Do State Earned Income Tax Credits Increase Participation in the Federal EITC?

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Abstract

In recent years, many states and some local governments implemented or expanded their own, supplemental Earned Income Tax Credit (EITCs). The expansion of state EITCs may have stemmed in large part from wanting to provide a more generous program than the federal program, because state EITCs increase transfer payments to the low-income recipients who qualify. However, state and local governments can also benefit from maximizing participation of their constituents in the federal EITC, and there are several reasons why state or local EITCs could increase participation in the federal EITC program. We find evidence that state EITCs increase federal EITC program participation. The effects are qualitatively consistent with what we would expect given theoretical predictions of the effects of an increase in state EITC generosity on labor supply.

I. Introduction

The Earned Income Tax Credit (EITC) is a federal program that provides refundable tax credits for working people with low to moderate incomes. Initially enacted in 1975 to help offset the regressive effects of rising payroll taxes for lower-income working families, the EITC underwent significant expansions in the 1980s and 1990s. The EITC has become the largest federal cash transfer program in the United States, with about 26 million families receiving over $65 billion in cash assistance in tax year 2015 (Internal Revenue Service, 2016). The EITC is designed primarily to benefit low-income families with children; there is only a small credit available to qualifying workers without children.

In recent years, many states and some local governments implemented or expanded their own, supplemental EITCs. The first state EITC was offered in Rhode Island in 1986, and by 2015, the number of state EITC programs had increased to 26, including the District of Columbia (Internal Revenue Service, n.d.). In addition, a small number of EITCs have been introduced at a local level.[1] The state and local EITCs supplement the federal credit and are usually structured as a percentage add-on to the federal credit. Most of the supplemental EITCs are refundable.[2]

The expansion of state EITCs may have stemmed in large part from simply wanting to provide a more generous program than the federal program, because state EITCs increase transfer payments to the low-income recipients who qualify. However, state and local

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[1] Local government EITCs have been introduced in Montgomery County, Maryland, New York City, New York, and San Francisco, California. The San Francisco program (the Working Families Credit) is not formally a city EITC, but is a program designed to encourage families to apply for the federal EITC (and other federal benefits), by paying a one-time credit to families that qualify for and claim the federal EITC (for the first time). See http://www.icarol.info/ResourceView2.aspx?org=2339&agencynum=10610802 (viewed October 11, 2016).

[2] In 2015, out of the 26 states (including the District of Columbia) that offered an EITC, 22 were either partially or fully refundable.

governments can also benefit from maximizing participation of their constituents in the federal

EITC, for reasons discussed below. In this paper, we evaluate whether these supplemental

EITCs encourage federal EITC participation, which could provide another motivation besides the

direct effect of supplemental EITCs for state and local governments to offer these programs.

Existing research has generally found that the EITC boosts employment and earnings for

single mothers (e.g., Eissa & Liebman, 1996; Meyer & Rosenbaum, 2001) and reduces the share

of families in poverty (Neumark & Wascher, 2001; Hoynes & Patel, 2015). Other work has

suggested that the EITC has positive effects on consumption (Goodman-Bacon & McGranahan,

2008), child and maternal health (Hoynes et al., 2015; Evans & Garthwaite, 2014), and child

achievement (Dahl & Lochner, 2012). Nonetheless, not all eligible recipients claim their

benefits, with the overall take-up rate estimated to be around 75% (Scholz, 1994; Plueger,

2009).[3] This take-up rate is relatively high compared to other social programs such as food

stamps or Temporary Assistance for Needy Families, but nevertheless, improving program

participation can have positive welfare effects for qualified working families (Currie, 2006).

State and local governments should be interested in maximizing participation of their

constituents in the federal EITC. First, because the EITC effectively increases incomes of poor

and low-income families – especially those with children – increased participation can improve

the economic circumstances of low-income families and children in their jurisdictions. Second,

state and local economies can potentially benefit from increased federal tax dollars flowing into

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[3] The take-up rate is typically defined in the literature as total EITC participants per eligible filer. The general approach to estimating a take-up rate is to use administrative data to estimate the total number of participants and survey data to estimate those eligible. Eligibility is often simulated based on income and household characteristics in the survey data. However, in this paper, we are interested in changes in federal EITC participation that are potentially related to behavioral labor supply responses to increased state EITC generosity, thus affecting eligibility. To avoid any endogenous income responses, we use an estimate of potentially eligible filers that does not depend on income. (While our measure might be closer to a "participation" measure than a "take-up" measure, we sometimes refer to take-up.)

the jurisdiction (to EITC recipients). Even if forward-looking governments account for higher federal tax payments, there is no reason to think the local burden of federal taxes will reflect local participation in the EITC.[4] And third, if this take-up is accompanied by increased employment due to behavioral responses to the federal EITC, the higher take-up can reduce the burden on state-provided income (and other) supports to these families.

There are several reasons why state or local EITCs could increase participation in the federal EITC program. Existing studies of the federal EITC have found that informational complexity and low program awareness contribute importantly to low EITC participation (Chetty et al., 2013; Bhargava & Manoli, 2015; Manoli & Turner, 2016).[5] To receive the federal EITC, eligible workers must file a federal tax return, even if their income is below the federal filing requirement. Because the EITC targets low-income working families, many eligible workers may not be familiar with how to file a tax return, or even know what tax credits are available. To address these issues, in addition to the Internal Revenue Service (IRS), state and local governments have engaged in outreach efforts to promote both state and federal EITCs (Internal Revenue Service, n.d.), often in conjunction with passage of a state or local EITC.

For example, when California enacted its own EITC program in 2015, the state's Franchise Tax Board partnered with community-based organizations, non-profits, and other government agencies to raise awareness of both the federal and state credits.[6] Efforts included a

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[4] Even if it does, there might still be positive short-term effects, as evidence suggests that EITC eligible households increase consumption spending in the months that they are likely to receive their EITC refund (Barrow & McGranahan, 2000).

[5] Other possible explanations for low social program take-up include social stigma or high perceived economic costs of claiming (Bhargava & Manoli, 2015). It is unlikely that social stigma is relevant to the EITC, given that it is claimed through one's tax return, and hence participation is most likely unknown to employers or others. Although through 2010 EITC recipients could choose to get their EITC in each paycheck, nearly all chose to take their payment as a lump sum at the end of the year, which may have been to avoid stigma effects.

[6] See https://www.ftb.ca.gov/individuals/faq/net/900_media.shtml (viewed August 9, 2016).

direct mailer campaign to California taxpayers with incomes below the state filing requirement, education outreach events, and marketing materials with information about the available credits. To help taxpayers who may not know how to file for the EITC, the state also collaborated with local partners to provide free tax assistance services. Moreover, the San Francisco Working Families Credit appears to have been designed specifically with this goal in mind (Flacke & Wertheim, 2006).[7] State or local governments that successfully promote their own EITCs should increase federal EITC participation, since in order to receive a state or local EITC, qualifying workers must file a state tax return and have already filed a federal tax return and completed the federal EITC application.

In some states, low-income individuals may be required to file a state income tax return when they do not have to file a federal tax return. For instance, a state may have a lower income filing requirement than the federal requirement. For these low-income individuals that already file a state return, they may learn about the federal EITC if the state offers their own supplemental program through additional EITC qualifying questions asked on their state tax return.

Finally, because the state (or local) EITC supplement to the federal EITC increases the effective wage an eligible person (most notably, single mothers) can earn, it has an unambiguously positive predicted effect on employment for single taxpayers, which will spur higher federal EITC participation. One effect that might be viewed less positively by state or local policymakers is that, because EITC eligibility is based on family income, a higher state EITC may create a disincentive to work for some individuals above the pre-state EITC eligibility

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[7] The program also engaged in a marketing campaign to expand awareness of the EITC. See http://www.workingfamiliescredit.org/whatiswfc.htm (viewed May 29, 2016).

range, lowering employment but increasing EITC participation.[8]

State EITC policy variation has been used in prior studies to examine the effect of the EITC on employment (Meyer & Rosenbaum, 2001; Neumark & Wascher, 2011), poverty (Neumark & Wascher, 2001), marriage (Dickert-Conlin & Houser, 2002), and fertility (Baughman & Dickert-Conlin, 2009). These studies do not focus on the effect of state EITCs explicitly or as the key policy instrument, instead using the state EITC variation to strengthen the identification of the overall EITC effect. The question we ask in this paper is different, and has not yet been addressed – specifically, whether these supplemental EITCs encourage federal EITC participation.

To answer this question, we exploit variation in state EITC policies across states and over the years 1997-2008. During these sample years, there was substantial state-level EITC policy variation, but there were no major changes to the federal EITC structure.[9] Since the federal EITC structure remained relatively stable during this period, we are able to focus on the state EITC policy variation in identifying how changes in state EITC generosity can affect federal EITC program participation.

We measure program participation using data on federal EITC recipients per potential filer. Data on federal EITC recipients come from the IRS' Statistics of Income (SOI) annual public-use samples of federal tax returns. These data do not include detailed demographic or employment information, so we also use data on individuals from the Current Population Survey

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[8] Eissa and Hoynes (2004) find that federal EITC expansions led to a decline in labor force participation for married women, and a slight increase in labor force participation for married men.
[9] There was a major increase in the generosity of the federal EITC between 1990 and 1996, especially for families with children, in 1996, and a modest change increasing its generosity for families with three or more children in 2009 and married filers. See http://www.taxpolicycenter.org/sites/default/files/legacy/taxfacts/content/PDF/historical_eitc_parameters.pdf (viewed October 11, 2016).

Annual Social and Economic Supplement (CPS ASEC) to construct estimates of potential filers, and to assess whether the effects are larger where more people are likely eligible.

Overall, our estimates indicate that state EITCs do increase federal EITC program participation. Moreover, the effects are qualitatively consistent with what we would expect given theoretical predictions of the effects of an increase in state EITC generosity on labor supply. In particular, we find some evidence that the increased federal EITC participation occurred for single filers with children, and that the federal participation response is stronger in states with a larger share of the population that is likely to be affected by state EITC policies.

II. Federal and State Earned Income Tax Credits

The federal EITC is a refundable tax credit, administered through the federal tax system. Eligibility is based in part on earned income of a tax-filing unit, and qualifying income must be positive and below the maximum allowable amount. The credit amount an eligible taxpayer receives depends on the taxpayer's positive earned income and the number of EITC qualifying children.

Figure 1 illustrates the federal EITC structure for the year 2008, the last year in our sample period. The credit amount is displayed as a function of earnings for single filers with zero, one, and two or more EITC qualifying children.[10] As shown in Figure 1, the EITC is far more generous for taxpayers with children. In 2008, the final year in our sample, the maximum credit amount available was $438 for childless taxpayers, $2,917 for EITC recipients with one child, and $4,824 for EITC recipients with two or more children.[11]

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[10] The values of the beginning and ending points of the phase-out range for married taxpayers filing jointly were increased beginning in 2002. See
http://www.taxpolicycenter.org/sites/default/files/legacy/taxfacts/content/PDF/historical_eitc_parameters.pdf (viewed October 11, 2016).

[11] More recently, in 2015 the maximum credit available was $503 for childless taxpayers, $3,359 for filers with one child, $4,448 for filers with two children, and $6,242 for filers with three or more children.

The EITC structure is characterized by three main regions. The "phase-in" region is the range of income for which the credit amount increases and is equal to earned income times the applicable credit rate. During the sample years 1997-2008, the phase-in federal credit rate was 40% for eligible families with two or more children, 34% for families with one child, and 7.65% for childless taxpayers. Next, the "plateau," or flat region, is the range of income for which the maximum credit amount is received. Finally, the "phase-out" region is the range of income for which the EITC credit amount declines with each additional dollar of income, declining by 21.06% for families with two or more children, 15.98% for families with one child, and 7.65% for childless filers, until no credit is available.

In addition to the federal EITC, as of 2015, 26 states (including the District of Columbia) had enacted their own supplemental EITCs. Generally, state EITCs are based on federal guidelines for eligibility and are structured as a percentage of the federal EITC credit.[12] The dashed line in Figure 1 shows how a 16% state supplemental EITC (the average supplement amount during our sample period) increases the total credit amount received by eligible taxpayers with two or more children.

There is considerable variation in the adoption of state EITCs during the sample period 1997-2008, both across states, over time, and in supplement generosity. In 1997, only nine states offered an EITC, with supplements ranging from 5% to 50% of the federal credit. By 2008, 23 states offered an EITC, with supplements ranging from 3.5% to 40% of the federal credit.

Figure 2 displays the average supplement, expressed as a proportion of the federal credit, by year. For each year, the solid line shows the average supplement for all states, and the dashed

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[12] During the sample period, only two states did not express the state EITC supplement as a simple percentage of the federal EITC. In Minnesota, the state supplement percentage varies with income, so the average supplement amount is used (33%). In Wisconsin, the state supplement percentage depends on the number of children, so we use the supplement for families with two children (14%).

line shows the average supplement for states that had a supplement in that year. The rising solid line reflects the increasing number of states adopting the EITC. The dashed line suggests that, for the most part, average generosity of the state EITCs adopted has been constant, at least since about 2001. Further detail is provided in in Figure 3, which displays which states had an EITC, and information on the average supplement amount by state (in ranges), for various years during and bracketing the sample period.

Figures 4 and 5 display the number of states with EITCs and the number of federal EITC filers per potentially eligible population for the sample years 1997-2008 (from data discussed in more detail below). These time series are broadly consistent with an increase in prevalence of state EITCs leading to increased participation in the federal EITC, although of course other factors could drive the increases in federal participation.[13]

III. Changes in Participation via Labor Supply Effects

We explained in the introduction that increased publicity and outreach efforts related to state EITCs can increase federal EITC participation. However, a state EITC can also affect federal program participation through labor supply responses to the increased credit generosity. The potential labor supply responses that can independently affect EITC participation can help predict where we are most likely to see a participation response and hence help establish whether the effects we estimate are real or spurious. We discuss the predicted extensive margin labor supply effects for both single and married taxpayers and then relate the predicted employment responses to the predicted changes in federal EITC participation.[14]

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[13] The dip in EITC participation in the late 1990s is likely associated with the very sharp decline in poverty from 1997 to 2000, from 13.3% to 11.3%. (See http://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-people.html, Table 2, viewed October 13, 2016).

[14] We focus on the extensive margin labor supply responses because they have the clearest implications for EITC participation. While a state EITC can also affect intensive-margin labor supply decisions, these

In the standard labor-leisure choice model, an individual's labor supply decision is determined by their utility function and budget constraint. An individual receives utility from consumption of goods (M) and consumption of leisure (L). Their consumption of goods and leisure is constrained by time and income, via the budget constraint:

$$M = Y + w(T - L) \qquad (1)$$

M is the total amount spent on consumption (with a maximum of $Y + wT$), Y is non-labor income, w is the hourly wage rate, and T is total hours allocated to work (H) or leisure (L), where $T = H + L$.

In Figure 6, the solid line illustrates an individual's budget constraint without the EITC (labeled "No EITC"), showing consumption as a function of leisure hours. As leisure hours increase, hours worked decrease, and earned income decreases, until all time is spent on leisure and $M = Y$. Figure 6 also illustrates how a federal and a state EITC shift the budget constraint. Because state EITCs are based on federal income eligibility requirements and typically pay a percentage of the federal EITC, the budget line shares the same kink points as the budget line with the federal EITC. The state EITC steepens the budget line in the phase-in and phase-out regions and increases the maximum credit amount received.

Labor Supply Effects: Not Working Prior to State EITC

Prior to the state EITC, some individuals choose not to work due to a high reservation wage (because of, for example, high non-labor income or a high value of home production owing to the presence of small children). A federal EITC may not increase their effective wage enough to exceed their reservation wage and induce labor market entry, but the additional state EITC supplement may raise their net wage enough to encourage labor market entry. This case is

decisions do not affect federal EITC participation decisions (unless one reduces labor supply enough to become eligible).

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depicted in Figure 7.

Thus, for single earners initially not working, a state EITC is expected to have an unambiguously positive effect on employment, because there is a positive substitution effect and no income effect. Consequently, federal EITC participation is also expected to increase as these individuals start working to qualify for the credit.

The predicted labor supply response for a married secondary earner can differ, because EITC eligibility depends on total family income. If neither the primary nor the secondary earner is initially working, then by the same argument as above we would expect a state EITC to sometimes draw at least one of them into the labor market, thus possibly increasing federal EITC participation. However, if the primary earner is already working, and the primary earner's income falls in the EITC eligible range, an increase in a state EITC can be viewed as an increase in non-labor income for the secondary earner, in which case the effect of a state EITC on the secondary earner's employment is ambiguous. The additional non-labor income effectively raises their reservation wage, creating a disincentive to work. However, the positive substitution effect could outweigh this, and increase employment. In any event, these kinds of responses are not expected to affect federal EITC participation for the tax filing unit.

Labor Supply Effects: Pre-State EITC Income above EITC Phase-Out Range

For some individuals with pre-EITC income above the phase-out region of the credit, the altered budget set can induce them to reduce their hours so that their earned income falls in the EITC-eligible range. Figure 8 illustrates this case. Originally, the individual earns too much to qualify for the credit, but they are able to increase their utility by working less and receiving the EITC.

This effect can arise for single taxpayers or secondary earners. In the latter case, if the

family's combined income exceeds the EITC income eligibility requirements, but falls into the EITC income eligibility range without the secondary earner's income, the secondary earner may reduce their hours or stop working. If these individuals adjust their labor supply so that their family income falls within the EITC eligible range, EITC participation is expected to increase.

Table 1 summarizes the predicted extensive labor supply responses and the effect on federal EITC participation for single and married filers with children. As the preceding discussion and Table 1 illustrate, the predicted effects of state EITCs on employment and federal EITC participation can depend on marital/filing status and where the individual's or family's income falls on the budget constraint.

An additional complication is that these predicted labor supply and hence EITC participation responses do not account for general equilibrium effects. In particular, some workers may be adversely affected by the increased labor supply of EITC filers with children due to increased competition for jobs (e.g., Leigh, 2010). To study the potential adverse (and presumably unintended) disemployment effects, we evaluate responses of childless EITC filers to state EITCs.[15] For this group, if there is a general equilibrium disemployment effect, EITC participation is expected to decrease due to childless EITC recipients losing eligibility.

IV. Data

Ideally, to examine the effect of state EITCs on federal EITC participation, we would need data on EITC filers, potentially eligible filers, and their location on the budget constraint. Data on EITC tax filers come from the SOI public use tax files, which are cross-sectional samples of nationally representative U.S. federal individual income tax returns. The SOI data include information on EITC recipients and the credit amount received, filing/marital status, the

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[15] Again, while a tax credit is available for childless filers, the small credit offered is unlikely to induce a significant behavioral labor supply response.

number of EITC qualifying children, and state of residence. However, while rich in tax income information, the SOI data cannot be used to locate individuals on the budget constraint. The SOI data do not include information on employment, hours, or wages, or useful demographic information that might be useful for drawing some inferences about wage levels and hence eligibility, such as age, race, sex, or education. Furthermore, the SOI data are a sample of tax filers, so from these data we are unable to capture whether a state EITC affects filing a federal tax return (and hence presumably getting the EITC if eligible), since we do not have data on eligible units that did not file a tax return.[16]

However, we use state-level demographic and labor force data from the CPS ASEC to estimate the share of potentially eligible filers and the share that might be at different locations on the budget constraint, to test whether the EITC participation results vary across states in the manner predicted by the labor supply model.[17] Among working individuals, low-skilled workers are more likely to be on the phase-in region of the EITC budget constraint, relative to high-skilled workers. As a proxy for low-skilled, we use data on individual's education from the CPS ASEC. We define low-skilled as having no more education than a high school degree.

We identify potentially eligible filers in the CPS ASEC based on EITC program qualifying rules unrelated to income, to avoid any endogenous income responses. Specifically, a household or individual was identified as potentially eligible if they had a qualifying child, defined as a child who was under the age of 19, under the age of 24 and a full-time student, or

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[16] For the sample of single files with children, estimates for the outcome of total federal tax filers per potentially eligible population are very similar to estimates for the outcome of EITC filers per potentially eligible population, suggesting that for this group, filing for the EITC often occurred simultaneously with filing a federal tax return.

[17] The CPS ASEC is an annual survey of households that provides information related to work, program participation, income, demographics, and more. Individuals are typically surveyed in March and are asked about income and employment in the previous year.

permanently disabled.[18] The CPS ASEC only includes information on children living at home,

but that is appropriate since EITC eligibility is based on qualifying children living at home.

Potentially eligible childless filers were identified as household heads between the ages of 25 and

65.

To combine the individual-level tax filer data with the CPS ASEC data, both datasets are

aggregated to the state and year level. [19] Prior to aggregating the SOI data, we restrict the tax

filer sample to exclude all high-income filers, for which there are no state identifiers due to

confidentiality reasons. We exclude filers from Puerto Rico, Guam, and the Virgin Islands, and

U.S. citizens and military personnel living abroad, since these filers are all assigned the same

geographic identifier. Finally, the tax filer sample excludes late filers.

Using the aggregated CPS ASEC and SOI data, for each state-year cell we construct

estimates of EITC recipients per potentially eligible population for single filers with children,

married filers with children, and childless filers.[20] We evaluate these groups separately since the

participation responses likely differ for these groups, with the sharpest prediction being – as the

previous section explained – that a state EITC increases federal EITC participation (and

employment) for single filers with children.

Additionally, the CPS ASEC data are used to construct state-year level estimates of

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[18] As mentioned previously, a true estimate of EITC take-up would be based on actual eligibility (EITC
filers per eligible filers). However, since we are interested in how state EITCs induce federal EITC
participation through employment (as one channel), this measure would not be appropriate, as both EITC
filing and eligibility would respond. Thus, while our potentially eligible measure overestimates the true
eligible population, it avoids any endogenous responses to changes in the state EITC that affect eligibility.
[19] The CPS ASEC potentially eligible population estimates are constructed using the family head's
weight. The SOI tax filer estimates are constructed using the SOI sample weights.
[20] In the tax filer data, we define single to include individuals who reported their tax filing status as single,
head of household (which requires the filer to be unmarried), or widowed. Additionally, since taxpayers
filing as married filing separately cannot claim the EITC, we exclude these filers from the SOI sample,
and we exclude individuals who report being married, but spouse absent from the CPS ASEC sample.

employment and various demographic measures for each group, including the share of the population with low-skill and the share of the population that is female, Hispanic, or black. We use the employment estimates to replicate some prior results in the literature – and results that underlie some of the predictions about EITC participation responses – and we use the other estimates as control variables in our specifications.

These data are combined with data on state unemployment rates and state and federal minimum wages (which also serve as controls), and data on historical state EITC parameters, which is our source of policy variation. The historical EITC parameters are taken from the Center on Budget and Policy Priorities and are expressed as a proportion of the federal credit. Additionally, existing research suggests that minimum wage effects may arise with a lag, so we use the average of the current and lagged year's minimum wage (defined as the higher of the state or federal minimum wage).

The sample period covers the years 1997-2008, the years for which we have data on state EITC policies and for which the federal EITC structure remains unchanged.[21] Table 2 displays summary statistics for the distribution of federal tax filers, our measure of federal EITC participation (EITC Filers per Potentially Eligible Population), and our state EITC policy

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[21] It is important to note how the data years are combined. The CPS ASEC data are reported for each survey year. Each survey is typically given in March of the survey year, and asks about employment and income in the previous calendar year, but asks about demographic information for the current calendar/survey year. For example, data from survey year 2008 refers to employment in calendar year 2007, but demographic information in March 2008. Thus, for the employment specifications, the CPS ASEC data from the previous survey year are matched to SOI tax years and the corresponding policy data calendar years. In the EITC participation regressions, using the previous survey year's data is not appropriate, since the demographic information is asked in March of that year. However, when determining the potentially eligible population based on children's age, it is possible that some children may not be counted properly. For example, an EITC qualifying child must be younger than 19 at the end of the tax year (December 31). So, if a child is 18 in the March 2008 survey, they would be counted as a qualifying child in tax year 2008, even if they turn 19 during that year (birthdays are not reported). To help account for this inconsistency, we take an average of the current and following survey years' potentially eligible population (and corresponding low-skilled population).

variables. The majority of the EITC recipients are single filers with children. In 2008, 59% of federal EITC filers were single with children, and they received 74% of all federal EITC expenditures. Childless filers only received about 3% of all federal EITC dollars – much less than proportionate to their share of filers (22%) because of the low EITC payments for this group.

V. Empirical Approach and Specifications

Examining the Effect of State EITCs on Employment

First, to confirm our theoretical labor supply predictions, we attempt to replicate earlier results from Neumark & Wascher (2011) evaluating the effects of state EITCs on employment. If we wanted to precisely estimate the effect of state EITCs on employment, it would be better to use the greater sample variation provided by the individual-level CPS ASEC data. However, our goal is different. In particular, our identification strategy for studying federal EITC take-up is limited by the lack of detailed demographic information in the SOI tax filer data, and the need to aggregate the SOI and CPS ASEC data when constructing our measures of program participation. Thus, we do the replication of the employment effects using the aggregated CPS ASEC data to see whether the predicted labor supply effects, which in part underlie effects on federal EITC participation, arise in the data aggregated in this manner.

Before fully restricting our data to the constraints imposed in the SOI data, we aggregate the CPS ASEC data to cells that vary by state, year, number of kids (0, 1, 2, 3+), and skill-level (with low-skilled defined as having no more than a high school degree). We then estimate the following difference-in-difference-in-differences specification, which is a more aggregated version of the specification estimated in Neumark & Wascher (2011):

$$Y_{stkl} = \alpha + \beta_1 EITC_{st} + \beta_2 EITC_{st} \cdot Kids_{stkl} + X_{stkl}\pi + \gamma_s + \lambda_t + \varepsilon_{st} \qquad (2)$$

Y_{stkl} is the average employment rate for state s in year t for group k (0, 1, 2, 3+ kids) and for skill level l (low-skilled or not). $EITC$ is the state EITC expressed as a proportion of the federal credit, and is equal to zero if the state did not have an EITC. $Kids$ is a dummy variable equal to one if the number of kids is greater than zero, and is zero otherwise. X_{stkl} is a matrix of state-year-kids-skill group controls, including the share that is black, share Hispanic, the share of the sample with young children, the share that are low-skilled, and average age. The specification also controls for group dummy variables for 1, 2, and 3+ kids, and the state unemployment rate.

State fixed effects (γ_s) are included to control for unobservable differences across states that may be correlated with EITC adoption. Year fixed effects (λ_t) control for other time-varying factors that are common to all states but may be correlated with state EITC policy changes, such as the national business cycle, or changes to other federal policies. We also include interactions between $Kids$ and the state and year dummy variables to control for changes over time in the relationship between the presence of children in the home and employment (and the federal EITC variation), as well as differences across states.[22] To account for arbitrary patterns of serial correlation within states, and heteroscedasticity across states, standard errors are clustered at the state level. The employment regressions are weighted by the number of observations in each cell.

We analyze specification (2) for a sample of all single women, and a subsample of low-skilled single women. We also restrict the sample to single mothers, replacing the $EITC$ and $Kids$ interaction with an $EITC$ and $Lowskilled$ interaction, because among single mothers the

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[22] Similarly, we also include low-skilled and state and year dummy variable interactions in the specifications with low-skilled and EITC interactions, discussed below.

less-skilled should be more affected by the EITC. We repeat these analyses for a sample of married women.

We then restrict the CPS ASEC data to match the data constraints in the SOI data, aggregating the CPS ASEC data to cells that vary at the state-year level. We estimate the following difference-in-difference-in-differences specification for the samples of single individuals with children, married individuals with children, and childless individuals.

$$Y_{st} = \alpha + \beta_1 EITC_{st} + \beta_2 EITC_{st} \cdot Lowskilled97_s + X_{st}\pi + \gamma_s + \lambda_t + \varepsilon_{st} \tag{3}$$

These variables are similar to before, although they now vary at the state-year level. However, $Lowskilled97$ is the share of low-skilled workers for each sample group in the baseline year, defined as having an education level no higher than a high school degree. This low-skilled measure is a proxy for the share of the state's population likely to be located near the phase-in region of the EITC budget constraint. The 1997 low-skilled baseline value is used to avoid potentially endogenous responses in state low-skilled populations, although we also show some results with the contemporaneous value.[23] In some specifications, we also include interactions with the low-skilled share with two or more children, to more clearly identify groups that are likely to respond strongly to EITCs.

In the specifications with the EITC and low-skilled share interactions, the EITC and low-skilled variables are demeaned before forming any interactions. So, in equation (3), β_1 represents the effect of a state EITC for states with an average low-skilled share in 1997. The predicted effects of state EITCs on employment and federal participation should be stronger in states with larger shares of the population potentially affected by a state EITC. This effect leads to a positive estimate of β_2. The same is true for equation (2), although in (2), the focus is on

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[23] The 1997 low-skilled share is an average of the low-skilled shares for 1997 and 1998, similar to the potentially eligible measure (see footnote 22).

those with and without children. One might interpret the main effect of the EITC in equations

(2) and (3) as the effect of the EITC on those without children, or the higher-skilled. However,

in the difference-in-difference-in-differences framework, the main effects may reflect other

shocks associated with EITC policy variation.   Hence, the focus is instead on the relative effects

of EITC variation on more- versus less-affected groups.

Federal EITC Participation

    We then evaluate the effect of state EITCs on our main outcome variable. We estimate

(3), but replace the employment rate with our corresponding EITC participation measure, federal

EITC filers per potentially eligible population. We estimate (3) separately for the sample groups

identified by the SOI data: single filers with children, married filers with children, and childless

filers. Estimates of our EITC participation regressions are weighted by the sample's population

of potentially eligible filers for each state-year cell.

    The main identifying assumption in order to estimate causal effect of state EITCs on

federal EITC participation is that conditional on state and year effects and economic and

demographic controls, the timing of the introduction and expansions in state supplemental EITCs

is not correlated with other omitted factors that may affect the federal EITC filing share among

more- versus less-affected groups. Our difference-in-difference-in-differences strategy requires

a weaker assumption than what would be required for a simpler difference-in-differences

analysis that only focuses on the more-affected workers, because the less-affected workers

provide a control for influences common to both groups. In addition, by exploring differences in

effects on EITC participation for groups for which predicted extensive-margin employment

effects vary, as well as other sources of predicted variation in the strength of the effect of state

EITCs on federal EITC participation, we can potentially do more to bolster a causal

interpretation of our evidence.

VI. Results

Preliminary Results: Examining the Effect of State EITCs on Employment

Table 3 reports estimates of versions of equation (2), estimating the effect of state EITCs on the employment rate of single and married women; we focus on women aged 21-44, as in Neumark & Wascher (2011). Column 1 reports the estimates for all single women, column 2 reports the estimates for the subsample of low-skilled single women, and column 3 reports the estimates for the subsample of single mothers. The employment and EITC policy data are on a scale of 0 to 1. So, focusing on column 1, introducing a 10% state EITC supplement is associated with a 1.5 percentage point increase in the employment of single mothers, relative to single women without children. However, while the magnitude of this estimate is similar to the existing literature, this estimate is statistically insignificant. When we restrict the sample to low-skilled single women, the estimated EITC coefficient is slightly larger in magnitude relative to the estimate in column 1, but it is still statistically insignificant. In column 3, for the subsample of single mothers, introducing a 10% state EITC is associated with a 2.6 percentage point increase in employment for low-skilled single mothers, relative to higher-skilled single mothers (significant at the 10% level). These estimates suggest that state EITCs increase the probability of employment for single women, particularly among low-skilled single mothers. However, our estimates are less precise than what is obtained from micro-data, not surprisingly.

The estimates in columns 4-5 of Table 3 suggest that state EITCs have a negative effect on the employment of married women with children, relative to married women without children. In column 4, a 10% EITC supplement reduces the probability of employment by 2.0 percentage points for married mothers relative to childless married women (significant at the 5%

level). In column 5, restricting the sample to low-skilled married women, the estimates are

qualitatively similar to column 4, but less precise. Finally, in column 6, we do not find a

negative effect on the relative probability of employment for low-skilled married mothers.

Taken together, these estimates suggest that the EITC creates a disincentive to work for married

mothers (perhaps allowing them to stay at home with their children), but the results are mixed.

The estimates in Table 3 generally replicate the qualitative results of the existing

literature, finding a positive employment response for single mothers, and a smaller negative

response for married mothers. Aggregating the data makes our estimates less precise, but the

estimates are generally consistent with the literature, especially for low-skilled single mothers.

Next, we report the estimates for the specifications that aggregate our data to the state-

year level (which matches the data constraints imposed by the SOI data). Table 4 reports the

estimates corresponding to equation (3), estimating the effect of state EITCs on the employment

rate of single individuals with children (columns 1-2), married individuals with children

(columns 3-4), and childless individuals (column 5).[24] Our difference-in-difference-in-

differences estimator is the coefficient on the state EITC and share low-skilled in 1997

interaction.[25] As stated previously, the EITC and share low-skilled variables are demeaned prior

to interacting, so the main EITC effect represents the state EITC effect evaluated at the sample

mean low-skilled share. Focusing on the sample of single individuals with children in column 1,

introducing a 10% state EITC supplement in a state with a low-skilled share that is 10 percentage

points above the sample mean is associated with a .27 percentage point increase in employment

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[24] Although not shown, we estimated the employment effects for subsamples of single and married
women, similar to the samples Table 3. Estimates were qualitatively similar (and slightly larger in
magnitude), but less precise with the smaller aggregated sample.

[25] Note that the 1997 baseline values are subsumed by the fixed state effects, and hence estimated
coefficients for these main effects do not appear in the table.

(but the effect is statistically insignificant). In column 2, we add interactions with the share low-skilled with two or more children to test whether the employment response is larger for this group. A 10% state EITC introduced in a state with a share of low-skilled individuals with 2+ children 10 percentage points above the sample mean is associated with a 1.7 percentage point increase in employment for single individuals with children (significant at the 1% level). These estimates suggest that the effect of state EITCs on single parent employment is larger in states with greater shares of the population most likely to be affected by a state EITC; specifically, low-skilled single individuals with two or more children.

Table 4 columns 3-4 report the employment estimates for the sample of married individuals with children. The estimated coefficients on the EITC and share low-skilled interactions are negative (and larger in magnitude for the share low-skilled with 2+ children), but statistically insignificant. Similarly, we find negative but statistically insignificant effects for childless individuals (column 5). Taken together, the estimates in Table 4 suggest that state EITCs have a positive effect on employment for single individuals with children, and the employment effects are stronger in states with greater shares of low-skilled single individuals with two or more children. Estimates suggest possible small negative employment effects for low-skilled married individuals with children and childless individuals, but the effects are statistically insignificant.

Overall, when we allow for additional sample variation in specification (2) (reported in Table 3), we generally replicate the existing literature's employment effects. State EITCs are associated with a positive employment response from single mothers, and this employment response is largely coming from low-skilled single mothers. For married individuals, the overall employment response is less clear, but usually slightly negative for married mothers with

children. However, the more we aggregate the data, the less precise our estimates get. These results highlight some of the potential limitations of using the aggregated SOI data. While our estimates still tend to support the existing EITC employment literature findings, aggregating our data to the level that is necessary to use the SOI data may obscure some of the effects of state EITCs on federal EITC participation that stem from extensive-margin labor supply effects.

Main Results: Examining the Effect of State EITCs on Federal EITC Participation

Table 5 reports the estimated effect of state EITCs on federal EITC participation for single filers with children. In columns 1-2, we report the estimates using the contemporaneous low-skilled share variable. In columns 3-4, we report estimates using the 1997 baseline share low-skilled value. We focus on the estimates using the 1997 baseline value because we are concerned that using the contemporaneous low-skilled variable may result in biased estimates because this variable may also capture the indirect effects of state EITCs on education or fertility.[26] In column 3, the positive estimated coefficient on the state EITC and share low-skilled interaction term suggests that the effect of state EITCs on federal EITC participation for single filers with children is larger in states with greater shares of low-skilled individuals. A 10% state EITC combined with a 10 percentage point increase in the share low-skilled is associated with an 8.91 percentage point increase in federal EITC filers per potentially eligible population (significant at the 10% level). In column 4, the estimate for the state EITC and share low-skilled with 2+ children interaction term is negative, but statistically insignificant with a

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[26] For example, Manoli and Turner (2015) find that EITC refunds received in the spring of the high school senior year have a positive effect on college enrollment. If state EITCs are positively related with education (and thus negatively related with our low-skilled share variable) and employment/participation, our estimates using the contemporaneous share low-skilled will be biased downwards. The literature on the effects of EITCs on fertility is less clear. As shown in Table 5, estimates using the contemporaneous low-skilled share are generally qualitatively similar to estimates using the 1997 baseline share, but they are smaller in magnitude, suggesting that they may be downward biased.

large standard error. Comparing columns 3 and 4, for the sample of single filers with children, the effect of state EITCs on federal EITC participation appears to be larger in states with greater shares of low-skilled individuals with children, but the effect does not appear to vary significantly by the share of low-skilled individuals with one versus two or more children.

These estimated magnitudes seem large, in comparison to the estimated employment effects in earlier tables (those in Table 4 are most comparable). Recall, however, that the effect of state EITCs on federal EITC participation need not stem only from labor supply effects. There can be other effects stemming from information and outreach about the EITC that accompanies state EITCs, and we would expect these effects to be concentrated on those most likely to be eligible for the EITC or on those that have the most to gain (the low-skilled, and those with children).

Table 6 reports the estimates of the effect of state EITCs on federal EITC participation for the sample of married filers with children. In the specifications using the baseline low-skilled shares, we find no significant effects of a state EITC on federal EITC participation. The estimated coefficients on the EITC and 1997 share low-skilled interactions are small and slightly negative, but the standard errors are large. Previously, we found some evidence of state EITCs encouraging married parents to leave employment. This does not necessarily mean that we should see an extensive EITC participation effect if the married couple already received the EITC before the state EITC expansion. However, these estimates certainly provide no indication of effects of state EITCs on the participation of married filers in the federal EITC.

Combined with the large positive estimates for single filers, the evidence could imply that much of the EITC participation effect is driven by increased employment, and also that the effects that arise independently of employment effects are stronger for single filers. Since the

single filers are likely to be the poorest and most disconnected from the labor market, perhaps with irregular and even some informal employment, stronger effects of state EITCs on federal EITC participation stemming from information, outreach, etc., are not implausible.

Finally, Table 7 reports the estimates of the effect of state EITCs on federal program participation for the sample of childless filers. Here we find no significant evidence of effects for the less-skilled, which suggests that any adverse general equilibrium effects are not leading to less-skilled childless individuals losing their EITC eligibility. However, this does not necessarily mean that childless individuals do not suffer from general equilibrium effects, since employers could be reducing their available hours (and therefore income) for childless individuals, and market wages may be falling, neither of which would lead to lower EITC participation.

VII. Examining the Effect of State EITC Refundability and State Filing Rules on Federal EITC Participation

To further gauge whether our estimated EITC effects are causal and do not reflect other influences, we explore whether the estimated effects of state EITCs on federal EITC participation are larger in states for which the EITC is refundable and for which state tax filing rules may differ from federal requirements so that a state EITC may make filing a federal return and claiming the federal EITC more likely.

We expect the effect of a state EITC to be larger in states where the EITC is fully refundable. Refundable credits are more valuable because if an eligible recipient's EITC credit exceeds their income tax liability, they can receive the difference. Furthermore, as described above, some states have different state filing requirements than the federal filing requirements, so some low-income individuals may be required to file a state income tax return, but not a federal return. In these states, a state EITC may have a larger impact on federal EITC

participation due to individuals being exposed to more information about the EITC program.

First, we restrict the sample to only include states that had a refundable EITC. There are nine states that offered non-fully refundable EITCs that we remove from our sample.[27] As a result, the number of observations drops from 612 to 504. Estimates are reported in Table 8, columns 1-4. Columns 1-2 report the estimates for the sample of single filers with children. Compared to the full sample in Table 5, columns 4-5, the estimated EITC effects on participation are larger for the subset of states with fully refundable EITCs. For example, the estimated interactive EITC and low-skilled effect increases from 8.91 to 9.84, the latter estimate significant at the 5% level. We again find the effect of a state EITC on participation is larger in states with greater shares of low-skilled individuals, but does not vary significantly by the share low-skilled with 1 versus 2+ children. Similarly, the estimates for the sample of married filers with children are larger in magnitude (compared to Table 6), albeit still statistically insignificant. These results are consistent with state EITCs having larger effects on federal EITC participation when the state EITC is fully refundable – which in the case of single filers means greater participation in the federal EITC.

Next, we restrict the sample to states that had different filing requirements than the federal filing requirements. These state rules are primarily related to having a lower state income filing requirement, but also include rules related to having different exemption allowances, state income modification rules, or having a state income tax liability. Among the states that offered an EITC, six states did not have filing requirements that differed from the federal filing

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[27] These states include Delaware, Illinois, Iowa, Maine, Maryland, North Carolina, Oregon, Rhode Island, and Virginia. Rhode Island offered a partially refundable EITC for some years. Four other states (Illinois, Iowa, Maryland, and Oregon) offered a non-refundable EITC initially, but later offered a refundable EITC.

requirements.[28] We excluded these six states from the sample, decreasing the number of

observations to 540. Estimates for this sample are reported in Table 8, columns 5-8.

Estimates for the sample of single filers with children and states with different filing

requirements are reported in Table 8, columns 5-6. Compared to Table 5, column 4, the

coefficient on the interaction between EITC and share low-skilled in 1997 is also larger in

magnitude (increasing from 8.91 to 10.06, both significant at the 10% level). Finally, columns 7-

8 report the estimates for the sample of married mothers, again showing no statistically

significant effects. Thus, there is evidence that states with different filing requirements have a

larger participation effect among single filers with children.

The differences between the estimates in Table 8 and the earlier estimates are not large,

but they are generally consistent with expectations about when state EITCs will have larger

effects on federal EITC participation. Moreover, the results for filing requirements (for single

filers) are particularly interesting because the larger effects are not likely to arise from extensive-

margin labor supply effects, but rather – we might surmise – from increased information about

the EITC stemming from state EITC programs.

VIII. Conclusion

Existing research on the federal EITC has linked the program to many positive labor

supply and welfare outcomes for low- to moderate-income families. At the state and local

government level, supplemental EITCs have become increasingly popular. These supplemental

EITCs enhance the federal credit by providing additional income support to lower-income

working families. While both individuals and states can benefit from increased participation in

the federal EITC through decreased poverty, economic benefits from increased spending of

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[28] These states include the District of Columbia, Minnesota, New Mexico, Oklahoma, Vermont, and
Virginia.

federal tax dollars, or other mechanisms, it has been previously unclear whether these state EITCs affect federal program participation.

In this paper, we explore whether state EITCs boost federal EITC participation. Our measure of EITC participation require us to use data from two sources. Specifically, we use data on tax filers from the IRS' Statistics of Income and demographic and employment data (used to estimate the population of potentially eligible filers) from the Current Population Survey Annual Social and Economic Supplement. To combine these datasets, we aggregate individual-level data to the state-year level.

Using these aggregated data, we re-examine estimates from the existing EITC and employment literature, estimating the effect of state EITCs on employment for single filers with children, married filers with children, and childless filers. Similar to existing research, we generally find that EITCs encourage work for single mothers and discourage work for married mothers, which should lead to increased federal EITC participation for these groups. However, when using the aggregated data, our estimates are less precise. This suggests that, owing to the data constraints imposed by the tax filer data, our EITC participation estimates may be imprecise.

In our analysis of the effects of state EITCs on federal EITC recipients per potential filers, we find that state EITCs increase federal program participation primarily for single individuals with children. Similar to the employment results, we find evidence that the effect of state EITCs depends on the state's population of low-skilled workers, a proxy for the share of the population that is likely to be affected by the state EITC. Our estimates imply that the effect of state EITCs on federal program participation is larger in states with greater shares of potentially affected populations. While the aggregated data may not clearly capture the effect of state

EITCs on federal program participation, our estimates point to positive increases in participation

for single filers with children.

References

Barrow, L. and McGranahan, L. (2000). The Effects of the Earned Income Tax Credit on the Seasonality of Household Expenditures. *National Tax Journal*, 53(4): 1211-1244.

Baughman, R. and Dickert-Conlin, S. (2009). The Earned Income Tax Credit and Fertility. *Journal of Population Economics*, 22(3): 537-63.

Bitler, M., Hoynes, H., and Kuka, E. (2015). Do In-Work Tax Credits Serve as a Safety Net? (*Forthcoming*) *Journal of Human Resources.*

Bhargava, S. and Manoli, D. (2015). Psychological Frictions and the Incomplete Take-Up of Social Benefits: Evidence from an IRS Field Experiment. *American Economic Review*, 105(11): 3489-3529.

Blank, R. (2002). Evaluating Welfare Reform in the United States. *Journal of Economic Literature*, 40(4): 1105-1166.

Chetty, R., Friedman, J. and Saez, E. (2013). Using Differences in Knowledge Across Neighborhoods to Uncover the Impacts of the EITC on Earnings. *American Economic Review,* 103(7): 2683-2721.

Currie, J. (2006). The Take-up of Social Benefits. *Poverty, The Distribution of Income, and Public Policy*, edited by A. Auerbach, D., Card., and Quigley, J., pp. 80-148, New York: Russel Sage.

Dahl, G., and Lochner, L. (2012). The Impact of Family Income on Child Achievement: Evidence from the Earned Income Tax Credit. *American Economic Review,* 102(5): 1927-56.

Dowd, T., and Horowitz, J. (2011) Income Mobility and the Earned Income Tax Credit: Short-Term Safety Net or Long-Term Income Support. *Public Finance Review*, 39(5): 619-652.

Dickert-Conlin, S., and Houser, S. (2002). EITC and Marriage. *National Tax Journal*, 55(1): 25-40.

Eissa, N. and Hoynes, H. (2004). Taxes and the Labor Market Participation of Married Couples: The Earned Income Tax Credit. *Journal of Public Economics,* 88(9-10): 1931-58.

Eissa, N. and Liebman, J. (1996). Labor Supply Response to the Earned Income Tax Credit. *The Quarterly Journal of Economics*, 111 (2): 605-637.

Evans, W. and Garthwaite, C. (2014). Giving Mom a Break: The Impact of Higher EITC Payments on Maternal Health. *American Economic Journal: Economic Policy*, 6(2): 258-90.

Flacke, T. and Wertheim, T. 2006. Delivering a Local EITC: Lessons from the San Francisco Working Families Credit. The Brookings Institution Survey Series, https://www.brookings.edu/wp-content/uploads/2016/06/20060516_SFWorks.pdf (viewed October 13, 2016).

Goodman-Bacon, A. and McGranahan, L. (2008). How Do EITC Recipients Spend Their Refunds? *Economic Perspectives* 32(2), 17-32.

Grogger, J. (2003). The Effects of Time Limits, the EITC, and Other Policy Changes on Welfare

Use, Work and Income Among Female-Headed Families. *The Review of Economics and Statistics*, 85(2): 394-408.

Guyton, J., Manoli, M., Schafer, B., and Sebastiani, M. (2016). Reminders and Recidivism: Evidence from Tax Filing & EITC Participation among Low-Income Nonfilers. NBER Working Paper No. 21904. Cambridge, MA: National Bureau of Economic Research.

Hirasuma, D., and Stinson, T. (2006). Earned Income Tax Credit Utilization by Welfare Recipients: A Case Study of Minnesota's Earned Income Program. *Journal of Policy Analysis and Management*, 26(1): 125-148.

Hotz, J. and Scholz, K. (2003). The Earned Income Tax Credit. *Means-Tested Transfer Programs in the United States.*

Hoynes, H., Miller, D., and Simon, D. (2015). Income, the Earned Income Tax Credit, and Infant Health. *American Economic Journal: Economic Policy*, 7(1): 172-211.

Hoynes, H., and Patel, A. (2015). Effective Policy for Reducing Inequality? The Earned Income Tax Credit and the Distribution of Income. NBER Working Paper No. 21340. Cambridge, MA: National Bureau of Economic Research.

Internal Revenue Service. (n.d.) State and Local Government EITC Programs. https://www.eitc.irs.gov/Tax-Preparer-Toolkit/stateandlocalEITC (viewed March 22, 2016).

Internal Revenue Service. (2016). Statistics for Tax Returns with EITC. https://www.eitc.irs.gov/EITC-Central/eitcstats (viewed October 18, 2016).

Leigh, A. (2010). Who Benefits from the Earned Income Tax Credit? Incidence Among Recipients, Coworkers, and Firms. *The B.E. Journal of Economic Analysis and Policy (Advances)*, 10(1): Article 45.

Manoli, D. and Turner, N. (2015). Cash-on-Hand & College Enrollment: Evidence from Population Tax Data and the Earned Income Tax Credit. NBER Working Paper No. 19836. Cambridge, MA: National Bureau of Economic Research.

Manoli, D. and Turner, N. (2016). Nudges and Learning: Evidence from Informational Interventions for Low-Income Taxpayers. NBER Working Paper No. 20718. Cambridge, MA: National Bureau of Economic Research.

Meyer, B. and Rosenbaum, D. (2001). Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers. *Quarterly Journal of Economics* 116(3): 1063-1114.

Neumark, D. and Wascher, W. (2001). Using the EITC to Help Poor Families: New Evidence and a Comparison with the Minimum Wage. *National Tax Journal*, 54(2):281- 317.

Neumark, D. and Wascher, W. (2011). Does a Higher Minimum Wage Enhance the Effectiveness of the Earned Income Tax Credit? *Industrial and Labor Relations Review* 64(4):712- 746.

Plueger, D. (2009). *Earned Income Tax Credit Participation Rate for Tax Year 2005.* Internal Revenue Service.

Scholz, J. (1994). The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness. *National Tax Journal* 47(1): 63-87.

Figure 1: Federal and State EITC Parameters, 2008

Earned Income Tax Credit, 2008
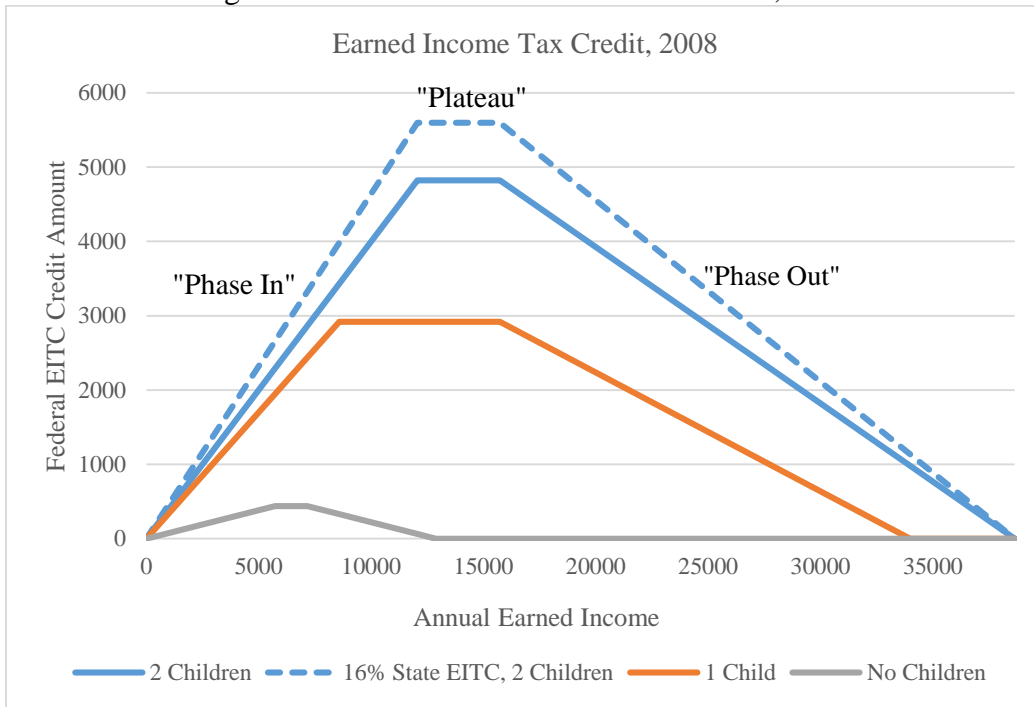
Note: The EITC schedule is based on parameters for single filers from the year 2008.

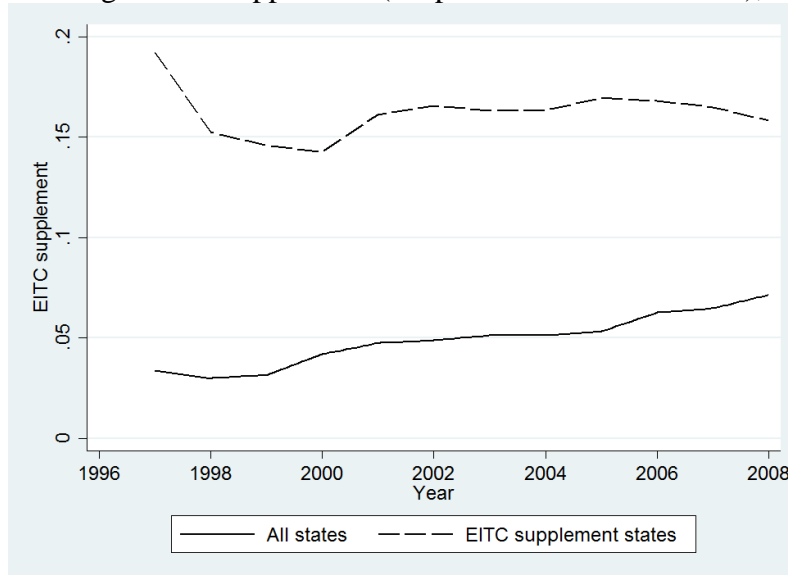Figure 2: Average EITC Supplement (Proportion of Federal EITC), 1997-2008

Figure 3: Average State EITC Supplement (Percentage of Federal Credit), by State and Year

Legend:

■	(30% +]
■	(20%, 30%]
■	(10%, 20%]
■	(0%, 10%]
□	[0%]
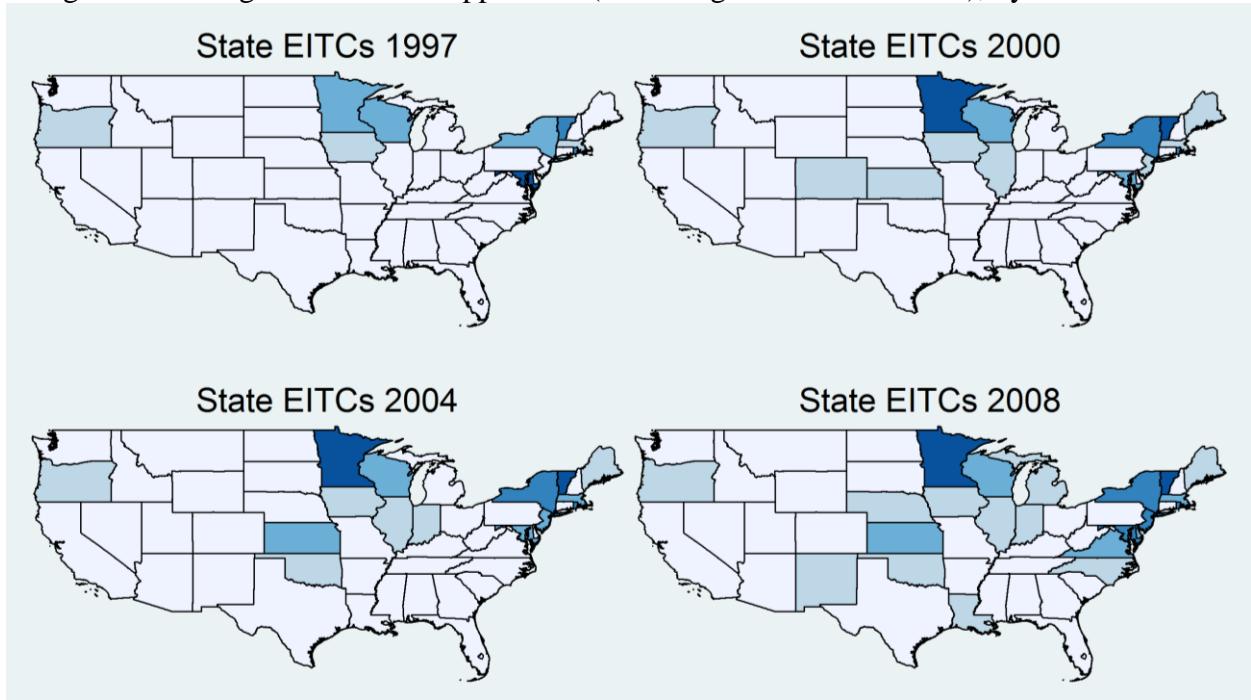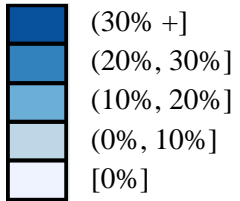
Figure 4: Number of States with EITCs, 1997-2008
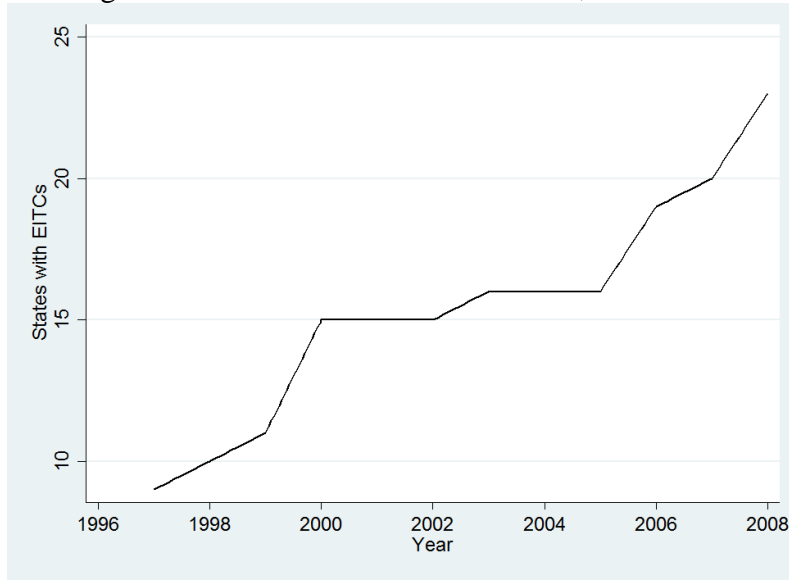
Figure 5: Federal EITC Filers per Potentially Eligible Population, 1997-2008
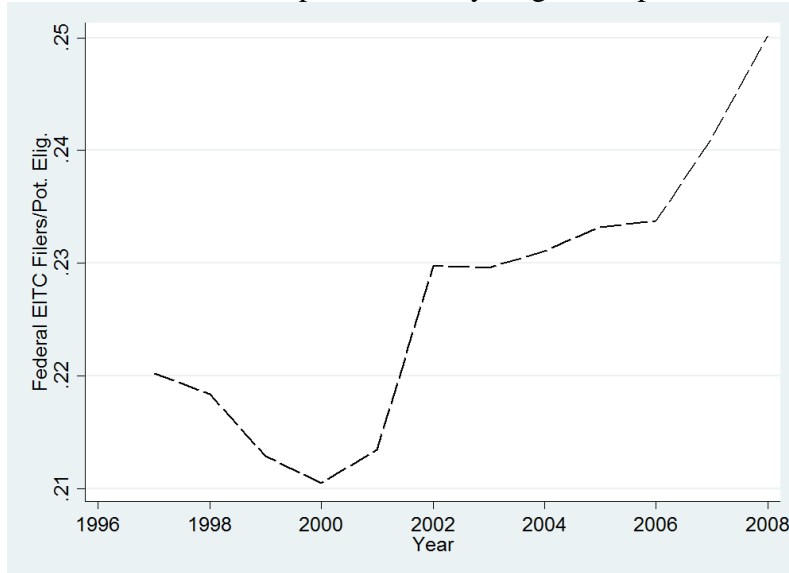
Notes: The variable "Federal EITC Filers per Potentially Eligible Population" is our measure of federal EITC participation. This variable is constructed using data on federal EITC filers from the IRS' SOI and data on potentially eligible filers from the CPS ASEC.

Figure 6: Federal and State EITCs and the Budget Line

"Phase Out"

"Plateau"

"Phase In"

Consumption (M)

Leisure Hours (L) = T - H

—— No EITC ········ Federal EITC — — + State EITC
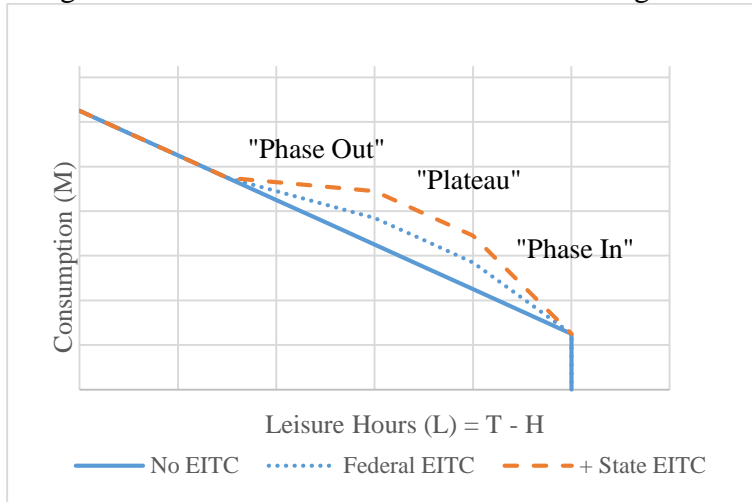
Figure 7: State EITC Induces Labor Market Entry

Consumption (M)

Leisure Hours (L) = T - H

—— No EITC ········ Federal EITC — — + State EITC
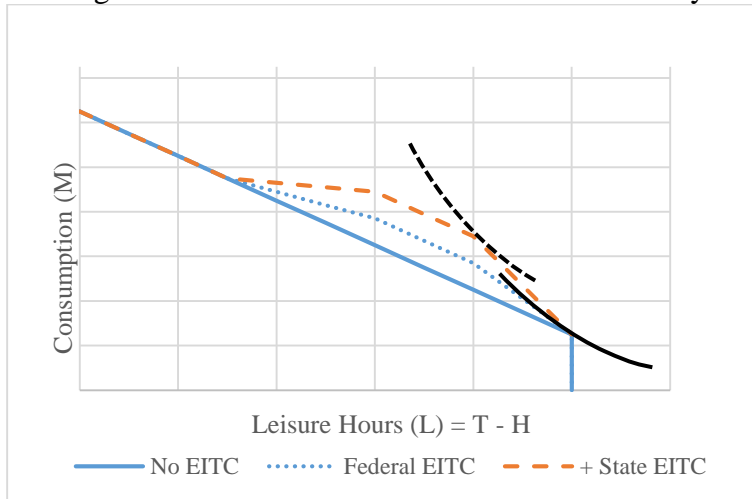
Figure 8: State EITC Decreases Hours Worked

Consumption (M)

Leisure Hours (L) = T - H

—— No EITC ········ Federal EITC — — + State EITC
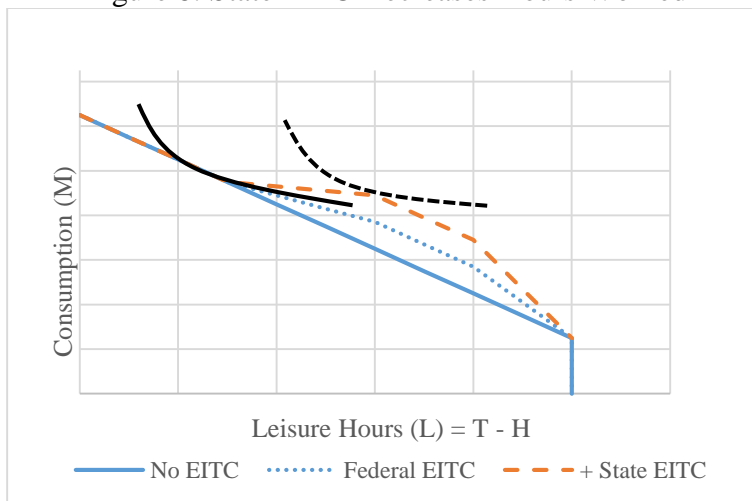
Table 1: Predicted Effects of State EITCs on Labor Supply and Federal EITC Participation

Group		Predicted Extensive Labor Supply Response	Predicted Federal EITC Participation Response
Single Filers with Children	Not Working Pre-State EITC	Increase in employment	Increase
	Pre-State EITC Income Above EITC Phase-Out Range	Decrease in hours	Increase
Married Filers with Children (Secondary Earner Responses)*	Not Working Pre-State EITC	1. Increase in employment if primary and secondary earners both not working pre-EITC. 2. Ambiguous effect on employment for the secondary earner if only the primary worker is working and the family already receives the EITC	1. Increase 2. No change (family already receives the federal EITC)
	Pre-State EITC Family Income Above EITC Phase-Out Range	Decrease in hours and/or employment.	Increase

*The predicted effects for primary earners in married households are the same as for single filers.

Table 2: Summary Statistics, 1997-2008

Tax Filers, Statistics of Income, 2008	2008		
Total EITC Recipients (Millions)	24.4		
Total Tax Filers (Millions)	131.4		
Total EITC Expenditures (Billions)	$50.50		
Share of Federal EITC Recipients, by Group	2008		
Single with Children	0.59		
Married with Children	0.19		
No Children	0.22		
Share of Federal EITC Expenditures, by Group	2008		
Single with Children	0.74		
Married with Children	0.23		
No Children	0.03		

Federal EITC Filers per Potentially Eligible Population	Mean	Obs	
Full Sample	0.219	612	
Single with Children	0.918	612	
Married with Children	0.154	612	
No Children	0.076	612	

State Policy Variables			
State EITC % Supplement	Mean	Min	Max
All States	0.048	0	0.5
EITC States	0.164	0.035	0.5

Notes: Data on tax filers and EITC recipients come from the SOI, 1997-2008. Data on the population of potentially eligible filers come from the CPS ASEC, 1997-2008. Statistics are weighted to either represent the population of tax filers or by the population of potentially eligible filers for each cell.

Table 3: Estimated State EITC Effects on Employment, Single and Married Women, Aged 21-44, 1997-2008

	(1)	(2)	(3)	(4)	(5)	(6)
	Single Women			Married Women		
VARIABLES	All	Low-skilled	Single Mothers	All	Low-skilled	Married Mothers
EITC	0.06	0.09	0.00	0.12*	0.24*	-0.17**
	(0.04)	(0.07)	(0.07)	(0.07)	(0.12)	(0.06)
EITC*Kids	0.15	0.18		-0.20**	-0.25	
	(0.11)	(0.15)		(0.09)	(0.20)	
EITC*Low-skilled			0.26*			0.16
			(0.13)			(0.14)
Low-skilled	-0.06***		-0.06***	-0.14***		-0.11***
	(0.01)		(0.01)	(0.01)		(0.04)
MW	0.04	0.06*	0.07*	0.00	0.04	-0.00
	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
Observations	4,816	2,448	3,592	4,896	2,448	3,672
R-squared	0.66	0.49	0.50	0.74	0.70	0.71

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Regressions use the CPS ASEC data on individuals, aggregated to cells that vary by state, year, kids (0, 1, 2, 3+), and skill level (no more than a high school degree). Regressions control for state unemployment rate, cell demographic measures including percent black, Hispanic, number of children and children under the age of six, marital status controls, and average age. State and year fixed effects are included. Kids-by-state and kids-by-year fixed effects are included in columns (1), (2), (4), and (5). Low-skilled-by-state and low-skilled-by-year fixed effects are including in columns (1), (3), (4), and (6). The EITC and share low-skilled variables are demeaned in the specifications with EITC*low skilled interactions. Estimates are weighted by the number of observations in each cell.

Table 4: Estimated State EITC Effects on Employment, 1997-2008

VARIABLES	(1) Single Individuals with Children, Aged 21-44	(2)	(3) Married Individuals with Children, Aged 21-44	(4)	(5) Childless Individuals, Aged 21-44
EITC	0.16***	0.08	-0.07	-0.08	-0.04
	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)
EITC*Share low-skilled in 1997	0.27	-0.89	-0.04	0.56	-0.80
	(1.01)	(1.24)	(0.47)	(0.53)	(0.64)
EITC*Share with 2+ children		-0.92		0.28	
		(0.56)		(0.38)	
EITC*Share low-skilled with 2+ children in 1997		1.67***		-0.95	
		(0.60)		(0.71)	
MW	0.03	0.03	-0.00	0.00	0.04**
	(0.03)	(0.04)	(0.01)	(0.01)	(0.02)
Observations	612	612	612	612	612
R-squared	0.68	0.68	0.86	0.86	0.76

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Regressions control for state unemployment rate, state minimum wage, and state demographic measures including percent black, Hispanic, female, average age, and marital status controls. Regressions for the samples of individuals with children also control for the number of children and young children shares. State and year fixed effects are also included. The EITC, state MW, and share low-skilled variables are demeaned in the specifications that include the variables' interactions. Estimates are weighted by the number of observations in each cell

Table 5: Estimated State EITC Effects on Federal EITC Participation, Single Filers with Children, 1997-2008

VARIABLES	(1)	(2)	(3)	(4)
	Y = EITC Filers/Potentially Eligible Population			
			Share low-skilled = 1997 baseline value	
EITC	0.04	-0.02	0.21	0.19
	(0.18)	(0.19)	(0.21)	(0.21)
Share Low-skilled	0.38*	0.02		
	(0.22)	(0.25)		
EITC*Share low-skilled	1.40	3.21	8.91*	10.29
	(2.02)	(3.98)	(4.47)	(7.92)
Share low-skilled with 2+ children		0.80***		
		(0.29)		
EITC*Share low-skilled with 2+ children		-3.44		-2.03
		(4.32)		(6.69)
EITC*Share with 2+ children		0.19		-0.44
		(1.48)		(1.26)
MW	-0.28	-0.22	-0.29*	-0.28
	(0.17)	(0.16)	(0.17)	(0.17)
Observations	612	612	612	612
R-squared	0.84	0.85	0.84	0.84

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Regressions control for annual state average unemployment rate, group demographic measures including percent black, Hispanic, female, and average age. Regressions also control for the number of children and the number of young children shares, as well as state and year fixed effects. The EITC, state MW, and share low-skilled variables are demeaned in the specifications that include the variables' interactions. Estimates are weighted by the number of potential filers.

Table 6: Estimated State EITC Effects on Federal EITC Participation, , Married Filers with Children, 1997-2008

VARIABLES	(1)	(2)	(3)	(4)
	Y = EITC Filers/Potentially Eligible Population			
			Share low-skilled = 1997 baseline value	
EITC	-0.04	-0.04	-0.06	-0.03
	(0.06)	(0.06)	(0.07)	(0.08)
Share Low-skilled	0.03	-0.06		
	(0.07)	(0.09)		
EITC*Share low-skilled	0.12	0.46	-0.14	-1.09
	(0.47)	(0.58)	(0.59)	(1.48)
Share low-skilled with 2+ children		0.13		
		(0.11)		
EITC*Share low-skilled with 2+ children		-0.50		1.66
		(1.18)		(2.40)
EITC*Share with 2+ children		0.06		-0.14
		(0.62)		(0.46)
MW	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Observations	612	612	612	612
R-squared	0.86	0.86	0.86	0.86

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Regressions control for annual state average unemployment rate, group demographic measures including percent black, Hispanic, female, and average age. Regressions also control for the number of children and the number of young children shares, as well as state and year fixed effects. The EITC, state MW, and share low-skilled variables are demeaned in the specifications that include the variables' interactions. Estimates are weighted by the number of potential filers.

Table 7: Estimated State EITC Effects on Federal EITC Participation, Childless Filers, 1997-2008

VARIABLES	(1)	(2) Share low-skilled = 1997 baseline value
EITC	0.01	0.03
	(0.02)	(0.02)
Share Low-skilled	0.05	
	(0.05)	
EITC*Share low-skilled	0.05	0.46
	(0.18)	(0.33)
MW	0.01	0.01
	(0.01)	(0.01)
Observations	612	612
R-squared	0.67	0.67

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Regressions control for annual state average unemployment rate, group demographic measures including percent black, Hispanic, female, marital status, and average age. Regressions also control for state and year fixed effects. The EITC, state MW, and share low-skilled variables are demeaned in the specifications that include the variables' interactions. Estimates are weighted by the number of potential filers.

Table 8: Estimated State EITC Effects on Federal EITC Participation, Refundable EITCs and State Filing Requirements, 1997-2008

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Refundable EITCs				Different State Filing Requirements		
	Single Filers with Children		Married Filers with Children		Single Filers with Children		Married Filers with Children	
EITC	0.23	0.23	-0.04	-0.06	0.34	0.31	0.03	0.02
	(0.24)	(0.30)	(0.07)	(0.09)	(0.29)	(0.25)	(0.07)	(0.08)
EITC*Share low-skilled in 1997	9.84**	9.65	-0.59	0.49	10.06*	14.81	0.60	2.23
	(4.78)	(9.08)	(0.78)	(1.78)	(5.96)	(9.07)	(0.67)	(1.94)
EITC*Share low-skilled with 2+ children in 1997		0.31		-1.76		-6.70		-2.43
		(9.78)		(2.76)		(7.51)		(2.54)
EITC*Share with 2+ children		-0.01		-0.12		-0.30		-0.30
		(1.35)		(0.51)		(1.67)		(0.54)
State MW	-0.41**	-0.41**	0.03	0.03	-0.34*	-0.33*	0.03	0.04
	(0.17)	(0.17)	(0.03)	(0.03)	(0.18)	(0.18)	(0.02)	(0.03)
Observations	504	504	504	504	540	540	540	540
R-squared	0.86	0.86	0.85	0.85	0.86	0.86	0.86	0.86

Notes: Standard errors are clustered at the state level, and reported in parentheses. Statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Regressions control for annual state average unemployment rate, group demographic measures including percent black, Hispanic, female, and average age. Regressions also control for the number of children and the number of young children shares, as well as state and year fixed effects. The EITC and share low-skilled variables are demeaned in the specifications with EITC*low skilled interactions. Estimates are weighted by the number of potential filers.