 0.1; and the estimate shown for "Difference" is the difference between the low-skill and high-skill estimates. When these are evaluated at a higher minimum wage, the corresponding coefficients for the EITC-minimum wage interactions multiplied by the minimum wage increase are added. Thus, for example, the 0.030 estimate for "High-skill" in the second panel of column (1) is calculated by adding the 0.50 coefficient estimate on EITC in column (1) of the bottom panel of Table 6 to −2.01× 0.1 (the coefficient on MW × EITC multiplied by the increase in the minimum wage), and then multiplying this sum by 0.1 (the size of the EITC supplement).

the estimates in Table 11, however, is that a higher minimum wage does appear to increase the likelihood that the EITC lifts families with children out of extreme poverty.

Finally, we assessed the robustness of our conclusions on EITC-minimum wage interactions in two other ways not described in the tables. First, to check whether the estimated interactions were simply picking up omitted nonlinearities in the main policy effects, we re-estimated the specifications adding quadratic terms in all of the policy variables except for the EITC-minimum wage interactions (including, in equation (3), for example, the main policy effects as well as their interaction with the dummy variable for children in the home). The estimated EITC-minimum wage interactions were very similar, and the evidence was in some cases statistically stronger. Second, to check whether our identification was coming from the linear restrictions on the main and interactive effects, we created four indicators for each policy, with the first designating state/years for which no policy (or in the case of the minimum wage, a minimal policy) was in effect and the latter three designating state/years with low, medium, and high versions of the policy (roughly the eighth, ninth, and tenth deciles, where the variation in policy occurs). We then estimated models with the full set of indicators and interactions corresponding to equations (3) and (4). In all cases, we still found evidence that higher minimum wages enhanced the effects of the EITC, although sometimes this evidence only emerged over particular ranges of the EITC (e.g., the minimum wage enhanced the effect of a "medium" EITC relative to no EITC).

VI. Conclusions

The expansion of the federal EITC and the implementation of EITC supplements and higher minimum wages at the state level have noticeably altered the low-wage labor market over the past 15 years. In this paper, we study how this combination of policies has influenced work incentives and labor market outcomes for various groups of low-skilled individuals, and we examine the concomitant effects on the economic well-being of families. We first develop a simple theoretical model that illustrates the ways in which minimum wages and the EITC could interact, and show that such interactions could

differentially affect various groups.[43] In particular, we show that a higher minimum wage could enhance the effect of the EITC for women by inducing particular subgroups to increase their willingness to work to a greater extent than would be caused by the EITC alone. But it is also possible for a high EITC coupled with a high minimum wage to have adverse effects, especially for low-skilled adults or teenagers who may have to compete with the women who are drawn into the labor market by a higher EITC. We then estimate models that allow for interactions between minimum wages and the EITC to assess the relevance of these possibilities.

Our results confirm earlier research indicating that the EITC is an effective means of encouraging work among less-skilled single mothers. We also find that the EITC interacts with the minimum wage in a way that amplifies the labor supply response and increase in earnings among single women with children, suggesting that the combination of an EITC and minimum wage can provide an additional boost to the incomes of such families. However, we also find that the EITC and minimum wage have adverse effects on the employment and earnings of less-skilled and minority individuals without children in the home, suggesting that the benefits afforded to single women come at a cost, with minimum wages exacerbating the potentially adverse effects of the EITC on low-skilled individuals not eligible for the EITC.

Thus, whether or not the policy combination of a high EITC and a high minimum wage is viewed as favorable or unfavorable ultimately depends on whose earnings or incomes policymakers are targeting. The distributional goals of public policy typically focus more on family income than on individual income. Moreover, it seems fair to say that policymakers have been most concerned with increasing resources for families with children, via the EITC, welfare, and other policies. However, the recent policy debate has also refocused attention on those without children in the home, and in particular on the low-skilled men who, according to our estimates, are hit especially hard by a combination of a high EITC and a high minimum wage. For example, in support of an expansion in the EITC for those without

[43] We have framed this discussion in terms of how variation in the minimum wage alters the effects of the EITC, mainly because this is how the policy argument is often couched. Of course, an interaction between the two policies in a regression model can just as well be interpreted as how a higher EITC influences the effects of the minimum wage.

children, Berlin (2007) argues that policies that increase income from labor market participation for less-skilled men might reduce the relative attractiveness of illicit sources of income, as well as make such men more attractive marriage partners and thus help to reverse the declines in marriage and increases in out-of-wedlock childbearing and childrearing that have occurred in recent decades.[44] In addition, Gitterman et al. (2007) point out that many men who are non-custodial parents still have financial responsibility for their children. These arguments suggest that policymakers should not focus solely on how policies affect earnings of families with children and low-skilled or female heads.

Finally, the evidence of policy interactions between the EITC and the minimum wage indicates that research on the distributional effects of one policy in isolation may be too limited. As one example, we noted in Section II that the existing research does not find beneficial distributional effects of the minimum wage. However, this research did not consider policy interactions, and in our review of this work (Neumark and Wascher, forthcoming), we suggested that the distributional effects of minimum wages may vary with the institutional and policy setting. Indeed, the evidence that there are interactive effects between the EITC and the minimum wage points to just one of a number of possible avenues by which changes in welfare and incentives to work over the past decade in the U.S. may have altered the effects of the minimum wage. These avenues merit further study. And, of course, the question can be turned around to extend the question this paper studies, asking how other policy changes may have influenced the effectiveness of the EITC.

[44] Our estimates do not speak directly to this alternative type of EITC. At the same time, the evidence of adverse effects of the present EITC on low-skilled individuals without children also suggests that a substantially more generous EITC for those without children could pose negative tradeoffs with respect to the women whose employment and earnings are boosted by the EITC as it is currently structured.

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Figure 1: Minimum Wages and the EITC in a Competitive Labor Market

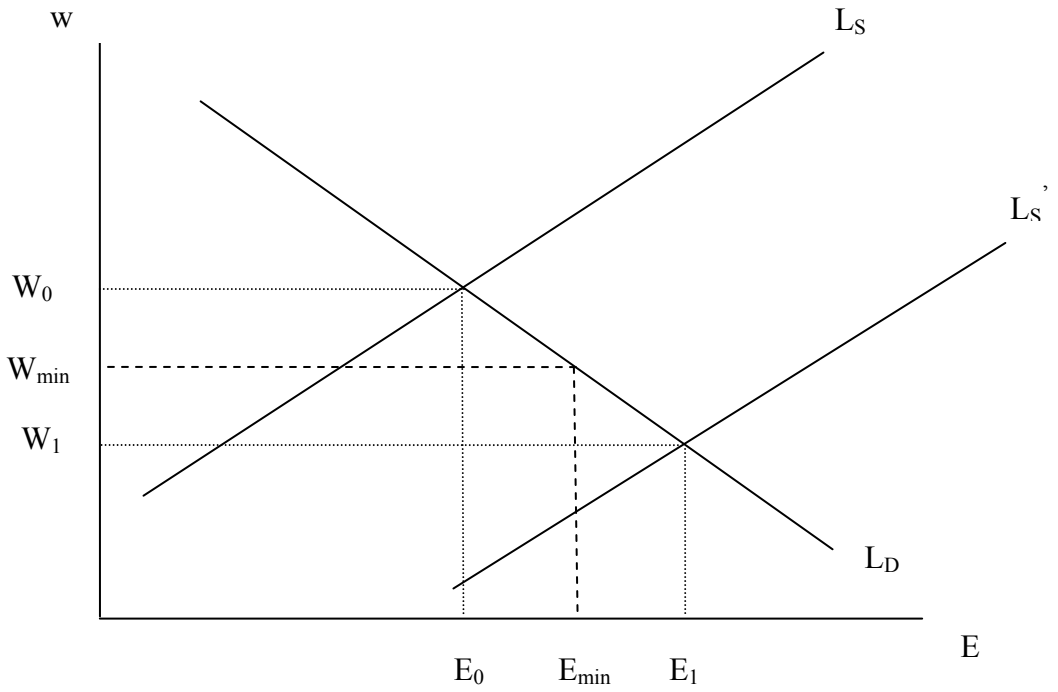


Figure 2: Minimum Wage-EITC Interactions

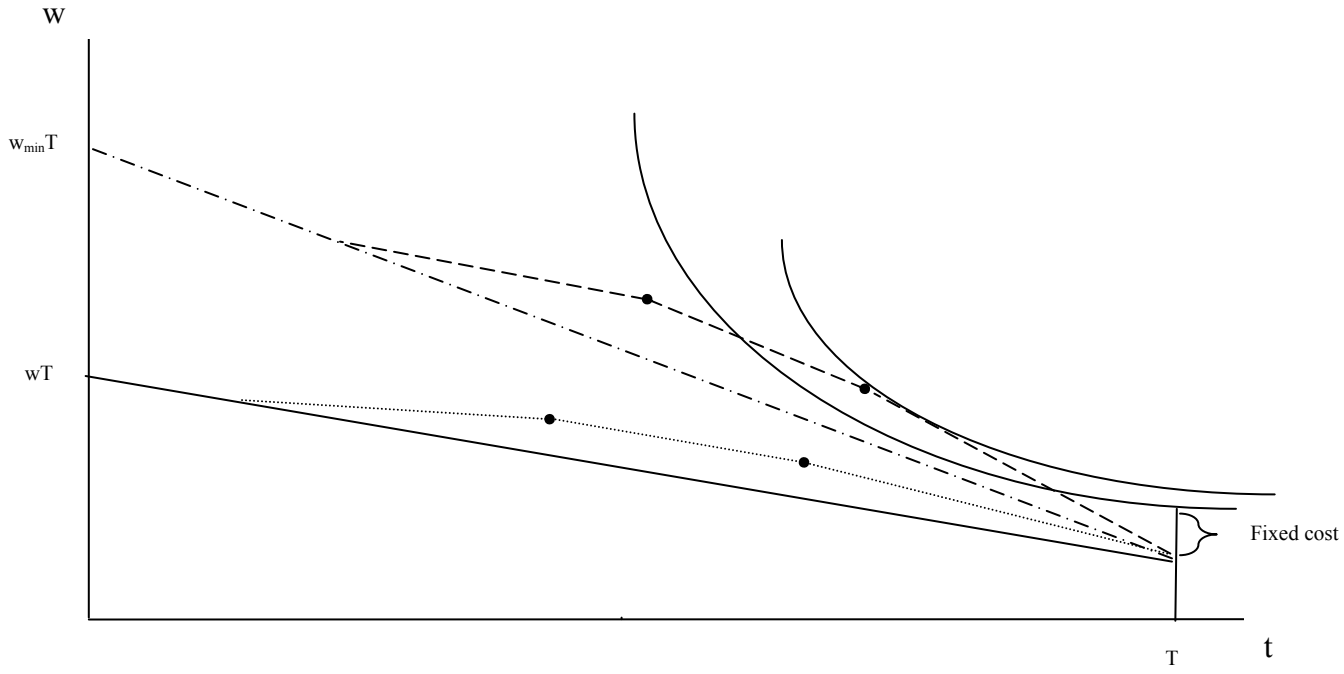


Figure 3: Changes in Shares of Families Covered by Higher State Minimum Wage or State EITC

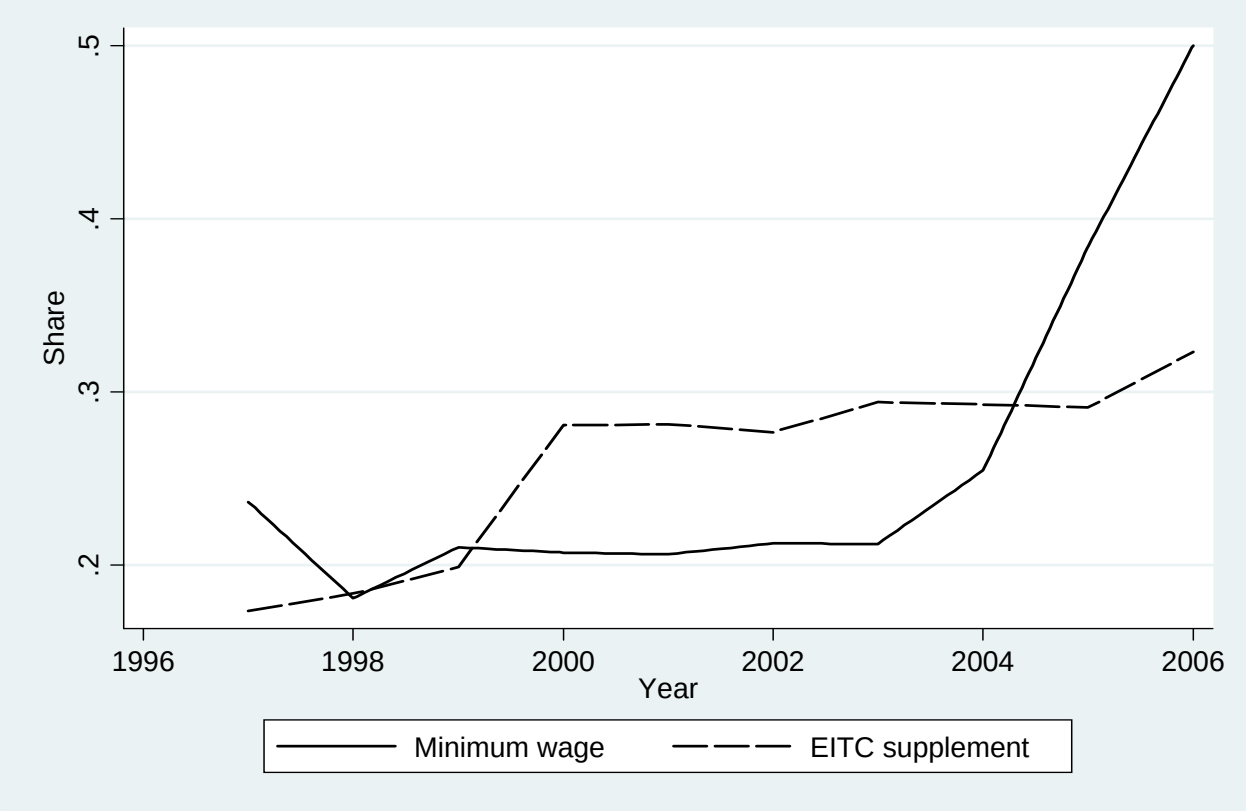


Figure 4: Average EITC Supplements Across States

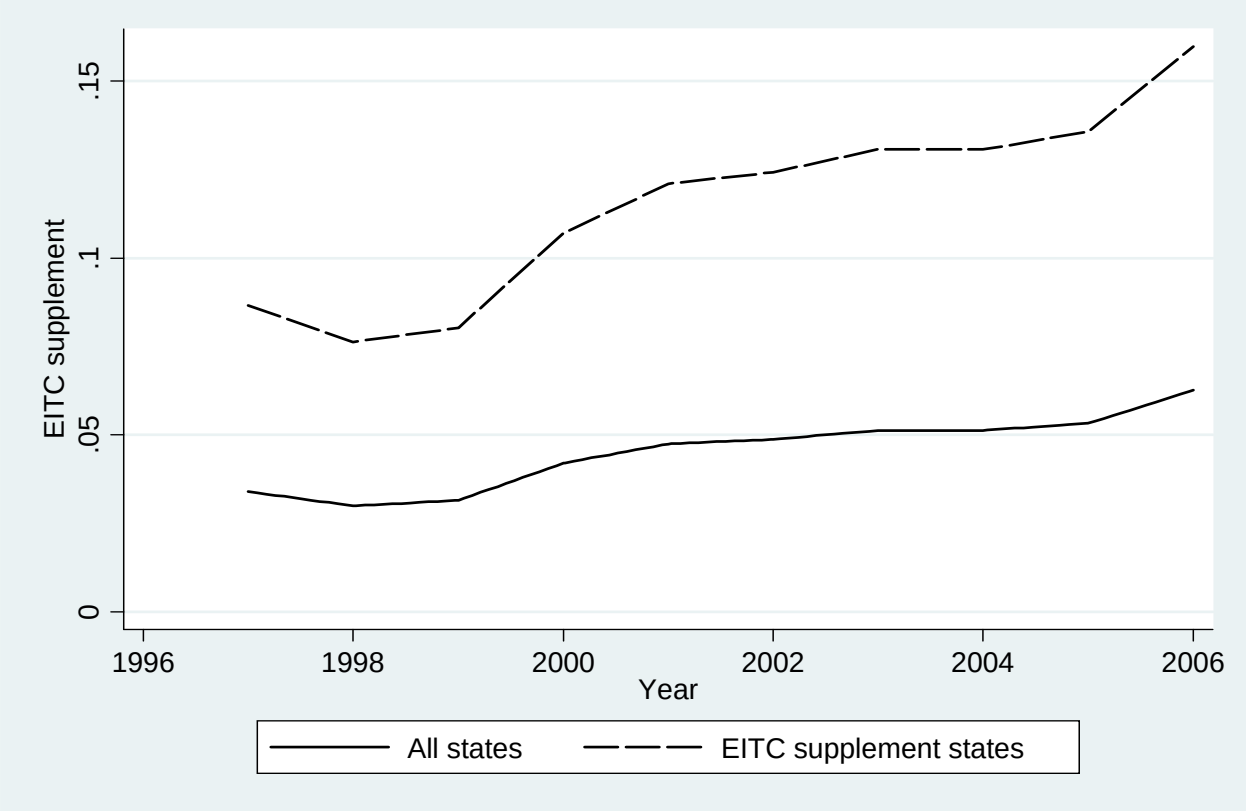


Figure 5: Average State Minimum Wages Across States

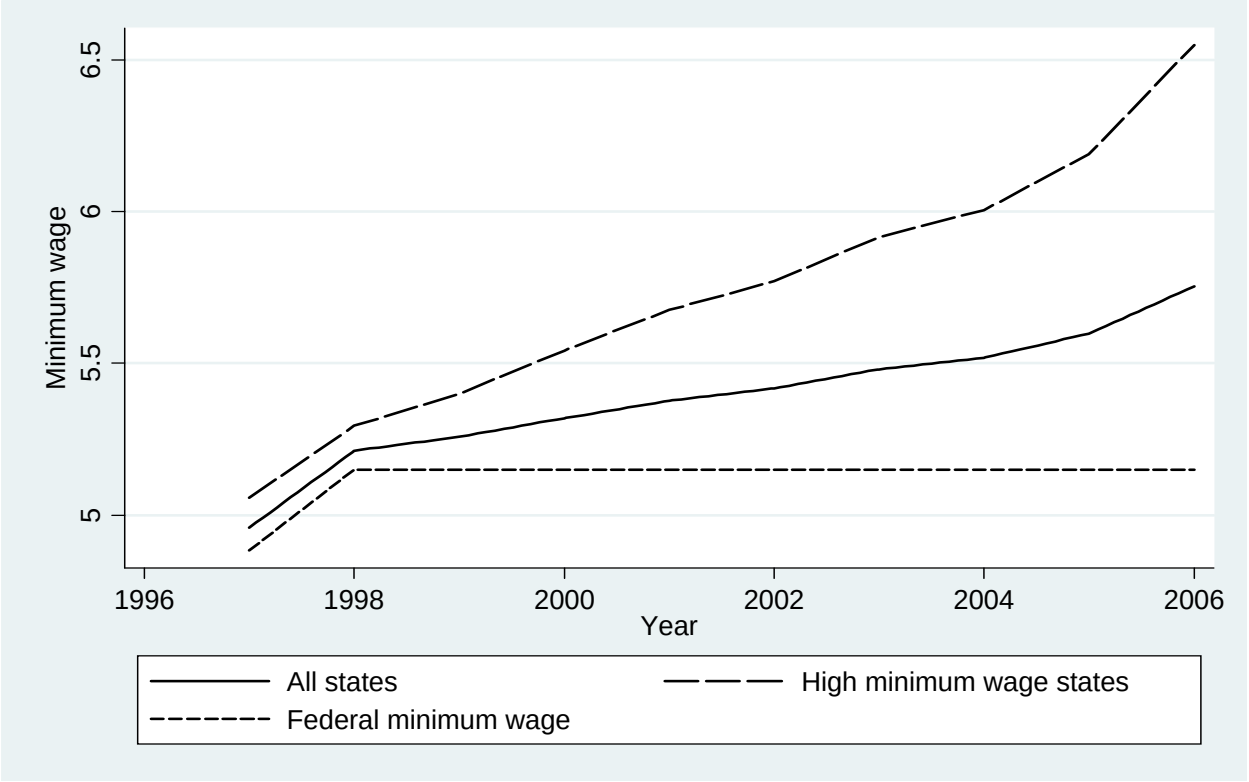
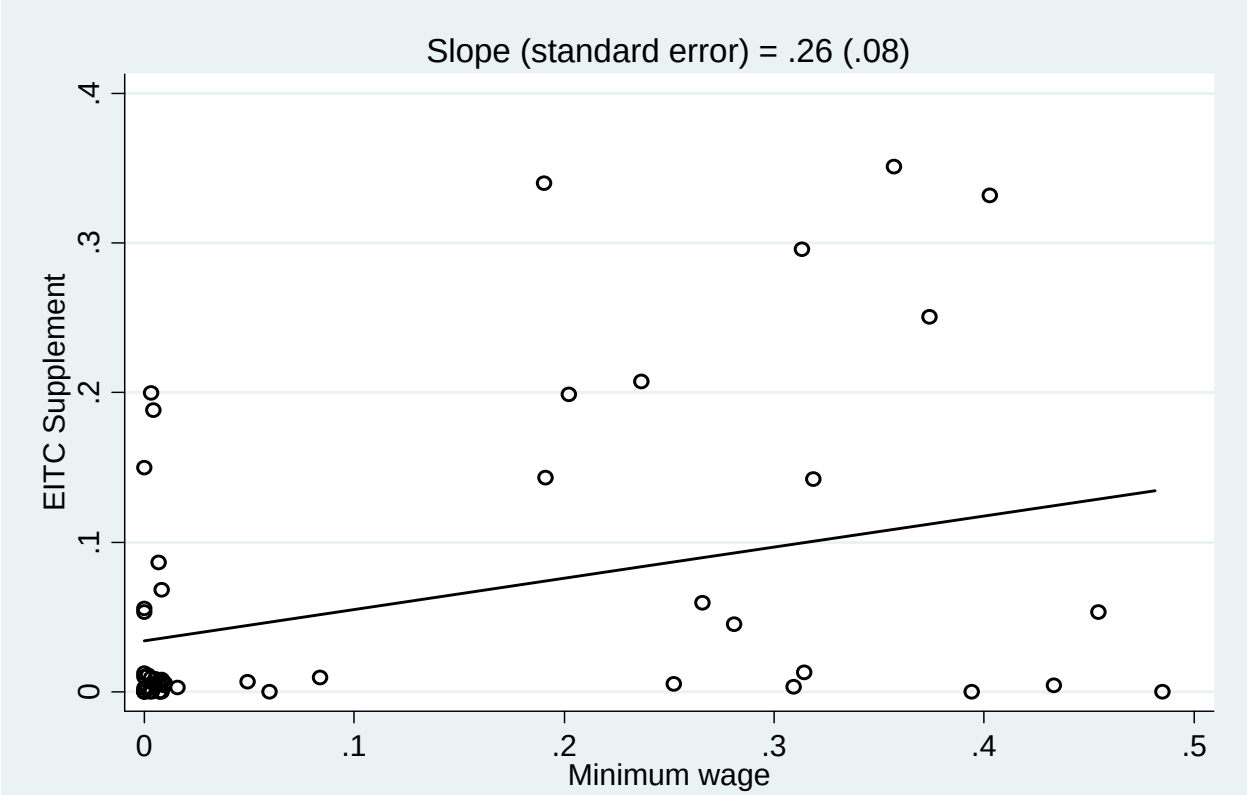


Figure 6: State Minimum Wages and State EITC Supplements, 2006



Note: State minimum wage is percent deviation from federal.

Table 1A: Descriptive Statistics for Individual Women, 1997-2006

	Single women, 18-45	Single women, 18-45, high school degree at most	Single women, 18-45, black or Hispanic	Married women, 18-45, high school degree at most
	(1)	(2)	(3)	(4)
1 child	.23	.26	.26	.26
2+ children	.22	.26	.31	.54
Black	.21	.23	.61	.09
Hispanic	.14	.16	.51	.26
Age	28.4	27.4	29.0	28.1
Highest education				
High school dropout	.16	.22	.24	.20
High school degree	.57	.79	.58	.80
Some college	.07	0	.07	0
Bachelor's or higher	.18	0	.11	0
Economic outcomes				
Employed	.79	.74	.72	.66
Annual hours, conditional	1,633	1,510		1,585
Log annual earnings	7.53	6.90	6.89	6.30
Economic outcomes, no children				
Employed	.81	.76	.74	.79
Annual hours, conditional	1,727	1,586	1,652	1,762
Log annual earnings	7.94	7.16	7.22	7.63
Economic outcomes, with children				
Employed	.75	.72	.70	.63
Annual hours, conditional	1,513	1,439	1,594	1,528
Log annual earnings	7.03	6.68	6.65	5.96
N	163,320	121,967	54,681	52,703
N (hours)	129,786	92,056	40,060	35,428

The children variables are based on the presence of children 18 or under in the household. "Single" means divorced, widowed, or separated. "Married" means married, spouse present. For log earnings, $1 is substituted for zero earnings prior to taking logs. All estimates are weighted.

Table 1B: Descriptive Statistics for Individuals, 1997-2006

	Childless men and women, 18-35
	(1)
Male	.43
Black	.13
Hispanic	.14
Age	25.7
Married	.21
Highest education	
High school dropout	.12
High school degree	.54
Some college	.07
Bachelor's or higher	.27
Economic outcomes	
Employment	.84
Annual hours, conditional	1,793
Log wage	2.40
Log annual earnings	8.26
Economic outcomes, high school degree at most	
Employment	.80
Annual hours, conditional	1,687
Log wage	2.22
Log annual earnings	7.70
Economic outcomes, high school degree at most and black or Hispanic	
Employment	.75
Annual hours, conditional	1,723
Log wage	2.17
Log annual earnings	7.21
Economic outcomes, high school degree at most, single male, and black or Hispanic	
Employment	.77
Annual hours, conditional	1,753
Log wage	2.19
Log annual earnings	7.41
Economic outcomes, some college or higher	
Employment	.91
Annual hours, conditional	1,975
Log wage	2.70
Log annual earnings	9.35
N	177,393
N (log wage, hours)	150,748

See notes to Table 1A.

Table 1C: Descriptive Statistics for Families, 1997-2006

	18-45	Single women, 18-45	Single women, 18-45, high school degree at most	Single women, 18-45, black or Hispanic
Family head or individual	(1)	(2)	(3)	(4)
Female	.46	1	1	1
1 child	.17	.19	.21	.23
2+ children	.31	.23	.28	.34
Black	.14	.22	.26	.65
Hispanic	.15	.13	.16	.37
Age	32.8	31.2	30.6	31.4
Married, spouse present	.43	0	0	0
Married, spouse absent	.02	0	0	0
Divorced, widowed, or separated	.17	.35	.38	.31
Highest education				
High school dropout	.13	.13	.20	.23
High school degree	.51	.54	.80	.56
Some college	.09	.09	0	.07
Bachelor's or higher	.28	.24	0	.13
Economic outcomes				
Earnings < poverty	.20	.37	.47	.46
Earnings < .5·poverty	.13	.25	.33	.32
Economic outcomes, no children				
Earnings < poverty	.21	.30	.40	.35
Earnings < .5·poverty	.15	.21	.29	.26
Economic outcomes, with children				
Earnings < poverty	.20	.49	.55	.55
Earnings < .5·poverty	.11	.32	.36	.37
N	376,793	105,383	72,730	36,495

See notes to Table 1A. "Families" include primary or unrelated individuals.

Table 2: Estimated EITC Effects on Women, 1997-2006

	Single, 18-45	Single, 18-45, high school degree at most	Single, 18-45, black or Hispanic	Married, 18-45, high school degree at most
Employment	(1)	(2)	(3)	(4)
EITC × kids	.18 (.10)	.25 (.13)	.29 (.22)	-.14 (.24)
EITC	.01 (.04)	-.03 (.06)	.01 (.10)	.10 (.18)
N	163,320	121,967	54,681	52,703
Hours, conditional				
EITC × kids	26.8 (152.4)	15.2 (196.5)	37.5 (218.7)	-176.5 (277.5)
EITC	-94.4 (78.2)	-131.7 (123.0)	-248.2 (328.9)	247.5 (170.0)
N	129,786	92,056	40,060	35,428
Log earnings				
EITC × kids	1.80 (1.00)	2.58 (1.28)	2.25 (2.18)	-1.90 (2.52)
EITC	-.09 (.37)	-.54 (.63)	.19 (.12)	1.32 (1.77)
N	163,320	121,967	54,681	52,703

In the log earnings specification, $1 is substituted for zero earnings prior to taking logs. The estimated coefficients of the EITC-kids interactions are robust to including state-specific linear trends, or state-year interactions; in the latter specification the main EITC effect drops out. All estimates are weighted and standard errors are clustered on states.

Table 3A: Estimated EITC Effects on Low-Skilled, Childless, Individuals, Aged 18-35, 1997-2006

Low-skilled group:	Less-educated individuals	Less-educated black or Hispanic	Less-educated single black or Hispanic men
Log wages	(1)	(2)	(3)
EITC × low-skill	-.12 (.09)	-.12 (.08)	-.17 (.09)
EITC	.12 (.08)	.10 (.11)	.08 (.12)
N	150,748	85,050	70,768
Employment			
EITC × low-skill	-.07 (.06)	-.16 (.05)	-.18 (.06)
EITC	.03 (.04)	.04 (.04)	.03 (.03)
N	177,393	99,336	79,944
Hours, conditional			
EITC × low-skill	-156.2 (69.5)	-27.0 (70.9)	-38.8 (86.6)
EITC	30.2 (69.1)	-51.7 (63.6)	2.8 (109.2)
N	150,748	85,050	70,768
Log earnings			
EITC × low-skill	-.85 (.63)	-1.66 (.50)	-1.96 (.61)
EITC	.47 (.46)	.60 (.50)	.63 (.34)
N	177,393	99,336	79,944

Notes from Table 2 apply. The log wage regressions condition on positive earnings and hours of work in the previous year. "Low-skilled" is defined as high-school degree at most. For the results shown, the sample includes all those with at least some college and the low-skilled treatment group as defined in the column heading. The estimated of the EITC-low-skill interactions are robust to including state-specific linear trends, or state-year interactions.

Table 3B: Estimated EITC Effects on Low-Skilled, Childless, Individuals, Aged 18-35, Variation with Share Affected by EITC, 1998-2006

	Using share filing for EITC	Using share of single mothers
Log wages	(1)	(2)
EITC × low-skill	-.24	-.05
	(.04)	(.04)
EITC	.10	.03
	(.08)	(.08)
EITC × low-skill × 1997 filing/single mother share (× 10)	-.33	-.66
	(.15)	(.32)
N	139,099	139,099
Employment		
EITC × low-skill	-.18	-.03
	(.02)	(.02)
EITC	-.01	-.03
	(.06)	(.05)
EITC × low-skill × 1997 filing/single mother share (× 10)	-.23	-.62
	(.10)	(.15)
N	164,166	164,166
Hours, conditional		
EITC × low-skill	-163.8	-133.1
	(77.4)	(72.8)
EITC	96.4	.4
	(146.9)	(96.8)
EITC × low-skill × 1997 filing/single mother share (× 10^3)	-.9	-5.1
	(2.1)	(4.5)
N	139,099	139,099
Log earnings		
EITC × low-skill	-1.96	-.52
	(.20)	(.23)
EITC	.10	-.23
	(.70)	(.55)
EITC × low-skill × 1997 filing/single mother share (× 10^2)	-.25	-.64
	(.10)	(.16)
N	164,166	164,166

See notes to Table 3A. The sample corresponds to column (1) of that table. Data from 1997 are omitted; estimates corresponding to Table 3A excluding 1997 were very similar to estimates in Table 3A. The share in the interaction is demeaned, so the EITC × low-skill coefficient measures the relative effect of the EITC on the low-skilled at the mean of the corresponding share.

Table 4: Estimated EITC Effects on Family Earnings Relative to Poverty, 1997-2006

	Family head or individual, 18-45	Single female family head or individual, 18-45	Single female family head or individual, 18-45, high school degree at most	Single female family head or individual, 18-45, black or Hispanic
P(Earnings<Poverty)	(1)	(2)	(3)	(4)
EITC × kids	-.03	-.16	-.23	.08
	(.08)	(.16)	(.17)	(.24)
EITC	-.02	-.05	-.01	-.13
	(.05)	(.08)	(.10)	(.15)
P(Earnings< .5·Poverty)				
EITC × kids	-.07	-.30	-.36	-.06
	(.06)	(.18)	(.22)	(.25)
EITC	.00	-.01	.03	-.19
	(.04)	(.07)	(.09)	(.14)
N	376,793	105,383	72,730	36,495

See notes to Table 3A. The sample is restricted to heads of families, primary individuals, or unrelated individuals. The estimated coefficients of the EITC-kids interactions are robust to including state-specific linear trends, or state-year interactions.

Table 5: Estimated Effects of EITC-Minimum Wage Interactions on Women, 1997-2006

	Single, 18-45	Single, 18-45, high school degree at most	Single, 18-45, black or Hispanic
Employment	(1)	(2)	(3)
EITC × kids	.18 (.09)	.25 (.10)	.28 (.16)
EITC	.01 (.04)	-.03 (.06)	.01 (.08)
MW × kids	.03 (.05)	.02 (.06)	.06 (.12)
MW	.03 (.04)	.05 (.05)	-.01 (.09)
MW × EITC	-.03 (.24)	-.22 (.39)	-.43 (.34)
MW × EITC × kids	.47 (.21)	.64 (.32)	1.17 (.45)
Log earnings			
EITC × kids	1.76 (.81)	2.56 (1.00)	2.21 (1.59)
EITC	-.06 (.34)	-.54 (.55)	.18 (.89)
MW × kids	.40 (.42)	.30 (.47)	.95 (1.34)
MW	.23 (.33)	.27 (.38)	-.35 (1.00)
MW × EITC	-.96 (2.17)	-2.67 (3.15)	-5.17 (3.83)
MW × EITC × kids	5.33 (1.95)	6.57 (2.59)	12.9 (4.8)
N	163,320	121,967	54,681

See notes to Tables 2 and 3A. The minimum wage variable (MW) is the average of the log of the contemporaneous and lagged minimum wages. In the minimum wage-EITC interactions, the minimum wage variable is demeaned, so the EITC coefficients have the same interpretation (at the means) as in Table 2. The estimated coefficients of the EITC-kids, MW-kids, and EITC-MW-kids interactions are robust to including state-specific linear trends, or state-year interactions. Sample sizes are as in Table 2.

Table 6: Estimated Effects of EITC-Minimum Wage Interactions on Low-Skilled, Childless Individuals, Aged 18-35, 1997-2006

Low-skilled group:	Less-educated individuals	Less-educated black or Hispanic	Less-educated single black or Hispanic men
Log wages	(1)	(2)	(3)
EITC × low-skill	-.11 (.09)	-.12 (.07)	-.17 (.08)
EITC	.13 (.06)	.11 (.06)	.10 (.07)
MW × low-skill	-.05 (.04)	-.11 (.07)	-.13 (.07)
MW	.19 (.05)	.18 (.07)	.16 (.08)
MW × EITC	-1.04 (.29)	-1.00 (.32)	-.99 (.32)
MW × EITC × low-skill	.59 (.44)	.36 (.84)	.21 (.95)
Employment			
EITC × low-skill	-.06 (.06)	-.16 (.05)	-.19 (.05)
EITC	.03 (.03)	.04 (.03)	.03 (.03)
MW × low-skill	-.05 (.02)	.03 (.03)	.04 (.04)
MW	.09 (.02)	.05 (.02)	.02 (.03)
MW × EITC	-.12 (.13)	-.10 (.10)	-.06 (.11)
MW × EITC × low-skill	-.26 (.20)	-.79 (.24)	-.83 (.27)
Log earnings			
EITC × low-skill	-.80 (.62)	-1.68 (.44)	-1.99 (.52)
EITC	.50 (.31)	.66 (.28)	.70 (.25)
MW × low-skill	-.51 (.25)	.31 (.26)	.44 (.35)
MW	.97 (.22)	.47 (.17)	.33 (.21)
MW × EITC	-2.01 (1.29)	-1.53 (1.04)	-1.32 (1.22)
MW × EITC × low-skill	-2.37 (2.39)	-8.50 (3.23)	-9.39 (4.36)
N	177,393	99,336	79,944

See notes to Table 3A. "Low-skilled" is defined as high-school degree at most. In the minimum wage-EITC interactions, the minimum wage variable is demeaned, so the EITC coefficients have the same interpretation (at the means) as in Table 3A; the EITC variable is also demeaned in the interactions, so the minimum wage coefficients estimate the minimum wage effects at the mean EITC. The estimated coefficients of the EITC-low-skill, MW-low-skill, and EITC-MW-low-skill interactions are robust to including state-specific linear trends, or state-year interactions.

Table 7A: Estimated Effects of EITC-Minimum Wage Interactions on Teenage Males, 1997-2007

	All		Non-black, non-Hispanic		Black or Hispanic	
Employment	(1)	(2)	(3)	(4)	(5)	(6)
MW	-.065 (.036)	-.032 (.037)	-.052 (.047)	-.007 (.051)	-.103 (.052)	-.088 (.066)
EITC		-.042 (.073)		-.050 (.090)		.001 (.183)
MW × EITC		-.348 (.215)		-.471 (.250)		-.132 (.480)
Log wages						
MW	.236 (.065)	.245 (.069)	.351 (.072)	.382 (.075)	-.158 (.075)	-.207 (.095)
EITC		.143 (.120)		.076 (.123)		.410 (.180)
MW × EITC		.037 (.591)		-.250 (.609)		1.03 (.78)
Log earnings						
MW	-.318 (.199)	-.258 (.235)	-.123 (.239)	-.105 (.291)	-.789 (.195)	-.647 (.232)
EITC		-.396 (.373)		-.465 (.479)		-.123 (.839)
MW × EITC		-.903 (1.26)		-.571 (1.34)		-1.42 (1.72)
N	105,724		78,407		27,317	

The sample consists of individuals between the ages of 16 to 19 who are included in the monthly ORG files from the Current Population Survey between January 1997 and December 2007. Standard errors are clustered on state. All specifications include controls for the share of the population in the group studies, the statewide unemployment rate, education (16 categories), black, Hispanic, marital status (7 CPS categories), state, calendar year and month, and state-specific time trends. The minimum wage variable is the average of the log of the current month's state-specific minimum wage and the log of the minimum wage lagged one year. In the interactive specifications, the interaction is between the minimum wage variable minus its mean and the state EITC supplement. Earnings are the product of wages and weekly hours, and are set to zero if hours are zero; observations with nominal wages less than $1 are dropped. N refers to the size of the samples used in the employment and earnings regressions. The sample size for the wage regressions is smaller because individuals with zero hours are excluded. All estimates are weighted.

Table 7B: Estimated Effects of EITC-Minimum Wage Interactions on Teenage Females, 1997-2007

	All		Non-black, non-Hispanic		Black or Hispanic	
Employment	(1)	(2)	(3)	(4)	(5)	(6)
MW	-.080 (.057)	.003 (.051)	-.122 (.068)	-.046 (.071)	.017 (.068)	.115 (.065)
EITC		-.096 (.073)		-.038 (.101)		-.252 (.099)
MW × EITC		-.865 (.297)		-.746 (.412)		-1.14 (.32)
Log wages						
MW	.224 (.092)	.348 (.079)	.214 (.092)	.341 (.093)	.197 (.126)	.278 (.098)
EITC		-.006 (.131)		.006 (.143)		-.032 (.198)
MW × EITC		-1.33 (.34)		-1.30 (.43)		-1.04 (.67)
Log earnings						
MW	-.271 (.260)	.103 (.277)	-.407 (.304)	-.057 (.372)	-.017 (.345)	.411 (.274)
EITC		-.343 (.408)		-.012 (.549)		-1.28 (.60)
MW × EITC		-3.85 (1.44)		-3.35 (1.69)		-5.14 (1.68)
N	104,807		77,616		27,191	

See notes to Table 7A.

Table 8: Estimated Effects of EITC-Minimum Wage Interactions on Family Earnings Relative to Poverty, 1997-2006

	Family head or individual, 18-45	Single female family head or individual, 18-45	Single female family head or individual, 18-45, high school degree at most	Single female family head or individual, 18-45, black or Hispanic
P(Earnings<Poverty)	(1)	(2)	(3)	(4)
EITC × kids	-.03 (.06)	-.16 (.12)	-.24 (.13)	.08 (.21)
EITC	-.02 (.03)	-.05 (.06)	-.01 (.07)	-.14 (.13)
MW × kids	.04 (.03)	-.07 (.07)	-.05 (.08)	-.10 (.13)
MW	-.08 (.03)	-.04 (.06)	-.07 (.06)	-.05 (.09)
MW × EITC	.41 (.23)	.47 (.34)	.64 (.52)	.23 (.63)
MW × EITC × kids	-.49 (.28)	-.85 (.57)	-.72 (.90)	-.67 (1.01)
P(Earnings< .5·Poverty)				
EITC × kids	-.06 (.04)	-.29 (.12)	-.35 (.15)	-.05 (.21)
EITC	-.01 (.03)	-.02 (.06)	.02 (.08)	-.19 (.13)
MW × kids	.04 (.03)	-.04 (.08)	-.00 (.09)	-.14 (.15)
MW	-.08 (.03)	-.10 (.06)	-.15 (.08)	-.01 (.11)
MW × EITC	.27 (.23)	.36 (.45)	.59 (.72)	.30 (.87)
MW × EITC × kids	-.47 (.29)	-1.09 (.65)	-1.42 (.98)	-.95 (1.14)

See notes to Tables 3A and 4. In the minimum wage-EITC interactions, the minimum wage variable is demeaned, so the EITC coefficients have the same interpretation (at the means) as in Table 4. The estimated coefficients of the EITC-kids, MW-kids, and EITC-MW-kids interactions are robust to including state-specific linear trends, or state-year interactions. Sample sizes are as in Table 4.

Table 9: Implied Effect on Employment of 10% State EITC Supplement on Single Women, at Different Minimum Wage Levels, Based on Table 5 Estimates

	Single female, 18-45	Single female, 18-45, high school degree at most	Single female, 18-45, black or Hispanic
	(1)	(2)	(3)
At sample mean of minimum wage			
With children	.019 (.008)	.022 (.009)	.029 (.011)
Childless	.001 (.004)	-.002 (.006)	.001 (.008)
Difference	.018 (.008)	.025 (.010)	.028 (.016)
Minimum wage 10% higher			
With children	.023 (.009)	.026 (.010)	.036 (.011)
Childless	.001 (.005)	-.005 (.008)	-.003 (.008)
Difference	.023 (.009)	.031 (.010)	.040 (.016)
Difference relative to effect at mean minimum wage			
With children	.004 (.002)	.004 (.002)	.007 (.002)
Childless	-.000 (.002)	-.002 (.004)	-.004 (.003)
Difference	.005 (.002)	.006 (.003)	.012 (.004)
Minimum wage 25% higher			
With children	.030 (.011)	.033 (.013)	.047 (.013)
Childless	.000 (.008)	-.008 (.013)	-.010 (.010)
Difference	.030 (.010)	.041 (.012)	.057 (.017)
Difference relative to effect at mean minimum wage			
With children	.011 (.005)	.011 (.005)	.018 (.005)
Childless	-.001 (.006)	-.005 (.010)	-.011 (.008)
Difference	.012 (.005)	.016 (.008)	.029 (.011)

t-statistics are the same by construction for the calculation of differences relative to the mean minimum wage using the minimum wage 10% or 25% above the sample mean. The estimated differences are robust to including state-year interactions; in these specifications only the differences are identified. See notes to Table 5.

Table 10: Implied Effect on Log Earnings of 10% State EITC Supplement on Childless Individuals Aged 18-35, at Different Minimum Wage Levels, Based on Table 6 Estimates

Low-skilled group:	Less-educated individuals	Less-educated black or Hispanic	Less-educated single black or Hispanic men
At sample mean of minimum wage	(1)	(2)	(3)
Low-skill	-.030 (.050)	-.101 (.054)	-.129 (.058)
High-skill	.050 (.031)	.066 (.028)	.070 (.025)
Difference	-.080 (.062)	-.168 (.044)	-.199 (.052)
Minimum wage 10% higher			
Low-skill	-.074 (.042)	-.202 (.052)	-.236 (.056)
High-skill	.030 (.036)	.051 (.031)	.056 (.025)
Difference	-.104 (.053)	-.253 (.038)	-.292 (.045)
Difference relative to effect at mean minimum wage			
Low-skill	-.044 (.016)	-.100 (.027)	-.107 (.036)
High-skill	-.022 (.013)	-.015 (.010)	-.013 (.012)
Difference	-.024 (.024)	-.085 (.032)	-.094 (.044)
Minimum wage 25% higher			
Low-skill	-.140 (.040)	-.352 (.072)	-.397 (.088)
High-skill	-.000 (.050)	.028 (.042)	.037 (.035)
Difference	-.140 (.059)	-.380 (.069)	-.433 (.090)
Difference relative to effect at mean minimum wage			
Low-skill	-.110 (.041)	-.251 (.068)	-.268 (.089)
High-skill	-.050 (.032)	-.038 (.026)	-.033 (.031)
Difference	-.059 (.060)	-.212 (.081)	-.235 (.109)

t-statistics are the same by construction for the calculation of differences relative to the mean minimum wage using the minimum wage 10% or 25% above the sample mean. High-skill refers to individuals with at least some college; low-skill is defined as a high-school degree at most. The estimated differences are robust to including state-year interactions; in these specifications only the differences are identified. See notes to Table 6.

Table 11: Implied Effect on Family Earnings of 10% State EITC Supplement on Family Earnings Relative to Poverty, at Different Minimum Wage Levels, Based on Table 8 Estimates

	Family head or individual, 18-45	Family head or individual, 18-45	Single female family head or individual, 18-45	Single female family head or individual, 18-45
	P(earnings < poverty)	P(earnings < .5·poverty)	P(earnings < poverty)	P(earnings < .5·poverty)
At sample mean of minimum wage	(1)	(2)	(3)	(4)
With children	-.0047 (.0034)	-.0070 (.0026)	-.0212 (.0090)	-.0309 (.0100)
Childless	-.0021 (.0034)	-.0006 (.0035)	-.0054 (.0064)	-.0015 (.0058)
Difference	-.0026 (.0056)	-.0064 (.0040)	-.0158 (.0121)	-.0294 (.0120)
Minimum wage 10% higher				
With children	-.0055 (.0033)	-.0089 (.0025)	-.0250 (.0072)	-.0382 (.0087)
Childless	.0019 (.0044)	.0021 (.0049)	-.0007 (.0064)	.0021 (.0079)
Difference	-.0075 (.0057)	-.0111 (.0051)	-.0243 (.0099)	-.0403 (.0111)
Difference relative to effect at mean minimum wage				
With children	-.0008 (.0009)	-.0020 (.0010)	-.0039 (.0029)	-.0073 (.0029)
Childless	.0041 (.0023)	.0027 (.0023)	.0047 (.0034)	.0036 (.0045)
Difference	-.0049 (.0028)	-.0047 (.0029)	-.0085 (.0057)	-.0109 (.0065)
Minimum wage 25% higher				
With children	-.0068 (.0038)	-.0118 (.0031)	-.0308 (.0064)	-.0491 (.0076)
Childless	.0080 (.0071)	.0062 (.0079)	.0063 (.0092)	.0076 (.0134)
Difference	-.0148 (.0080)	-.0180 (.0085)	-.0371 (.0121)	-.0568 (.0158)
Difference relative to effect at mean minimum wage				
With children	-.0021 (.0023)	-.0049 (.0025)	-.0097 (.0074)	-.0182 (.0073)
Childless	.0102 (.0058)	.0068 (.0058)	.0117 (.0085)	.0091 (.0113)
Difference	-.0123 (.0070)	-.0116 (.0073)	-.0213 (.0143)	-.0273 (.0163)

t-statistics are the same by construction for the calculation of differences relative to the mean minimum wage using the minimum wage 10% or 25% above the sample mean. The estimated differences are robust to including state-year interactions; in these specifications only the differences are identified. See notes to Table 8.