The Earned Income Tax Credit[1]

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1. Introduction

The Earned Income Tax Credit (EITC; sometimes referred to as the "Earned Income Credit," or EIC) is in many ways the most important means-tested transfer program in the United States. From modest beginnings in 1975, with $5.4 billion (in 2013 dollars) distributed to only 6 million recipients, it has since grown to be one of the largest and least controversial elements of the U.S. welfare state. In 2013, 26.7 million recipients shared $63 billion in total federal EITC expenditures. An additional $50 billion was disbursed through the Child Tax Credit, which has a similar structure. On top of this, in 2013 at least 25 states, along with the District of Columbia, New York City, and Montgomery County, Maryland, had their own EICs that supplemented the federal credit.

For all its size, the EITC is atypical when seen as a transfer program. It began life not as a carefully considered effort to alleviate poverty but as a legislative blocking maneuver, used by Senator Russell Long (Dem.-LA) to defuse proposals in the late 1960s and early 1970s for a Negative Income Tax (NIT; see Hotz and Scholz 2003). It has long received bipartisan support, with expansions authorized by both Democratic and Republican congresses and under each of the last five presidents. In recent years, calls for EITC expansions have been more likely to come from Republicans than from Democrats. House of Representatives Budget Committee Chair Paul Ryan's July 2014 discussion budget calls the EITC "[o]ne of the federal government's most effective anti-poverty programs," and proposes more than doubling the generosity of the EITC for childless workers. .

The EITC is also distinguished by its administration and incentives. It is administered by the Internal Revenue Service, not ordinarily thought of as an agency focused on fighting poverty or on distributing government spending. There are no caseworkers, though recipients often rely on for-profit tax preparers, who capture a non-trivial portion of EITC expenditures through fees they charge for preparing recipients' tax returns or for providing short-term loans against EITC proceeds. And where a common concern about means-tested transfers is that they will create incentives to masquerade as a person of limited means, thereby reducing labor supply, the EITC's primary incentive is to *increase* labor supply. Indeed, one concern about the EITC is that it will do too much to increase labor supply in the targeted population, allowing employers of low-skill workers to capture a portion of the credit through reduced wages.

Early research on the EITC (ably reviewed by Hotz and Scholz 2003) focused on understanding the program's labor supply effects in a static setting. Even by the time of Hotz and Scholz's review, however, the research literature was broadening to consider effects on marriage and fertility, skill formation, and consumption. Since their review, the literature has become more diffuse, encompassing a wide array of issues including the role of tax preparers; compliance and gaming of the tax code; information and so-called "behavioral" impacts on participation; the role of the EITC as an automatic stabilizer; and effects of the program on pre-tax wages, on recipients' health, and on children's long-run outcomes.

In Section 2, we review the history and rules of the EITC, along with its less-well-known sibling, the Child Tax Credit (CTC). We also discuss the goals of the

program, both as articulated by the politicians who have supported it and as can be inferred from the program's design, and we discuss comparable programs in other developed countries. Section 3 presents statistics on the growth, take-up, and distribution of the EITC.

Section 4 reviews a number of issues surrounding the program. We return to the rationale for the program's design. In the 1960s, a number of reformers advocated a Negative Income Tax (NIT), which would provide a universal basic income to those without other sources of income that would be taxed away as other income rose. In contrast to other anti-poverty programs with extremely high implicit tax rates at low earnings levels, the NIT was designed to have a modest marginal tax rate over a wide phase-out range. This was appealing both to the designers of the war on poverty and to conservatives who worried about disincentives created by traditional means tested antipoverty programs, and had supporters as diverse as Lyndon Johnson's Office of Economic Opportunity (though not Johnson himself), Richard Nixon, and Milton Friedman.

The EITC in some ways resembles an NIT, and is often thought of as a version of the latter. But it differs in important ways. We discuss reasons for that difference, and rationalizations of an EITC structure as an optimal response to deviations from the simple model that gave rise to the NIT. We also review the incentives created by the EITC and concerns about interactions with other programs and with cyclical variation.

Section 5 reviews the empirical literature regarding the EITC in the decade since Hotz and Scholz's review. As noted above, the early research on the EITC focused on the credit's labor supply effects. Around the time of the Hotz and Scholz paper, the literature settled on a rough consensus: The EITC's primary effects are on labor force participation, raising the participation rate of single mothers but reducing that of secondary earners in married couples. Effects on the intensity of work, conditional on participation, are much smaller, with most evidence deriving from effects on *reported* work intensity among the self employed, for whom actual intensity is difficult to verify. Indeed, the most compelling evidence for intensive-margin effects comes from the subset of the self employed who face negative marginal tax rates from the EITC and thus incentives to report *higher* earnings.

Research in the last decade has generally confirmed that consensus. Given this, our review focuses on other important questions concerning the EITC. We begin by examining evidence on participation in the program and compliance with credit rules, largely from administrative audit studies. This section also discusses the "Advance EIC" program that (until 2011) allowed recipients to receive their credits as increments to their paychecks throughout the year rather than as a lump sum tax refund. Takeup of this program – which could be seen as a free loan against a future credit – was extremely low. This is quite puzzling given the prevalence of "refund anticipation loans" that allow recipients to obtain their tax refunds immediately after filing their taxes – rather than a few weeks later – at a very high interest rate.

Next, we turn to studies of the effects of the credit on recipients. Rather than organize the results around potential perverse consequences of the credit – of which there are many, as with any program with complex eligibility requirements – we

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attempt to assess the overall impact of the credit on recipients' well-being. We discuss studies of effects on poverty; on consumption; on health; on family structure; and on children's outcomes.

Third, we consider the impact of the credit on the labor market. This encompasses the labor supply effects discussed earlier. We also consider the EITC's effect on pre-tax wages. Standard models of public economics emphasize that the economic incidence of taxes may differ from the statutory incidence, and a straightforward application of the canonical model implies that a portion of the EITC's incidence may be on the consumers of the subsidized product – labor – rather than on the producers. This fact was not prominent in early discussions of the EITC, but has been the subject of several studies in the last decade.

Finally, we discuss the EITC's role within a larger economy and constellation of transfer programs. We discuss work on interactions with other programs and with economic conditions.

Of particular interest, given the Great Recession of 2007-2009 and the subsequent period of extreme weakness in the labor market, is the potential role of the EITC as a counter-cyclical stabilizer. Going into the Great Recession, it was not clear what to expect from this. On the one hand, the EITC is available only to those who work, so it might not be expected to do much to help those who are involuntarily jobless. On the other hand, the credit is computed based on annual, calendar-year earnings, and many recipients are in the "phase-out" range where each additional dollar of earnings reduces their credit, while other workers earn too much to receive an EITC. Partial year unemployment might lead many of the former to receive larger credits, and the latter to be eligible where they would not have been had they worked the whole year. It is thus an empirical question whether the EITC will expand or contract in recessions. A few very recent studies have shed light on this. In general, the results are not encouraging – perhaps not surprisingly, as countercyclical stabilization has never been one of the primary goals of the program.

A second important interaction is with the minimum wage. The minimum wage and the EITC represent two quite different ways to help, in President Clinton's words, "make work pay," and the political debate often places them in opposition to each other. But it is not clear that the two should be seen as alternatives, as incidence considerations may create important complementarities between the two: Employers capture a portion of the EITC when the credit induces labor supply increases that drive down the market wage, and a binding minimum wage may help to limit this. In a neoclassical model, much depends on how a limited number of jobs are rationed among job-seekers. Under certain assumptions, the optimal policy combines a generous EITC with a high minimum wage.

Over the years, a number of proposals have been floated to modify the EITC in various ways. Many of these have been adopted – since 1991, the credit has been more generous for families with two or more children than for those with just one; since 2009 it has been more generous still for families with three or more children; a small credit was added in 1994 for families without children; and there has been repeated experimentation with the administration and enforcement of the credit. Section 6 discusses proposals for further reform, including those aimed at reducing

marriage penalties or at expanding the reach of the EITC to reach non-custodial parents or childless tax filers (who currently are eligible for a maximum credit of less than 10% that received by families with two or more children).

2. History, rules, and goals

2.1. History & goals

There have been a number of excellent studies of the history of the EITC, including Liebman (1998), Ventry (2000), and Moffitt (2003; 2010). Our brief discussion here cannot do it justice, and readers are referred to those studies – on which we draw heavily here – for more information.

The EITC grew out of the 1960s War on Poverty. As the welfare state grew, some – both supporters and critics – became concerned that a patchwork of means-tested anti-poverty programs would both leave important holes and create perverse incentives that discouraged work and encouraged permanent dependency. The latter issue is familiar from debates over the Aid for Families with Dependent Children (AFDC) program, since replaced by Temporary Aid for Needy Families (TANF): Because AFDC was aimed at non-workers and benefits were generally reduced dollar-for-dollar for any earnings, recipients contemplating work would quickly realize that the effective wage – the amount by which their incomes would rise for each hour worked – was zero.

One solution was to target the program carefully at populations – e.g., low-skill, single mothers – who could not be expected to work in any case (Akerlof 1978). But this could never be perfect, as even in the target population many might be capable of finding jobs, and there would surely be those who needed help despite not being in one of the defined target groups. Moreover, as programs multiplied to serve many different needy populations, often with overlapping eligibility criteria, the disincentive problem got worse: Recipients' effective tax schedules could be extremely complex, with many "cliffs" where marginal rates were well in excess of 100% and average tax rates, while generally lower, were nevertheless quite high. A recipient subject to such a schedule might reasonably decide to remain out of work and on the dole, even if she had other options.

One resolution to this problem might have been to try to improve program "tagging," while accepting that no tagging system would be perfect and that any means-tested program will have some distortionary effect. But this would have been inconsistent with a longstanding moral aversion in America to welfare dependency and commitment to work as the route out of poverty. President Johnson's 1964 Economic Report argued that while it would be possible to alleviate poverty solely through cash aid to the less fortunate, "this 'solution' would leave untouched most of the roots of poverty… It will be far better, even if more difficult, to equip and permit the poor of the Nation to produce and earn" their way out of poverty (Council of Economic Advisers, 1964).

This made it attractive to find an anti-poverty program that would limit work disincentives. Leading economists of the period supported a Negative Income Tax

(NIT) on this basis (see, e.g., Friedman, 1962; Lampman, 1965; Tobin, 1966). An NIT would have provided a baseline transfer to each eligible recipient, even if they didn't work, that would be reduced at less than a one-for-one rate with recipients' earnings. Because the effective tax rate under an NIT is less than 100%, recipients would see higher total incomes if they worked than if they didn't, and would thus face modest incentives to work, albeit weaker than in the absence of any program. Friedman (1962) was a prominent proponent of an NIT, advocating that it should be made universal and should replace the grab-bag of other anti-poverty programs.[2] President Nixon proposed an NIT, the Family Assistance Plan (FAP), in 1969.

But for many observers, even an NIT would not do enough to promote work. Indeed, it is not obvious that an NIT leads to more labor supply than does a traditional welfare program with a 100% phase-out rate: While the NIT effective tax rate is lower, this necessarily means that the phase-out range reaches higher into the income distribution, and the net effect is theoretically ambiguous. Moreover, the NIT unambiguously subsidizes *some* recipients who are choosing not to work (where traditional welfare at least had rules designed to require work from those who were able). Nixon's FAP proposal attempted to address this by requiring that adults in recipient families register at employment offices for work, training, or vocational rehabilitation, and also provided expanded day care and transportation services to make it easier to combine work with child-rearing. But this did not satisfy critics.

Senator Russell Long (D-LA) was a leader of the anti-FAP faction. In 1970 he proposed a "workfare" program as an alternative to FAP. Long's proposal would have provided a small guaranteed income to those judged unemployable (e.g., the blind, disabled, aged, and mothers of very young children). Those judged employable would have been eligible for work and training opportunities, wage subsidies, and even income maintenance payments when work was unavailable.

Long continued to attach versions of his proposal to various legislative vehicles. The 1972 iteration of his proposal closely resembled the modern EITC. Non-workers would have received nothing, but workers would have seen their earnings matched at a 10% rate, up to a maximum match of $400 ($2,229 in 2013 dollars) for a worker earning $4,000 per year. This match was explicitly designed to offset Social Security payroll taxes, then rising quickly and seen as quite regressive. (The subsidy rate, however, would have been substantially higher than the payroll tax rate, then under 6%.) For those with earnings above $4,000, the subsidy would have been taxed away at a 25% rate per additional dollar earned, reaching zero for earnings above $5,600. This was a much lower phase-out rate – and thus a longer phase-out range – than the 50% rate in most NIT proposals.

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[2] Another prominent proposal at the time was a "Guaranteed Annual Income," or GAI. To modern eyes, the distinction between a universal NIT and a GAI is not entirely clear. Although GAIs nominally did not phase out, someone would have to pay positive taxes to fund them, and the associated marginal tax rates do not appear economically different than a phase-out of the GAI. Nevertheless, NIT proponents – in particular Friedman, 1966 – were hostile to GAIs (Ventry 2000, footnote 17).

Long's work bonus was finally enacted in 1975, with his originally proposed subsidy rate of 10% and $400 maximum credit, but with a 10% phase-out rate that stretched the eligibility range up to an annual income of $8,000. Only families with children were eligible, and the program was initially authorized for only one year. Importantly, it was enacted as part of the Tax Reduction Act of 1975, largely concerned with tax cuts as a means of providing economic stimulus, not as part of a broad-based reform of the welfare state. Thus, where NIT proponents had advocated it as a replacement for other transfer programs, the EITC was enacted as a supplement to the existing constellation of programs.

Long's temporary program became permanent in 1978. That year, the maximum credit was increased to $500, the phase-out rate was increased slightly, and the credit schedule was modified to add a "plateau" range. Eligible families with earnings between $5,000 and $6,000 received the maximum credit of $500. The credit was reduced by 12.5 cents for every dollar of earnings above $6,000, finally disappearing when earnings reached $10,000. Another important change was the introduction of an "advance payment" option, whereby workers who signed up could receive their credit as small payments in each paycheck rather than as a lump sum tax refund in the spring. As we discuss below, however, this option was never much used, despite substantial marketing efforts in the 1990s, and was discontinued in 2011.

The program was largely stable between 1978 and 1986, but because it was not indexed to inflation the real value of the maximum credit fell by 18.2%. The Tax Reform Act of 1986 returned the credit to the same real value as in 1975 and provided for inflation indexing going forward. The phase-in rate was also increased, to 14%, while the phase-out rate was cut to its original level of 10%. The plateau was also dramatically widened in 1988, extending to $9,840. Because the phase-out rate was unchanged, this meant that credits were available all the way up to $18,576 in annual earnings ($36,579 in 2013 dollars).

The next big change came in 1990, when the credit was used to offset undesirable distributional consequences of other components of the 1990 tax bill. The credit was expanded by $646, phased in over three years; phase-in and phase-out rates were both increased; and a separate, more generous schedule was introduced for families with two or more children. The latter has been a permanent feature ever since. It has been complemented by a very small credit for families without children (with a maximum value that has never been larger than 15% of the one-child maximum credit), introduced in 1994, and an additional, even more generous schedule for families with three children or more, since 2009.

Another notable change came as part of the 1993 budget. President Clinton announced, in his first State of the Union address, a principle that full-time work at the minimum wage should pay enough to keep the family income, inclusive of the EITC and food stamps but net of payroll taxes, above the poverty line. To help achieve this, the EITC was increased sharply, particularly for families with two or more children. By 1996, the phase-in rate was 40% (34% for families with only one child), the maximum credit was over $3,500 ($2,150 for smaller families; these are $5,197 and $3,192, respectively, in 2013 dollars), and families with incomes as high as $28,500 ($42,315 in 2013 dollars) could receive credits.

Figure 1 illustrates the growth of the program. It shows the EITC schedule for a family with two qualifying children in 1979, 1993, and 2014, with both incomes and credits converted to real 2013 dollars. The real value of the credit was similar in 1993 as in 1979, though in 1993 the credit targeted families with lower real incomes: In 1979, the maximum credit was given to families with incomes between $21,700 and $26,100, and credits were available for family incomes as high as $43,500, while in 1993 the maximum credit was given to families with incomes between $12,500 and $19,700 and the credit phased out at an income of $37,200. By 2014, the real value of the credit had more than doubled, and the maximum income at which the credit could be received (though not the income ranges that qualified for the maximum credit) had returned to the 1979 level. One implication is that marginal tax rates for most recipients – the slope of the sides of the schedule trapezoids – have roughly doubled since 1979, becoming more negative for those with very low incomes and more positive for those with higher incomes.

Figure 2 provides another look at the program's history. It shows that the 1994 expansion was by far the most dramatic in the program's history, with the only other substantial expansions occurring in 1996 and, for families with three or more children, in 2009.

Not visible in the figure is another change that took place beginning in 2002. Until then, the credit schedule had depended only on the number of qualifying children and not on the number of adults in the home. After 2002, the credit schedule was extended to higher levels of earnings for married couples filing jointly than for head-of-household (single parent) filers. The income levels at which the credit begins to phase out and then at which it disappears were $1,000 higher for married couples than for single parents in 2002-4, $2,000 higher in 2005-7, $3,000 higher in 2008, and $5,000 higher in 2009, rising with inflation since then.

The Taxpayer Relief Act of 1997 introduced a new program, the Child Tax Credit (CTC). As discussed below, it is structurally similar to the EITC, though it targets higher-income families: As of 2013, it is available to families with incomes as high as $130,000, with maximum credits available at incomes as high as $110,000. The maximum credit has been $1,000 (in nominal dollars) since 2003. Although this credit is only a fraction of the EITC, total expenditures are comparable ($55 billion for the CTC and $64 billion for the EITC in 2012), due to the broader reach of the CTC.

In contrast to the EITC, the CTC is not fully refundable. For many recipients, this is not relevant – they earn enough to face meaningful income tax liabilities, and the CTC merely offsets that. But for lower-income families affected by the EITC, income tax liabilities are low and the refundability of the credit is key to its value. The refundable portion of the CTC is known as the Additional Child Tax Credit, and is limited to 15% of earned income less a fixed threshold. Until 2009 this threshold was set at $12,550, preventing most low income families from receiving meaningful refunds via the CTC. But the 2009 American Recovery and Reinvestment Act (ARRA) reduced the threshold to $3,000. This allowed more taxpayers to claim the additional child tax credit and increased the amount of refundable credits. The ARRA provision was originally set to expire in 2011, but the scheduled expiration date was extended first to 2012 and then to 2017.

2.2. Rules

2.2.1. Eligibility

Eligibility for the EITC is based on a number of factors. The first is the presence of "qualifying" children in the household. A qualifying child must be younger than nineteen (24 if a full-time student, or any age if totally disabled); the child, grandchild, or foster child of the tax filer; and a resident of the household for at least half of the tax year. Since 1994, families without qualifying children can be eligible for the credit, but the no-child credit is much less generous than that for families with qualifying children.

Note that a child can be a qualifying child for the purposes of the EITC but not for the dependent exemption, and vice versa, as the two impose different requirements relating to residency and support. In particular, non-custodial parents are generally ineligible for the EITC, even if they provide substantial support to the child. Some states have experimented with non-custodial parent credits; we discuss these in Section 6.

The second eligibility requirement is earned income. To qualify for a non-zero credit, this must be positive, and must be below a threshold that varies with family size (and, recently, with filing status), but in 2014 is $48,378 per year for a family of two children with two parents filing jointly. Moreover, adjusted gross income (AGI) must be below the same threshold. Finally, total income from interest, rent, dividends, capital gains, and other "passive" sources must be below $3,300. Importantly, the relevant income measures are those for the tax filing unit. Thus, for married couples both spouses' earnings count toward the threshold.

2.2.2. Claiming

Obtaining the credit requires filing a tax return. Many families must do so anyway, so for these the claiming requirement is not burdensome. Some EITC recipients, however, might not otherwise be required to file returns.

For families with positive tax liabilities from the regular income tax or the self employment tax, the EITC is used to offset these liabilities. When the EITC exceeds other liabilities, however, it is refundable. Over 85% of EITC claimants receive all or part of their credit as a refund, and a similar proportion of credit dollars are refunded.

Because the EITC is treated as a tax refund, just as if an individual has had too many taxes withheld over the course of the year, it is distributed as a lump sum following the filing of the family's tax return. Not surprisingly, EITC recipients tend to file their returns earlier than do other families, and the majority of EITC refunds are distributed in February.

A substantial majority of EITC claimants use third-party tax preparers, such as H&R Block, to file their tax returns (Chetty, Friedman, and Saez, 2013; Wancheck and Greenstein, 2011). Indeed, the EITC has supported rapid growth in the tax preparation business in low-income neighborhoods. These businesses typically charge modest fees for preparing the return, but bring in substantial revenues through "refund anticipation loans." The IRS pays tax refunds within a few weeks of

filing a return, but individuals who want their money sooner can borrow against their refunds from the tax preparer (or from an affiliated financial institution), typically at usurious rates.

From 1979 to 2010, the IRS offered an alternative mechanism for receiving the credit, known as the "Advance EIC." Recipients who expected to receive an EITC could sign up for the Advance EIC program by submitting an IRS form to their employer. Once this form was filed, the EITC would appear as credits (negative deductions) on the worker's weekly, biweekly, or monthly paycheck. The Advance EIC thus treated the EITC like any other form of taxes, adjusting the withholding rate to match the expected end-of-year tax liability; the only exception was that the required withholding rate was generally negative, yielding supplements to each paycheck. As with other withholding, it amounted to an interest-free loan against the eventual return. The Advance EIC was never used by more than a few percent of EITC recipients, and was eliminated beginning in tax year 2011 (http://www.gao.gov/highlights/d071110high.pdf).

2.2.3. Credit schedules

Table 1 shows the EITC schedule over time, for selected years. As illustrated in Figure 1, the schedule consists of three segments: A "phase-in" range, over which the credit increases in proportion to the amount earned (so the marginal tax rate, equal to minus one times the slope of the schedule, is negative); a "plateau," where the maximum credit is paid (so the marginal tax rate is zero); and a "phase-out" range, where the credit is reduced in proportion to the difference between earnings and the end of the plateau range (so the marginal tax rate is positive). The phase-out range ends at the point where the credit is reduced to zero; families with earnings above that amount are not eligible for the credit.

The schedule is slightly more complex for families with unearned income. When earnings place the family in the plateau or phase-out ranges and adjusted gross income (including unearned income) exceeds earned income, the credit is based on the latter.

The Child Tax Credit (CTC) has a similar form. Eligibility for the CTC depends on only adjusted gross income (AGI), not on earnings, and the credit is not refundable unless AGI exceeds $3,000. Beyond that, however, the schedule has a similar shape to that of the EITC. It reaches much farther into the income distribution: Where families with earnings above $51,567 are ineligible for the EITC, three-children, two-parent families can receive the CTC with incomes as high as $165,000. Figure 3 shows the combined EITC and refundable CTC credits by family type and income in 2013.

2.2.4. Interactions

The EITC's administration through the tax code, as a function of earned income, means that EITC eligibility is not directly affected by participation in most other programs (except insofar as that participation affects market earnings). One exception is unemployment insurance benefits: These are not counted as earned income but do count toward adjusted gross income (AGI), so can reduce a family's credit or even make a family ineligible for the credit.

Most federal means-tested benefit programs do not count EITC refunds as income, even when (before 2011) the refund is received as advance EITC payments throughout the year. Programs in this category include Supplemental Security Income (SSI), Medicaid, the Supplemental Nutritional Assistance Program (SNAP, formerly known as food stamps), Veteran's benefits, Head Start, and new benefits under the Affordable Care Act. However, individual states decide whether the EITC counts as income in their TANF programs (only Connecticut does, and only for advance EITC), LIHEAP, child care subsidies, and all state-funded means-tested benefit programs.

Even when the EITC payment does not count as income, it can still count against asset limits if it is saved rather than spent immediately. In SSI, neither EITC and CTC payments are counted unless they are saved for nine months; in the SNAP program, saved EITC payments are typically not counted for twelve months. Following the 2008 Farm Bill, tax refunds can be deposited in qualified retirement plans and education savings accounts and not count as assets in determining SNAP eligibility. Effectively, then, EITC recipients are encouraged either to deposit their refunds in tax-protected accounts – perhaps unlikely for low-income families – or to spend them quickly, rather than to set them aside as short- or medium-term savings against unanticipated shocks.

Multiple program participation among EITC recipients, especially common since the recent recession (Nichols and Zedlewski 2011), is important insofar as it can dramatically change marginal incentives, and change our view of how effectively the EITC transfers resources or provides insurance against earnings shocks. Maag et al. (2012) calculate marginal effective tax rates (due both to taxes and benefit reductions) and demonstrate that the impact of the negative tax rate in the federal EITC's phase-in is often greatly affected by participation in other programs. For example, in Connecticut, moving from zero gross earnings to poverty-level gross earnings incurs an overall effective tax of 2.0 percent for a single parent of two who has Medicaid but negative 10 percent for a single parent of two without Medicaid (but ACA credits). See also Hanson and Andrews (2009), who describe how effective tax rates on earnings due to benefit reductions depend on complex interactions across SNAP, SSI, and TANF, and on state policy choices regarding each of these programs. Figure 4 reproduces the overall effective tax rates Maag et al. (2012) calculate for a single parent of two participating in all entitlement programs, averaging across states.

2.2.5. State EICs

A number of states have incorporated Earned Income Credits into their own income tax systems. Typically, these are refundable credits equal to a specified percentage of the tax filer's federal EITC. As of 2014, 24 states and the District of Columbia had credits, ranging from four percent (for a family with one child in Wisconsin) to forty percent (in the District of Columbia) of the federal credit (IRS 2014). These credits are listed in Table 2. New York City and Montgomery County, Maryland, have also adopted sub-state credits.

New York State and Washington DC have also introduced EITCs for non-custodial parents, who are not generally eligible for the federal credit.

Because state and local credits are (nearly always) specified as shares of the federal credit, recipients in those states face even more negative marginal tax rates over the phase-in portion of the schedule and even larger positive rates over the phase-out than do recipients in states without credits.

2.2.6. *Enforcement and noncompliance*

In theory, the EITC is much easier to enforce than are other transfer programs, simply because the IRS receives so much third-party reporting of relevant information (e.g., earnings). Noncompliance issues with the EITC center around two types of information that are *not* covered by these information returns: Claiming of the credit based on non-qualifying children, and self-employment income.

A qualifying child for the EITC must be younger than 19 (or 24, if a full-time student) or permanently and totally disabled, and must live with the taxpayer for more than half the year. The residency criterion differs from that used elsewhere in the tax code; for example, dependent exemptions are based on which parent provided financial support and not on where the child resides. As we discuss in Section 5.1, studies of EITC noncompliance indicate that much of it derives from cases where a parent claims the credit based on a child who does not meet the residency test. Another substantial portion appears to derive from the *over-*statement of income among the self-employed, who gain more in additional EITC by claiming income at the top of the phase-in region than they lose through other tax obligations.

As a result of noncompliance, a substantial amount of refundable credits are issued in error each year, which has led Congress to demand ever-increasing scrutiny of EITC recipients. However, the rates of noncompliance and amounts of dollars paid in error are small relative to other segments of taxpayers. A reduction in tax liability due to misreporting receipts or expenses among a high-income self-employed person who is well above the phase-out of the EITC will usually dwarf the increase in a refundable credit amount issued to a low-income taxpayer who overreports net earnings from self-employment. (IRS 2006). However, the reduction in tax liability is less salient to some Congressional observers than is an increase in payment, though the impact of both on the federal budget is identical.

3. **Program statistics**

The number of EITC recipients and the aggregate size of EITC outlays have both grown sharply in size in 1975. Figure 5 shows the growth in the number of recipients and in total real EITC payments. There are notable spikes in 1988, 1994-5, and 2009, each due to shifts in the population eligible and changes in program rules. Comparable figures for the CTC are shown as well. Here, we see a sharp increase following 2003 tax law changes but relatively stable outlays since 2004.

Figures 6 and 7 show the distribution of EITC and CTC recipient returns by income level. Clearly, the EITC pays its benefits to substantially lower-income tax units on average. Most EITC recipients have family incomes under $20,000, though the dollar-value-weighted distribution is somewhat higher as the very lowest income families are eligible for only small credits. By contrast, most CTC recipients

and payments have family incomes above this point, with substantial payments going to families with incomes above $100,000.

Because the EITC targets lower-income tax units, the number of EITC recipients ,might be expected to increase during recessions as incomes fall in real terms, though if larger numbers of tax units fall below the filing threshold or have earnings fall to zero, then numbers of recipients can fall rather than rise. In contrast, because the CTC tends to accrue to middle-income tax units, it tends to respond less to downturns, as some middle-income tax units fall to lower incomes but some higher-income tax units become eligible for the CTC. Cyclical properties of the EITC are further discussed in Sections 4.6 and 5.4.

Most evidence on the demographic characteristics of EITC recipients comes from the Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS). Table 3 shows the distribution of tax units across EITC schedule ranges in the 2012 CPS ASEC. Not surprisingly, families without children are overwhelmingly unlikely to receive any EITC, and when they do the average amounts are small. Larger families are both more likely to receive the credit and receive larger credits when they do. Families with non-white heads, those with less education, and those of child-rearing age are all overrepresented among EITC recipients. Table 4 uses the same data to compare the characteristics of families and households that do and do not receive the EITC. Note that in many cases families and households contain more than one tax filing unit, and in some cases more than one unit receiving the EITC. In some cases this may reflect the incentive that the EITC can create to cohabit rather than marry.

Given that the majority of EITC payments go to families with children, it makes sense to compare the characteristics of children whose families receive the EITC to those in ineligible families. Table 5 compares the characteristics of children in households that do and do not receive the EITC. Children from EITC-eligible families are more likely than children in ineligible families to be Black or Hispanic, much more likely to live with an unmarried mother, and tend to have mothers with less education. Other research (Dahl and Lochner 2012; Maxfield 2013) finds that their mothers tend to have lower cognitive test scores as well.

An important caveat to these data is that the CPS does not survey respondents about their EITC receipt but rather imputes it based on the family structure and self-reported annual income. This means that the EITC may be assigned to families that do not claim the credit; many families' eligibility may also be misclassified as the CPS does not contain enough information to fully determine whether children qualify. Table 6 presents comparisons of EITC take-up in the CPS sample to IRS data. While the CPS appears to do a reasonable job of capturing EITC claiming among childless families, it misses as much as half of the returns and credit values going to families with children. It is unclear whether the dramatic discrepancy reflects misclassification of families in the CPS or over-claiming of the

credit with the IRS.[3]

4. Review of issues surrounding the program

4.1. Labor supply incentives

As noted above, the main basis for the EITC's popularity among politicians and policymakers is that it does not have the severe distortionary effects on recipients' labor supply that occur with more traditional transfer programs. But disincentives to work cannot be avoided in means tested transfers, and the incentives created by the EITC are complex. The EITC encourages labor force participation among single parents, but discourages it for many would-be secondary earners in married couples. Among workers, some face incentives to work more, while many more face incentives to work less. We consider each of these incentives in turn.[4]

We begin with the case of a single parent faced with a decision whether to work at all. If she does not work, she will not receive an EITC (though she may receive TANF, food stamps, or other transfers). If she does, and if her earnings are less than $38,511 per year (for a one-child family), she will receive a positive EITC. This will offset other taxes if any are owed, and will be refunded if they are not. Clearly, the EITC tilts this decision in favor of working.

But for married couples the incentives can go the other direction. Consider a sequential labor supply decision, where one spouse chooses his/her labor supply before the other. If the primary earner will earn enough to take the family out of the phase-in range on his own, then the second mover can only reduce the family's credit by working, and faces an incentive to remain out of the labor force.

At the intensive margin, too, incentives depend on where in the schedule the family falls. Families on the phase-in range face incentives to increase their hours of work, while those in the phase-out (and even some who would earn slightly above the eligibility threshold in the absence of the credit) are encouraged to work less in order to obtain a larger EITC payment.

As this makes clear, there is really only one unambiguous pro-work incentive in the EITC: Single parents are encouraged to work at least a bit each year rather than to remain out of the labor force. This is perhaps not surprising, as it is exactly this intended response that motivated the design of the program. But other groups face much more complex incentives.

This discussion focuses on static labor supply decisions. There are interesting dynamic effects as well, deriving from the EITC's dependence on

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[3] In future drafts of this paper, we hope to explore these discrepancies further via the use of matched CPS-IRS data, but this analysis was not ready in time for this draft.

[4] Our discussion is informal. See Hotz and Scholz (2003) for a more formal treatment.

calendar year earnings. Sole earners face incentives to spread their work out across as many calendar years as possible, while secondary earners can face an opposite incentive to alternate years in and out of the labor force rather than working part time but consistently. Moreover, if individuals are not able to perfectly forecast their earnings within a calendar year, they can face incentives either to raise labor supply during the autumn (if they are still in the phase-in range) or to reduce it (if they have reached the phase-out).

In the longer run, the EITC – like any means-tested transfer – reduces the return to human capital. This could reduce educational investment. It can also reduce labor supply among younger workers, insofar as an important part of the return to work is via the accumulation of experience that will lead to higher wages later in life (Heckman, Lochner, and Cossa 2003).

The incentives facing the self-employed are worth a separate note. These mostly relate to reporting – where traditional workers' earnings are reported to the IRS by the employer, self-employed workers must report their own earnings, and often must make arbitrary accounting decisions about how to allocate business income between earnings and profits. Those in the phase-out range of the EITC schedule, and even some with earnings above the end of that range, can face an incentive to hide some earnings in order to maximize their credit. Even more perverse, those in the phase-in range face incentives to *inflate* their reported earnings. (This is because the EITC phase-in rate is higher, in absolute value, than the additional payroll taxes that would need to be paid on the additional reported earnings.) What enforcement mechanisms there are are all aimed at detecting underreporting of income, not overreporting, so this type of evasion is very difficult to detect.

4.2. Why structure a program this way?

As the above discussion of the EITC's history makes clear, there has long been a tension among the program's various goals. Of course, one goal of all means-tested transfer programs is to transfer income to the poor. But why the particular structure of the EITC? Specifically, why use negative marginal tax rates on the first dollar of earnings to distort labor supply decisions? Why base the schedule on total income of the tax filing unit? And why such a comparatively stingy schedule for families without children? These design choices have a number of potential rationalizations.

It is important here to note that the EITC overlaps with many other programs that themselves create non-zero effective tax rates. Thus, the negative marginal rates (for those in the phase-in range) and average rates (for primary earners) associated with the EITC schedule may serve in large part to offset positive tax rates created by other programs (Kaplow 2006), and in so doing may help to "make work pay." Indeed, some discussions of the EITC treat the phase-in MTR as designed to offset payroll taxes, though in the modern program the EITC phase-in subsidy is much larger than any plausible measure of the payroll tax burden.

Another potential explanation for the use of negative MTRs in the EITC is that this helps to offset the negative labor supply effects that are inherent in means-

tested transfers that rely on realized earnings to define means. Saez (2002) argues that when labor supply decisions are made primarily along the intensive margin (about how many hours to work per year) the optimal transfer policy resembles a Negative Income Tax, with a base transfer that is taxed away as earnings rise above zero, but that when the extensive margin (about whether to work at all) labor supply elasticity is large then an EITC-like structure can be optimal.[5] A key assumption in Saez's (2002) model is that labor supply is the binding constraint. Ongoing work by Kory Kroft, Kavan Kucko, Etienne Lehmann, and Johannes Schmieder (2014) shows that when the labor market is slack the optimal transfer schedule is more like the NIT and less like the EITC. A related point is that Saez (2002) assumes that pre-tax wages are invariant to the tax schedule. Rothstein (2010) notes that the EITC's effect on wages partially offsets its redistributive intent, while the NIT's ability to redistribute is magnified by its wage effects. We discuss this issue in Section 4.3.

In any case, it is not clear that optimal tax arguments can fully explain the EITC's structure. It seems that at least some supporters of the program have an explicit goal of encouraging more work than would obtain even without distortions. Evidently, (some) policymakers place a lower social welfare weight on the leisure of single mothers than do the women themselves. This explanation could rationalize the evident aversion to subsidizing voluntary non-employment across a variety of programs. The question then arises: Why might policymakers' social welfare functions have this feature? One potential source is paternalism – a view that poor women are not able to maximize their own utilities. Another potential explanation, implicit in many discussions but rarely voiced explicitly, is that policy is attempting to force women to internalize a positive externality associated with their labor (Acs and Toder 2007).

The obvious externality is on the women's children. Low incomes may have negative effects on children, who bear no responsibility for their parents' economic circumstances. But this type of argument would be most directly addressed via cash welfare programs.[6] A more compelling argument for the EITC needs to tie the externality to the work decision itself. It is plausible that parents do not fully internalize the long-term negative consequences for their children of modeling low work attachment. If so, incentivizing work among low-income parents may protect some children from coming to believe that nonparticipation in the labor market is a viable life course. This notion of parents modeling good work behavior for children played a central role in Bill Clinton's narrative around "ending welfare as we know

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[5] See also Blundell (2006) and Blundell, Brewer, Haan, and Shephard (2009).

[6] Many higher-income mothers appear to believe that a stay-at-home parent is better for young children than is paid child care. If the same is true for low-income families, this can be seen as a negative externality associated with maternal employment, and constitutes an affirmative argument for unconditional over conditional transfers. But there is at least some evidence that paid child care is beneficial for low-income children (see, e.g., Deming 2009; Puma et al., 2012)

it" and in expanding the EITC. Recent state-level innovations in non-custodial benefits (discussed in Section 6) are also consistent with this view.

A second set of questions about the EITC relate to its unusual placement within the tax code, rather than in traditional social welfare agencies. This, too, has a number of potential explanations. First, it symbolically links the credit to participation in the formal economy, likely produces smaller stigma for recipients than do welfare programs. Second, it provides a simple means of administering the credit without the large overhead of caseworkers and other staff needed for traditional means-tested transfers. Third, there is a political advantage to implementing a transfer through the tax code: Tax credits are "off budget," and don't count toward Congressional expenditure caps.

Administration of the EITC through the tax system does impose limitations, however: Because income taxation is at the family level in the United States, so is EITC eligibility. This creates some perverse incentives. In particular, as we discuss in Section 5.3, many potential secondary earners face positive (and sometimes large) marginal tax rates from the first dollar they earn, simply because their spouses' earnings are enough to put the family in the EITC phase-out range. But there is no easily administrable alternative within the U.S. family-based tax code.

4.3. Incidence

Labor supply impacts are only the beginning of the EITC's effect in the labor market. Standard public economic theory implies that policies that affect labor supply decisions will have follow-on effects on other labor market outcomes, in particular market wages. In particular, a negative effective tax rate that encourages increased labor force participation will lead to a decline in pre-tax wages. This implies that a portion of the money spent on the EITC will be captured by employers of EITC recipients and of other workers competing in the same labor market as the EITC recipients. We develop this idea in the simplest possible case; readers are referred to Rothstein (2010) and Fullerton and Metcalf (2002) for more elaborate models.

In general, non-linear income taxes make it difficult to define a single hourly or annual wage. We focus on a simple model with a single, linear tax that introduces a fixed wedge between the pre-tax wage w and the post-tax wage ω: $\omega = w(1-\tau)$. Given the evidence discussed below that the primary labor supply effect of the EITC is for single mothers on the extensive margin, it is useful to think of individual labor supply decisions as binary – participate or not – and thus to think of τ as the average tax rate on earnings, which is negative under the EITC.

The EITC, like other personal income taxes, is levied on the worker rather than on the employer. Thus, labor supply should depend on ω. A simple representation of total labor supply is:

$$L^S = \alpha \, \omega^\sigma, \tag{1}$$

where $\sigma \geq 0$ represents the elasticity of labor supply. Labor demand depends on the pre-tax wage that is actually paid by the employer, with elasticity $\rho < 0$:

$$L^D = \beta \, w^\rho. \tag{2}$$

So long as the labor supply elasticity is positive and demand is less than fully elastic, a portion of the subsidy $|w\tau|$ will accrue to employers through reduced pre-tax wages. Given the simple supply and demand equations above, the equilibrium pre-tax wage and quantity will be

$$w = \alpha^{\frac{-1}{\sigma-\rho}} \beta^{\frac{1}{\sigma-\rho}} (1-\tau)^{\frac{-\sigma}{\sigma-\rho}} \tag{3}$$

and

$$L = \alpha^{\frac{-\rho}{\sigma-\rho}} \beta^{\frac{\sigma}{\sigma-\rho}} (1-\tau)^{\frac{-\sigma\rho}{\sigma-\rho}}. \tag{4}$$

This implies a post-tax wage of

$$\omega = \alpha^{\frac{-1}{\sigma-\rho}} \beta^{\frac{1}{\sigma-\rho}} (1-\tau)^{\frac{-\rho}{\sigma-\rho}}. \tag{5}$$

In other words, employers capture a portion $f \equiv \frac{\sigma}{\sigma-\rho} > 0$ of the EITC subsidy. Workers receive a subsidy – ω is increasing in τ – but less than would be obtained were wages fixed. Specifically, recipients receive only (1-f) of every dollar spent, and labor supply increases in proportion only to (1-f)τ rather than to the full subsidy τ.

This simple model assumes that all workers are eligible for the subsidy. Rothstein (2010) extends the model to consider a labor market (for, e.g., low-skill women's labor) in which some workers are eligible and some are not. Importantly, insofar as ineligible workers are perfect substitutes for eligible workers, both see their wages decline by the same amount. In this case, the decline in the pre-tax wage equals the product of the share of labor in the market supplied by subsidized workers and the above fraction f. This means that subsidized workers keep a larger share of the subsidy that is intended for them the smaller is their share of the workforce. Nevertheless, the share of the subsidy payment that is captured by employers is unaffected by the workforce composition.

Of course, the total amount received has to equal the amount spent. The difference is made up by unsubsidized workers. These workers' pre-tax wages decline, with no subsidy to compensate. The decline in the per-worker or per-hour wage, w, is proportional to the product of the subsidized share of the labor force with f. However, the total transfer from unsubsidized workers to employers is larger the *smaller* is the share of subsidized workers in the labor market.

Translated into real-world terms, this means that the EITC – and any other policy that increases labor supply – functions in part as a subsidy to employers of the workers in question. As the target recipients of the EITC tend to be relatively low income, the employer share of the incidence flows to employers of low-skill labor. This effect leads Lee and Saez (2012) to argue that the minimum wage is a complement to the EITC, as a binding minimum wage can prevent employers from capturing the credit.

There has been some confusion in the literature about the mechanism by which this incidence effect arises. It does *not* depend on the employer knowing that the worker is receiving the EITC. In a neoclassical model of the labor market, an individual worker's wage is unaffected by the specific factors influencing that worker's labor supply. Rather, the wage is set by the overall balance of supply and demand in the market, and thus by the *average* worker's labor supply.

One implication is that incidence considerations cannot explain the low take-up of the Advance EITC (discussed further below), at least in a neoclassical model. It

is possible that violations of that model's assumptions would allow employers to discriminate against workers who claim the Advance credit (and thus reveal that they are EITC recipients). But the neoclassical model's insight that any such discrimination is limited by the worker's ability to take another job with an employer who pays the going wage seems likely to be relatively robust.

4.4. Non-labor-market incentives

Beyond the EITC's labor supply effects, it can also distort decisions on other margins. As mentioned above, it can reduce the incentive to obtain more education. It also incentivizes fertility for many low-income workers. Finally, it has complex effects on the incentives to marry. The EITC creates a marriage penalty for many dual-earner couples, who might receive the credit if filing as two unmarried taxpayers but collectively have too high earnings to receive it as a married couple. (The extension of the schedule for married taxpayers in the 2000s partially offsets this, but by no means completely.) In other cases, the EITC can encourage marriage – e.g., between a non-working custodial mother and a working father who would be non-resident in the absence of the credit. We discuss empirical evidence regarding effects on these margins in Section 5.2.

4.5. Consumption & income smoothing

EITC recipients nearly always receive their credits as lump-sum payments in the spring. This has implications for savings and consumption. In a standard neoclassical model of household finances, families should borrow and save to smooth their consumption through the year, and the lump-sum nature of the EITC should have no implications for consumption decisions. But this model is not a good characterization of typical low-income households, not least because these households are often unable to borrow at reasonable interest rates (as evidenced by the high take-up of extremely high interest refund anticipation loans). If credit constraints are binding, a lump-sum payment has a smaller effect on the household's utility than would a series of smaller payments throughout the year.

Until 2010, the Advance EIC allowed recipients to receive the credit as part of their regular paychecks. But takeup of this option was extremely low, under 1% of all returns receiving the EITC, and the IRS cancelled the program. The low take-up rate was somewhat surprising, given the prevalence of refund anticipation loans. The decision to take these loans can only be rationalized if recipients have extremely high discount rates or, more plausibly, if they are severely credit constrained; either would seem to make a zero interest loan from the IRS attractive.

4.6. Interactions with other programs and the macroeconomy

We discussed above interactions between eligibility for the EITC and for other means-tested transfers. The EITC also interacts with other policies aimed at making work pay, most importantly the minimum wage. Political discussions often

treat the EITC and minimum wage as alternative ways of accomplishing this goal – each increases the take-home pay of low-skill workers, though the transfer is financed by the government in one case and by the employer in the other.

But it is not clear that the EITC and minimum wage should be seen as substitutes rather than complements. As discussed in Section 4.3, employers may be able to capture a portion of the EITC through reduced equilibrium market wages. Minimum wages can constrain this effect, placing more of the incidence on the intended recipient.

On the other hand, insofar as minimum wages lead to labor market rationing, they can make it harder for those hoping to receive the EITC to actually find jobs. The preponderance of evidence indicates that minimum wage increases have minimal impacts on the quantity of labor demanded (e.g., Allegretto, Dube and Reich 2008), indicating perhaps that a competitive model does not apply (Manning 2003) or that adjustments take place along a different dimension than wages and quantity transacted, e.g. a quality of work dimension.

As the Great Moderation of the 1990s and early 2000s was replaced by the Great Recession in 2007, interest in the cyclical properties of transfer programs has grown. It is not clear ex ante whether the EITC is cyclical or countercyclical. On the one hand, labor market slack makes it harder for people hoping to obtain the EITC to find jobs, and thus can be expected to reduce EITC eligibility and payments. On the other hand, however, weak labor market conditions generally lead to higher rates of part-year and part-time work. This could make many higher-wage individuals eligible for the credit, where they would not be with full-time, full-year earnings. The cyclical properties of the credit are thus an empirical question.

5. Research on the EITC

5.1. Participation & compliance

5.1.1. Participation and takeup

Relative to many other transfer programs, takeup of the EITC among eligible families is quite high. One study estimated that the 2004 take-up rate was 42% for Temporary Assistance for Needy Families, 55% for the Food Stamp Program (now SNAP), and 46% for the Supplemental Security Income program (HHS 2007). In contrast, the EITC takeup rate has been estimated at 80 to 86% by Scholz (1994).

EITC take-up rates have changed over time, due to increasing knowledge of the program but also changing program rules. Scholz's (1994) estimate of take-up in 1990 may overstate the current rate, as it was prior to the expansion of the EITC to childless individuals, for whom take-up rates are lower, and during a period when the IRS issued the credit to filers who appeared eligible but did not claim the credit. Plueger (2009) estimated a 75 percent takeup rate for the EITC in 2005. He also found that about 65 percent of eligible nonclaimants did not file taxes at all. The changes over time need to be taken into account in comparing results on take-up rates from studies that use data from different time periods.

Jones (2014a) uses IRS data linked to the Current Population Survey to examine how take-up rates vary with family structure, credit segment, and economic conditions. She estimates that the overall take-up rate rose from 77% to 79% between 2005 and 2009, and that take-up rates were similar for single and joint filers. Like Plueger, she finds that most eligible nonclaimants did not file tax returns. She also finds dramatic differences in takeup for taxpayers at different positions on the EITC schedule: The takeup rate was above 80 percent for those on the plateau and phase-out segments of the schedule, but under 70 percent for those on the phase-in. The discrepancy is largest for those with the smallest credits: In the phase-out range, those eligible for small credits were as likely to claim them as those eligible for larger credits, but in the phase-in range take-out rates were quite low for those eligible for small credits – under 40% for those eligible for credits under $100. This is likely attributable to low tax return filing rates among those with very low earnings.

Blumenthal, Erard, and Ho (2005), examining audited tax data, find a similar pattern. Among filers with a legal responsibility to file, the fraction that claimed the EITC rose from 89 to 94 percent between 1988 and 1999, while in households with no filing requirement the claiming rate rose from under 40 percent to 50 percent over the same period.

There are also substantial differences in takeup rates by demographic characteristics of the taxpayer. Jones (2014a) finds that working women had higher take-up rates (81% in 2005 and 82% in 2009) but that working men's take-up rate increased by more (from 72% to 76%). Take-up rates were much higher for those with children (82-86%, depending on the year and number of children) than for those without, though again the latter group's take-up rate increased by much more (from 56% to 65%). Using the 1999 National Survey of America's Families, Phillips (2001) found that low-income Hispanic parents are much less likely to know about the EITC than other low-income parents, and that among low-income parents who know about the EITC, Hispanics are less likely to have ever received the credit.

Given these differences in take-up rates across groups, changes in the composition of the eligible population over time can influence the overall take-up rate. Jones (2014a) found that joint filers, taxpayers with more children, and men experienced increasing rates of eligibility between 2005 and 2009, but eligibility rates fell for those with less education. Jones (2014b) used the 2006 CPS matched to tax data from 2005 through 2011 to examine changes in eligibility and found that less-educated, unmarried women experienced a greater hazard of eligibility loss due to movement to zero annual earnings compared to other labor-market groups.

There may also be interactions of takeup of the EITC with participation in other programs. Caputo (2006) found that any food stamp receipt tripled the odds of filing for the EITC, but found no significant correlations with SSI or TANF receipt. In contrast, Jones (2014) found that SNAP and Unemployment Insurance benefits were strongly positively associated with receipt of the EITC conditional on eligibility, but SSI was strongly negatively associated (TANF was negatively associated with takeup of the EITC but not statistically significantly so).

5.1.2. Noncompliance

Over-claiming of the EITC has been a persistent concern with the program. A major issue, as discussed above, is the definition of qualifying children. It can be challenging for potential recipients to know whether their children qualify. Enforcement is also challenging for the IRS, as many components of the qualifying child definition are not readily observed.

McCubbin (2000) uses an IRS sample of 2046 returns filed in 1994 that were subjected to additional scrutiny to estimate a 26 percent rate of overclaiming (though standard enforcement measures are expected to reduce that rate to 20.7 percent), primarily due to filers claiming real but non-qualifying children. Of an estimated $4.37 billion in excess claims, $3.08 billion was due to misreporting of qualified children.

Liebman (2000) examines the nature of compliance errors by matching the Current Population Survey (CPS) to respondents' tax returns. He finds that only 11 to 13 percent of EITC recipients had no children in their household at the time they received the EITC. Some of the apparently noncompliant households with children had incomes above EITC eligibility levels, but many of the ineligible families with children were very similar to eligible EITC families.

IRS Publication 596 lists a multitude of examples in which many economists would have trouble identifying who was eligible to claim the credit, and many situations in which multiple filers could claim different credits with choices over who claims qualifying children. The optimal choice is often hard to determine. Greenstein and Wancheck (2011) conclude that "EITC overpayments most commonly result from misunderstanding of how to apply the EITC's intricate rules regarding who may claim a child, especially in changing family situations involving separated, divorced, or three-generation families."

McCubbin (2000) reports that incorrect filing status accounted for 31 percent of EITC overclaiming. Most of these errors occurred on returns for which the IRS changed the filing status of the sampled taxpayer from single or head of household to married filing separately (who are not eligible for the EITC) or to married filing jointly (who are eligible but often receive a smaller or zero credit). McCubbin finds no support for the argument of Schiffren (1995) that the refundability of the credit contributes to noncompliance, and Taxpayer Advocate Service (2009) concurs. The rates of overclaiming may be overstated in the administrative data, as filers who request reconsideration of credit denials succeed in overturning nearly half of IRS rulings (National Taxpayer Advocate 2004).

5.1.3. Information

Surveys of low income tax filers at free tax preparation sites by Bhargava and Manoli (2014) indicate that eligible filers are unaware of the credit and its incentives. Similar to other survey evidence on awareness of the EITC (Maag 2005; Romich and Weisner 2002; Ross Phillips 2001; Smeeding, Ross Phillips and O.Connor 2000), 43 percent of eligible filers are not aware of the program and 33 percent of eligible filers aware of the credit believe they are ineligible. The majority (61 percent) of eligible filers aware of the credit underestimate the size of the credit, by an average of 83 percent,

and overestimate the likelihood of an audit (the median reported belief about audit probability is 15 percent but the actual rate is 1.8 percent).

Tach and Halpern-Meekin (2014) interview 115 EITC recipients and find that they tend not to understand the marginal incentives embodied in the credit, and not to differentiate the credit from their overall tax refund (see also Chetty and Saez 2013). They are unlikely to change their employment or marital status to maximize their refunds, but rather try to maximize their refunds for example by listing zero exemptions and deductions on their W-4s, filing returns as head of household rather than as married, and dividing children among the tax returns of multiple caregivers.

Bhargava and Manoli (2014) examine whether informational barriers help explain the puzzle of incomplete take-up of the EITC, using an experiment in which the IRS mailed letters providing information to filers who failed to claim the credit but seemed likely to be eligible. A mailing with a "textually dense, two-sided document that emphasizes eligibility requirements repeated later in the worksheet," meant to mimic traditional IRS communications, induced takeup among 14 percent of the nonclaimants . A simplified design increased takeup by an additional 9 percentage points and a mailing that clearly displayed the benefits of claiming increased takeup to 28 percentage points (5 percentage points more than the simplified form alone). The experimental estimates suggest that well-designed mailings could increase EITC take-up by 75 to 78 percent overall.

5.1.4. *The Advance EITC*

Until 2011, EITC recipients could choose to receive a portion of their credit with each paycheck rather than receiving a larger lump-sum at tax filing time. Take-up of this Advance EITC option was very low, only 1-2 percent of EITC claimants, leading to its cancellation.

Several explanations for the failure of the Advance EIC program have been offered. One is that recipients were unaware of the Advance EIC option. Jones (2010) conducted a field experiment aimed in part at this explanation: Employees at a single large firm were randomly assigned to receive information in the workplace about the Advance EITC option along with enrollment forms. This treatment raised participation rates only to 1.6% (from a base of around 0.6%). This echoes the results of an earlier IRS study in which EITC recipients were mailed information about the Advance option (IRS 1999), and demonstrates rather conclusively that lack of information about the Advance option cannot account for its unpopularity.

A second explanation is that recipients may have preferred that their employers not know that they were receiving the EITC. There is no reason for an employer to ever find out that a worker is receiving the regular credit, as that is an interaction between the worker and the IRS, but signing up for the Advance EIC required notifying the employer. The experimental treatment protocol used by Jones (2010) attempted to address this by requiring all employees to turn in forms, whether or not they wanted to enroll; this would have disguised the employee's choice from the manager, if not from the human resources office.

Third, some have speculated that recipients *prefer* to receive the EITC as a lump sum, treating it as a (zero interest) savings mechanism that allows them to accumulate larger balances than they would be able to do if faced with the

temptation to spend the credit as it came in. Some behavioral models posit that individuals have difficulty committing to saving plans, and that forced savings can be valued for this reason.

The Jones (2010) experiment included a second treatment arm aimed at understanding the role of forced savings motives. Employees were encouraged to sign up to have their Advance EITC payments deposited directly into a 401(k) plan. This led to a roughly 4 percentage point increase in participation in the 401(k) plan, but did not appreciably increase participation in the Advance EITC program. This seems to rule out motivations related to a desire to commit to long-term savings. However, 401(k) balances are highly illiquid; insofar as participants use the EITC to commit to medium-term savings (e.g., toward the purchase of durable goods), Jones' (2010) experiment would not get at that.

A final set of explanations relates to the unpredictability and instability of EITC recipients' employment histories. It may not be possible for a worker who expects to have several jobs over the year to accurately forecast her eventual credit eligibility, so signing up for the Advance EIC could expose her to large liabilities if she turns out to have over-estimated. Moreover, it takes time to set up the negative withholding arrangement; for workers with many short-term employment spells, this can be an important hassle.

Jones (2010; see also Jones 2012) points out that the United Kingdom Working Tax Credit (WTC) program, otherwise similar to the EITC, disburses payments on a monthly or bi-weekly basis. In that program, substantial majorities of participants wind up being over-paid due to a failure to report changes in eligibility during the year. This points strongly to default rules, rather than aversion to a large tax liability, as an important part of the explanation for the Advance EITC's failure.

5.2. Impacts on well-being

5.2.1. Consumption and Poverty

The expansion of the EITC in the mid 1990s was associated with a large drop in child poverty rates. This had a number of causes, welfare reform and the strong economy of that period among them. But several studies have found that the EITC was an important contributor (Haskins 2008; CBO 2007). Neumark and Wascher (2000) find that the introduction of state EITCs is associated with increases in the likelihood that families with sub-poverty-level earnings in one year have earnings levels above the poverty threshold in the next year.

There has been extensive research on the ways that EITC recipients spend their refunds. Barrow and McGranahan (2000) and Goodman-Bacon and McGranahan (2008) use data from the Consumer Expenditure Survey to examine monthly consumption patterns of EITC-eligible households. They find that these households spend more on durable goods in February, relative to other months and to other households. The biggest category of these extra expenditures is vehicles, an effect that they interpret as consistent with the program's pro-work goals, though there is no direct evidence that these expenditures are to facilitate commuting to work. They also find effects on furniture, appliances, and household goods. These

patterns are consistent with estimates of the effects of other tax refunds on short-run consumption (Souleles 1999; Parker, Souleles, Johnson, and McClelland 2013), so do not seem to be specific to the EITC population. They are also consistent with self reports of prospective EITC recipients (Smeeding, Phillips, and O'Connor 2000), who also say that they plan to devote some of their refunds to savings or to paying off bills (Mendenhall et al. 2012).

EITC recipients are unlikely to be using their refunds to build substantial nest eggs, however. Athreya, Reilly, and Simpson (2010) impute EITC receipt to the SCF to measure wealth of recipients, and find that EITC recipients have about one fifth the wealth of non-EITC recipients. The lowest fourth of EITC recipients have negative average wealth whereas the bottom fourth of non-recipient households have positive average wealth. Debt-to-income ratios of households receiving the EITC are much higher than those of non-recipients.

5.2.2. Health

Another way to assess the EITC's value for families is to examine objective measures of well-being. Evans and Garthwaite (2014; see also Boyd-Swan et al. 2013) examine EITC effects on women's health, using difference-in-differences models for women with multiple children relative to those with just a single child before and after the 1993 EITC expansion. They find that the expansion improved the mental health and self-reported health status of women with multiple children relative to those with fewer. They also find improvements in biological markers of health status, particularly those indicative of inflammation.

Other studies have examined the effect of the EITC on infant or child health (Baker 2008; Hoynes, Miller, and Simon 2013; Baughman 2012; Strully, Rehkopf, and Xuan 2010). Hoynes et al. (2013) find that EITC expansions reduce the incidence of low birth weight, a widely-used indicator of poor infant health. Their results indicate that each $1,000 in EITC income reduces low birth weight by 7-11%. This is a relatively small effect when judged solely by the hospital cost savings associated with the birth, but may be indicative of more widely distributed but harder to measure improvements in infant health. Hoynes et al. find that the effects do not appear to operate through increased insurance coverage, but that increased access to prenatal care may play a role, as may reductions in maternal smoking. Baughman and Duchovny (2013) also do not find an effect on insurance coverage of children aged 0 to 5. But they do find that state EITCs are associated with shifts from public to private coverage and with increases in self-reported health status for older children.

We digress for a moment to discuss a methodological issue that applies to these studies of EITC effects on health as well as to several of the other studies discussed below. A standard research design exploits differential EITC expansions for families of different sizes, or state-level EITC expansions, in a difference-in-differences framework. Studies using this design can identify the effect of EITC expansion on the outcome of interest (e.g., health), assuming there are no differential trends unrelated to the EITC. It is tempting to interpret the effects as reflecting the impact of additional income. But there is a complication here: EITC expansion has effects on other outcomes as well, most notably labor. Thus, the basic

difference-in-differences estimate combines the pure effect of income on health, holding all else constant, with the effect of additional work. This issue arises as well in most of the other studies below, many of which rely on very similar research designs. Unfortunately, there is no good solution. One can control for labor force participation, but this is an intermediate outcome and thus the resulting estimates are difficult to interpret.

Evans and Garthwaite (2014) find that their estimated health effects are basically unchanged when they control for employment status. This appears to suggest that the EITC effect on health is not working through the employment channel, but this conclusion is necessarily tentative absent a research design that can isolate women who would have been working with or without the expanded EITC.

5.2.3. *Marriage and fertility*

Studies of the effect of EITC expansions on marriage and fertility have generally found small effects, even though the incentives embodied in the credit can be very large as a percentage of total income for many low-income families. But conclusions about the size of behavioral distortions in this area must be quite tentative. There were numerous changes during the 1990s in the tax and transfer system, with offsetting effects on marriage and fertility incentives. The separate effects of each are hard to tease apart, given the state dependence in each of the relevant outcomes. Moreover, while it is relatively straightforward to measure a household's actual EITC eligibility, it is quite difficult to compute the counterfactual credit that would be obtained with a different family structure. Thus, nearly all estimates of responses to incentives regarding the structure of the family rely on not-very-accurate estimates of the magnitude of the incentive faced by a particular family.

 Dickert–Conlin and Houser (1998) describe marriage penalties and bonuses in the combined income tax and transfer systems, and show that the EITC, while subsidizing marriage for poor families, and penalizing marriage for near–poor families, did not overcome the large marriage penalties for poor families that arise from phaseouts of benefits in the transfer system. Holtzblatt and Rebelein (2000) calculate that the EITC increased marriage subsidies by 24% for families earning less than $15,000, but other income groups faced substantial marriage penalties, though 55 percent of penalties were assigned to families above the EITC's eligibility threshold.

As the EITC was expanded, incentives to marry increased for some due to larger marriage bonuses (increased net income after tax and transfer payments in the married state than in the single or cohabiting state) and decreased for others due to larger marriage penalties (decreased net income after tax and transfer payments in the married state compared to the single or cohabiting state). But income, work, and family structure are all jointly determined, making a convincing estimation strategy very challenging. Making matters worse, there is also substantial unobserved heterogeneity among the affected population. Consider, for example, the result that the apparent effects of welfare benefits on female headship disappear when individual fixed effects are included, implying that unobserved

heterogeneity completely explains the observed association (Moffitt 1994; Hoynes 1997). Thus, the endogeneity of observed states and marginal incentives should be expected to greatly affect estimates.

Past work on incentives embedded in both the tax and transfer system finds modest impacts on marriage. Alm and Whittington (1999) find that a 10 percent rise in the marriage penalty leads to a 2.3 percent reduction in the probability of first marriage. Moffitt (1994), Hoynes (1997), Hu (2003), Winkler (1995), Schram and Wiseman (1988), and Fitzgerald and Ribar (2004) find little effect of welfare generosity on the prevalence of two-parent or single parent families.

Increased incentives to be married due to welfare reform are variously estimated as increasing marriage (Schoeni and Blank 2000), decreasing marriage (Bitler et al. 2004; Horvath-Rose and Peters 2001), or having inconsistent or statistically insignificant impacts (Fitzgerald and Ribar 2004; Ellwood 2000; Kaushal and Kaestner 2001). Cain and Wissoker (1990) claim that the NIT experiments offer no evidence of effects on marriage.

Ellwood (2000) finds no evidence in the 1975 to 1999 CPS that the marriage rates of women with low predicted wages, who presumably faced marriage bonuses due to EITC expansions, increased relative to women with higher predicted wages, who presumably faced marriage penalties on average.

Estimates in Rosenbaum (2000) suggest that the EITC can have large negative effects on marriage, but the estimates are sensitive to the way tax costs are specified in the model. Eissa and Hoynes (2004) use repeated cross-sections in the CPS to estimate that a $1,000 increase in the cost of marriage decreases the marriage rate by 1.3 percentage points but simulate that EITC expansions increased marriage rates by 1 to 5 percent for families with income below $25,000 and reduced marriage rates by 1 percent for families with incomes between $25,000 and $75,000.

Baughman and Dickert-Conlin (2009) find very small impacts of the EITC expansions of the 1990's on birth rates, but higher first birth rates among married women and lower first births among unmarried women, which they interpret as suggestive evidence that the larger EITC encouraged marriage among single women.

Herbst (2011) finds that increases in the EITC are associated with very small reductions in the rate of new marriages, and finds no relationship between EITC amounts and new divorces.

Dickert–Conlin and Houser (2002) use linear fixed-effect models in SIPP data from October 1989 to December 1995 to estimate that a $100 increase in a woman's EITC (not the benefits to marriage arising from the EITC) lowers her probability of being married by less than half a percentage point, and the sign is reversed when instrumenting for EITC using policy variation applied to baseline characteristics. It is unclear how to interpret this result in light of the fact that marginal incentives to work and have children are also affected by the instrument, and the impacts of policy variation are far from uniform. Since some single women who expect a higher EITC under new policy (conditional on their baseline characteristics) will face an even higher benefit once married, and some a lower benefit, the predicted EITC instrument does not have a monotonic impact on potential outcomes, so the estimate cannot be treated as a local average treatment effect.

One fundamental problem with much of this work is that marriage should be affected by the difference in utility (often proxied by net income, though work disutility also plays a role) between the married state and the single state, not the EITC received in one state, and we do not observe the difference directly for single women, because we do not know the characteristics of her counterfactual spouse, or the behavioral responses that would accompany marriage.

Michelmore (2014) addresses this issue head on by predicting the earnings of unobserved potential spouses for unmarried women aged 18 to 50 with a high school degree or less, using data on single men from the 2001, 2004, and 2008 Survey of Income and Program Participation (SIPP) and probabilities of assortative mating from the CPS. She exploits the changes to credits in the 2000's that reduced marriage penalties, and finds that a $1,000 in expected loss of EITC benefits is associated with a 1.8 percentage point decrease in the likelihood of marrying and 1.1 percentage point increase in the probability of cohabiting over multiple years. However, the confidence intervals do not account for the imputation of unobserved spouse characteristics, so the true intervals for these estimates might well overlap zero.

The EITC creates incentives for low-income one-earner couples to legally marry, while for low-income two-earner families the incentive is to cohabit rather than marry. EITC expansions could thus be partly responsible for increased cohabitation rates in low-income two-earner families. But we still do not have good estimates of the impacts of these incentives. Most confidence intervals include zero, but impacts could easily be one or two percentage points for a thousand dollars of net benefit, which is a large impact.

5.2.4. *Child outcomes*

In addition to impacts on child health discussed above, a recent literature focuses on the impact of additional family resources due to the EITC on the educational outcomes of children. Studies that examine the effect of income in general find strong associations with educational outcomes (e.g., Rothstein and Wozny 2013). These imply that EITC-sized resource changes could have very large impacts on subsequent labor market outcomes of affected children, with social welfare implications that could swamp other more proximate impacts. However, because the EITC is expected to have large impacts on many dimensions of family life, it is difficult to ascribe all observed differences in child outcomes to income alone, and interpretation of the findings is difficult.

A particular concern is direct effects of maternal labor supply on children's outcomes. There is evidence that increased work among more educated mothers may hurt student achievement while increased work among less educated mothers may improve student achievement. This would be expected if the productivity of the average child care provider when a woman works in increasing student achievement is lower than more educated mothers but higher than less educated mothers.

To put measured effects of the EITC on child outcomes in perspective, it is helpful to compare to estimates from welfare experiments in the 1990's. These showed that a $1,000 increase in annual income increased young children's

achievement by about 5 percent of a standard deviation on average (Duncan, Morris, and Rodrigues 2011). Like the EITC, the treatments studied in these experiments affected both income and maternal labor supply, and this estimate does not distinguish between these challenges.

Dahl and Lochner (2012) use an instrumental variables strategy in data from the Children of the National Longitudinal Survey of Youth to find that a $1,000 increase in family income due to EITC expansions raises combined math and reading test scores by about six percent of a standard deviation. The test score gains appear to be larger for boys, for younger children (under 12), for Black or Hispanic children, and for children whose parents are unmarried.

The instrumental variables estimates are much larger than pooled linear regression or fixed-effects estimates. Dahl and Lochner attribute this to the influence of measurement error on the latter; to the declining marginal effect of income, implying that EITC payments to low-income families will have larger than average effects; to the different uses to which families put lump-sum credits; and to the persistence of income shocks due to changes in the EITC schedule, which likely signal increased expected income for many years in the future.

But there are also reasons to be concerned about the causal interpretation of Dahl and Lochner's estimates. Their instruments are rather weak, a situation that can lead to inconsistent and misleading results (Bound, Jaeger and Baker 1995; Stock and Yogo 2010). The instrumental variables estimates are also difficult to interpret, as the instrument (the change in the family's simulated EITC due to changes in credit schedules) can have effects through a variety of channels, including family structure and labor supply, and these effects may move in different directions for different families. This implies that Dahl and Lochner's estimates cannot be interpreted as local average treatment effects for any well-defined subpopulation.

Still, it seem likely that increased income associated with EITC expansions did improve test score outcomes, and that these improvements will translate into better life outcomes. It is especially reassuring that other authors have recently found impacts that are generally in line with Dahl and Lochner's estimates.

Using SIPP data, Michelmore (2013) uses state EITC variation to find that an increase in the maximum EITC of $1,000 is associated with 18-23 year olds in likely EITC-eligible households being one percentage point more likely to have ever enrolled in college and 0.3 percentage points more likely to complete a bachelor's degree. The association is driven by individuals younger than 12 at the time of state EITC implementation, and there is no apparent effect of the EITC expansions on older children.

Similarly, Maxfield (2013) uses the National Longitudinal Survey and finds an increase in the maximum EITC of $1,000 increases math achievement by about seven percent of a standard deviation, increases the probability of high school completion at age 19 by about 2 percentage points, and increases the probability of completing one or more years of college by age 19 by about 1.4 percentage points. The apparent effects of EITC expansions are larger for boys and minority children, and the effects on educational outcomes are larger for children who were younger during the expansion.

5.3. Labor market impacts

An enormous literature in the 1990s examined the labor supply effects of the EITC, particularly on single mothers, much of it exploiting the large expansion of the program in 1993. This work was extensively reviewed by Hotz and Scholz (2003), and we do not discuss it at length here. The stylized facts were that the EITC expansion led to sizeable increases in single mothers' employment rates, concentrated among less-skilled women and among those with more than one qualifying child. Effects on hours of work were generally small.

There has been less work on this topic in the last decade, but many additional reviews (see, e.g., Eissa and Hoynes 2006, 2011; Hoynes 2009; Meyer 2008, 2010). We review a few key papers here, but refer readers to Hotz and Scholz (2003) and the other reviews listed above for a more extensive discussion.

5.3.1. Labor supply – extensive margin

No recent empirical studies have countered the earlier result (from, e.g., Eissa and Liebman 1996; Meyer 2002; and Meyer and Rosenbaum 2001) that the EITC promotes labor force participation among single mothers. Dahl, DeLeire, and Schwabish (2009) find that more generous EITC benefits are also associated with higher year-over-year earnings growth for those who are employed, suggesting that the additional employment is not coming via "dead end" jobs with little room for advancement.

Early studies focused on single mothers because the program was most obviously targeted at them and because the predicted effects for that group are relatively straightforward. Eissa and Hoynes (2004), however, point out that the predicted and realized effects for married couples are quite different. In particular, the EITC generally imposes positive tax rates on even the first dollar of a secondary earner's earnings, so is expected to reduce work in this group. Eissa and Hoynes find that EITC expansions between 1984 and 1996 reduced married women's labor force participation rate by about one percentage point, with larger effects for subgroups facing the strongest disincentives.

A substantial share of the evidence regarding the EITC's labor supply effects derives from the 1993 EITC expansion and the historic increase in single mothers' employment during the mid 1990s. This is illustrated in Figure 8, taken from Eissa and Hoynes (2011). There were a great many other things happening during that period that might have contributed to the rise in employment, including in particular welfare reform and the strong economy of the late 1990s. Many studies identify the EITC's effect based on contrasts between women with a single child and those with two or more children.

These studies implicitly assume that other policy changes would not have had differential effects on the two groups. But this is not obvious. One might expect quite different selection into nonparticipation for women with multiple children, especially young children not yet eligible for public school (Looney 2005), for whom earnings net of child care costs can be very low, than for those with only a single child, and the effects of welfare reform might be quite different for the two groups. This raises concerns about the family structure-based identification strategy.

A related concern is that the labor supply outcomes seen in the mid-1990s studies might be specific to that time period. In particular, one might expect to see larger effects of work incentives in tight labor markets, as in the mid- to late-1990s, than when there is more slack.

While the literature has not conclusively addressed either of these concerns, what evidence there is is encouraging. Estimated labor supply effects appear to be quite robust across different time periods (including studies identified from pre-1993 expansions). Studies that exploit state EITC expansions also find similar effects. Consistent with this, the sharp rise in the relative labor force participation rates of single mothers in the mid 1990s, in Figure 8, appears to have persisted since.

Mead (2014) argues that the change in incentives was not responsible for moving single mothers into the labor force, relying on survey evidence indicating that potential beneficiaries did not understand or even know of the EITC and that welfare administrators did not credit the EITC with declines in welfare rolls. Mead is generally dismissive of the "several statistical studies that credit the EITC with much, even most, of the rise in work levels among welfare mothers" and claims that "whether the EITC drove welfare recipients to work in the '90s is ultimately a question about human motivation, and on this matter economic analysis alone cannot be trusted to provide a complete answer."

But even if non-working potential recipients of the expanded EITC knew nothing about it, the EITC could still have had an effect by reducing exit from the labor force among those who had worked and received the credit in an initial year. Low-income workers have high rates of exit and entry, so a modest impact on labor force exit can accumulate into a large change in the stock measure of labor force participation. The studies on participation are generally silent on the specific mechanism for the observed changes, but it seems plausible given general ignorance about tax policy that impacts on net income are realized after the fact and influence subsequent behavior, keeping many single mothers in the labor force who otherwise would have exited.

5.3.2. Labor supply – intensive margin

There has been somewhat more activity in the last decade on intensive margin effects – effects of the EITC on hours worked per year among those who would have worked in any case.

Many of the studies that documented large extensive margin effects for single mothers examined effects on average hours worked among workers as well. These generally found very small or zero effects. But the difference-in-differences research design that most of these studies relied on is not ideally suited to this question. Estimated effects on mean hours of work among those with some participation combine behavioral effects on those who would have worked in any case with composition effects driven by differences between this group and those who are brought into participation by the EITC expansion. These composition effects may confound true intensive-margin responses.

This has motivated more structural analyses of labor supply (Blundell and MaCurdy 1999). These models parameterize the individual's utility function, then

estimate the parameters under an assumption that all observed choices are utility maximizing. If the utility function is correctly specified, the resulting estimates can be used to compute behavioral effects on intensive-margin labor supply net of composition changes. However, this is easier said than done. In particular, it is difficult to incorporate into structural models a realistic distinction between labor force participation and hours of work decisions. A typical approach is to discretize the labor supply choice, making zero supply (non-participation) one among a small number of choices (Keane and Moffitt, 1998; Blundell, Duncan, McCrae, and Meghir, 1999; though Heim 2010 is an exception). More recent models also incorporate potential dynamic effects and incentives (Blundell, Costa Dias, Meghir, Shaw 2013).

An advantage of these models is that they yield estimates of structural parameters that can be used to simulate the impacts of policies that have not yet been tried, where more reduced form studies estimate effects that are harder to generalize outside of the specific setting. Blundell, Duncan, McCrae, and Meghir (2000), for example, use estimates from a structural labor supply model to predict the impact of the United Kingdom's Working Family Tax Credit (WFTC), a rough analogue of the EITC that is available only to individuals meeting minimum hours of work requirements, before data on its actual effects were available.

Set against this major advantage is that structural estimates are often heavily dependent on parametric assumptions, often made for reasons of computational tractability. This makes it difficult to assess the credibility of the specific parameter estimates, either within the sample or for out-of-sample predictions. Perhaps for this reason, fully structural estimates have not been prominent in the recent literature on the EITC's labor supply effects, though they have played a larger role in assessments of the UK's WFTC and related programs (Blundell, Brewer, Haan, and Shephard, 2009; Blundell and Hoynes, 2004).

The U.S. literature has focused on more reduced-form methods, with substantial recent attention to the development of strategies that can identify intensive-margin behavioral responses without a great deal of parametric structure. An example is Saez (2010). Saez notes that standard labor supply models predict that individuals in the phase-out range will reduce their hours in response to the positive marginal tax rate that they face, but that the incentive disappears once the individual's earnings reach the top of the plateau range. This is illustrated for a hypothetical EITC expansion in Figure 9. The lines marked "C" illustrate indifference curves between leisure and consumption that would generate a traditional labor supply response. Person C would have chosen labor supply above the maximum level for credit eligibility had the credit not existed, but who responds to the program by reducing her labor supply into the phase-out range in order to receive a credit. This sort of response leads to "hollowing out" of the earnings distribution around the point where the credit disappears, due to non-convexity of the budget set here.

By contrast, the lines marked "B" show the indifference curves for an individual who would have chosen labor supply sufficient to place her in the phase-out range before the expansion, but who after the expansion locates herself at the "kink" point between the plateau and the phase-out. This sort of response will lead to a point mass in the earnings distribution at this kink (and similarly at the kink

between the phase-in and plateau segments), as a range of individuals shift from just above the kink to locate exactly at it.

The lines marked "A" show a third individual who would have been in the plateau range before the expansion. For A, the expansion represents a pure income effect, with no distortion to the relative price of leisure. Income effects may produce increases or reductions in labor supply, but these are not likely to be large.

This figure illustrates the unambiguous prediction that if the intensive margin elasticity is non-zero, a measurable fraction of the population will relocate from the phase-in and phase-out ranges to the kink points when the EITC is expanded, while others will move from the end of the phase-out kink point onto the phase-out segment. Assuming that underlying preferences are smoothly distributed, then, one can measure the size of the intensive margin labor supply elasticity by the excess mass of the earnings distribution located at or near the convex kink points, relative to what is observed a bit above or below those earnings levels.

Carrying out this exercise, Saez (2010) finds little sign of bunching at the EITC kink or at other, similar thresholds in the tax schedule. This is consistent with the other evidence that intensive margin labor supply elasticities are small, though it could also indicate that people are simply unable to choose their total annual earnings with much precision (as would occur if people had less-than-full ability to predict their December hours or earnings earlier in the year).

There is one group for which Saez does find substantial evidence of bunching: The self-employed. Individuals with positive self-employment income are very disproportionately likely to have earnings at or very near the first kink point of the EITC schedule, at the end of the phase-in range. Interestingly, there is no sign of bunching even in this group at the second kink point (at the beginning of the phase-out range), nor of a hollowing out of the density at the third (at the end of the phase-out range), though the standard model would predict all three.

As Saez points out, the total marginal tax rate, combining the EITC and other taxes (e.g., payroll taxes), is negative in the phase-in range. This means that an individual or family with earnings below the first kink point would come out ahead by reporting to the IRS *higher* earnings than it actually had. Alternatively, a family that would underreport its income in the absence of the EITC would face an incentive not to do so – up to the first kink point – in its presence. The self employed likely have a fair amount of latitude over how much income to report, as there is no external check on their reported earnings. Thus, Saez suggests that the bunching he observes likely reflects decisions to report casual earnings (from, e.g., babysitting) that would not have been reported to the IRS in the absence of the EITC. This is consistent with evidence from Lalumia (2009) that reported self-employment income has grown over time among EITC recipients, and that this income tends to increase the EITC payment rather than reduce it.

One potential explanation for the general failure to find meaningful intensive margin effects is that EITC recipients are only vaguely aware of the program rules, and may not realize the incentives they face. Chetty and Saez (2013) report on an information experiment conducted on clients of the H&R Block tax preparation firm. Tax preparers were asked to spend a few minutes with randomly selected clients explaining the EITC rules and the marginal incentives that the client faced. Chetty

and Saez measure the effect of this treatment on the subsequent year's earnings and EITC payment. They find only small effects on average. When they focus on the subsample of preparers who seem to have been particularly effective at explaining the marginal incentives, they find somewhat larger effects: Treatment by these preparers increased EITC payments the next year by about 3%, on average. These effects are concentrated among the self employed, though Chetty and Saez find effects on wages as well.

This at least suggests that intensive-margin responses may be depressed by lack of information about the marginal tax rate, though in our eyes the treatment-group responses remain quite small regardless. For taxpayers with two children in the phase-in range, where the marginal tax rate is 40%, a 3% increase in EITC payments due to moving from zero knowledge to full knowledge of the incentives corresponds to an intensive-margin labor supply elasticity of about $0.03/0.40 = 0.075$. This calculation is inexact in many ways – not all participants are in the phase-in range; some may have known about their tax rates even without the treatment, or may not have fully understood them with it; etc. But even a full accounting for all of these factors would be unlikely to yield an implied intensive-margin elasticity even in the ballpark of the extensive-margin elasticities discussed above.

Chetty, Friedman, and Saez (2013) build on the Saez (2010) and Chetty and Saez (2013) papers, using variation across zip codes in the amount of bunching among the self-employed as a proxy for knowledge of the EITC schedule in the area (though it may alternatively be interpreted as a proxy for the density of paid tax preparers who focus on EITC recipients). They find that across areas, the degree of bunching at the kink among the self employed is positively correlated with the rate at which new parents' annual earnings change in a EITC-increasing direction. Importantly, the latter is potentially more sensitive to realistic labor supply responses than is a Saez (2002)-style measure of bunching at the schedule's kinks. It may be difficult for respondents to bunch precisely if they do not have exact control over their hours of work or have a hard time predicting their end-of-year earnings when they make labor supply decisions earlier in the year, but they may nevertheless be responding to the EITC's intensive margin elasticities by moving themselves further up the schedule than they would otherwise wind up being.

Chetty et al. (2013) reason that the self-employed always have an incentive to raise their stated income to the first kink point, and can frequently do so by manipulating their reported earnings. Thus, if bunching is infrequent in a particular area, Chetty et al. (2013) infer that most individuals in that area are not aware of the EITC schedule. (Again, they may simply lack access to paid providers trained in coaching clients to maximize EITCs.) Thus, they interpret the positive correlation with new parents' labor supply changes as an indication that when people know about the credit they change their labor supply – apparently on the intensive margin – to increase it. The magnitude of the changes implies that the average intensive margin earnings elasticity, across all areas, is between 0.14 (in the phase-out region) and 0.31 (in the phase-in region).

The discrepancy with prior estimates that generally fail to find any meaningful intensive margin response likely has several potential explanations. One

is that past work focuses primarily on the phase-out range, as this is of greatest policy interest – as discussed above, policymakers are more concerned with tax-induced reductions in work effort than with increases. Chetty et al's estimate of the intensive margin response in this range is quite small. Many past studies could not have identified effects of this magnitude.

Other potential explanations relate to limitations of the difference-in-differences (DD) estimates of the effect of EITC expansions on hours of work that have formed the bulk of past work. As discussed above DD studies can only examine effects on hours of work conditional on participation, and these may be misleading about true intensive margin effects. Moreover, the DD studies typically rely on household surveys, which may measure annual hours with error.

On the other hand, there are also reasons to be concerned about the generalizability of Chetty et al.'s results, which are identified from the specific population of new parents in the calendar year in which a first child is born. These individuals may have unusual latitude to respond to tax incentives on the intensive margin, simply by delaying or accelerating their return to work following parental leave. Other workers may find it more challenging to adjust their hours worked. Chetty et al. present event-study evidence that effects persist (but do not grow) for several years after the child's birth. But many of the families in question will have additional children in that interval, so will be facing more generous schedules with stronger incentives than in the initial year. Thus, constant effects imply a declining labor supply elasticity.

All of these considerations lead us to conclude that the true intensive margin elasticity is probably positive but small. It is not clear that there is much of a discrepancy between the earlier work that found an elasticity near zero and Chetty et al.'s (2013) estimates that it averages around 0.14 in the phase-out range, in a potentially non-representative subpopulation. This is several multiples smaller than consensus estimates of the extensive-margin elasticity around 0.7 to 1.0.

But there are three important puzzles outstanding. First, why do Chetty et al. (2013) find larger elasticities in the phase-in range? Is this reporting, along the lines of the reporting issues that presumably lead to bunching among the self employed? (For example, tipped workers might report more of their tips to the IRS when they are in the phase-in range.) Or is it somehow easier for people to increase their labor supply in response to negative tax rates than it is to reduce it when tax rates are positive?

Second, do the responses that have been labeled as "intensive margin" reflect changes in the number of weeks worked per year or in the number of hours worked per week? The former can be seen as a form of extensive-margin response, while the latter cannot – in any event, it is difficult to see how the elasticity of annual labor force participation can be much larger than the weekly participation elasticity. Unfortunately, we are aware of no evidence on the relative importance of weeks and hours responses to the EITC. If we were to pick one unresolved question regarding the EITC's labor supply effects for future researchers to examine, it would be this.

Third, what to make of Chetty et al.'s estimates of higher elasticities in zip codes in the top decile of EITC knowledge, 0.29 in the phase-out region and 0.84 in the phase-in? One interpretation is that intensive margin labor supply elasticities

with respect to known incentives are reasonably large, and average elasticities are small only because people are generally unaware of their marginal tax rates. But it isn't clear that any realistic policy will raise awareness by all that much. Moreover, Chetty et al.'s proxy for knowledge of the tax schedule could equally be well interpreted as a proxy for access to advisers with financial interests in maximizing recipients' refunds and/or a willingness to bend the rules to do so. This suggests that responses in high-knowledge areas may not actually reflect taxpayers' underlying preferences or even their true labor supply, and that expanding this form of knowledge may not be welfare improving.

5.3.3. Incidence

In 2003, Hotz and Scholz (2003) concluded that there was only one major EITC-related topic that had not received serious scholarly attention: The economic incidence of the credit. The topic has received some attention since, but remains under-studied.

As we discussed above, the EITC creates an incentive for single mothers to participate in the labor market, though there is heterogeneity in the incentive regarding increases or reductions of hours conditional on participation. (Members of married couples face more complex incentives, and some secondary earners face positive average tax rates on their potential earnings.) The empirical evidence suggests that the extensive margin responses have been much larger than intensive margin responses, and thus that the EITC produced large increases in single mothers' labor supply.

Standard models of economic incidence (Section 4.3) have two key predictions in this setting. First, the increase in labor supply should have reduced pre-tax wages. Second, the decline in wages should be observed both for EITC recipients and for others who are close substitutes for them in production (that is, who compete in the same labor markets).

This second prediction makes wage effects much more challenging to estimate than are labor supply effects. A standard research design for studying labor supply effects contrasts single mothers with one versus two or more children, in periods where the EITC schedule became relatively more generous for the latter. This design cannot be used to identify the effect of the credit on wages: Insofar as single-child and multiple-child mothers participate in the same labor market, one would expect any wage effects of the EITC to be the same for the two.

Identifying wage effects thus requires an empirical strategy that compares two separate labor markets, distinct enough that participants in the two are not close substitutes in production but nevertheless similar enough that one can credibly distinguish EITC effects on the difference between the two from other determinants of wages. This is a tough order.

Leigh (2010) exploits the introduction of state-level EITCs in a difference-in-differences framework. His identifying assumption, not unreasonable, is that it is difficult for employers to substitute workers in different states, at least in the short term.

Leigh finds that a 10% increase in the EITC – through, e.g., the introduction of a state EITC equal to 10% of the federal credit – leads to a 5% reduction in pre-tax

wages for high school dropouts, and a 2% reduction for high school graduates, with no effect on the wages of college graduates. These wage effects are similar for eligible and ineligible members of these groups, as predicted by the incidence model above.

In interpreting these surprisingly large effects, Leigh focuses on the ratio of the effect of the EITC on labor supply to the effect on wages. Comparing equations (4) and (3), above, this ratio equals the elasticity of labor demand; Leigh estimates that it is around -0.3.

But examining only the ratio of the two coefficients obscures an important part of the story. Assuming that the labor demand curve is not upward sloping, equation (5) indicates that the effect of a reduction in the effective tax rate on net-of-tax wages is always positive, and equation (4) indicates that wages can fall by no more than the average subsidy rate across all workers in the labor market. Leigh's estimates are not consistent with these restrictions. The federal EITC phase-in rate is around 40%, so a 10% increase in the EITC corresponds to an earnings subsidy of 4% or less. Leigh finds that this reduces the pre-tax wage of high school dropouts by 5%. Moreover, only one-quarter of these workers are EITC eligible. Thus, Leigh's estimates imply that employers capture approximately 500% of total EITC spending, and that state EITCs reduce the after-tax incomes not just of ineligible workers but of eligible workers as well. This cannot occur through pure incidence channels.

To be clear, we do not criticize Leigh's methodology or identification strategy. Both are reasonable, particularly relative to other feasible solutions. But they yield somewhat unreasonable results. One possible interpretation is to note that the 5% wage effect has a standard error of a bit over 1%, so we cannot reject that net-of-tax wages for eligible workers were constant. But even this requires a wage effect quadruple what would be seen with wholly inelastic labor demand.

Rothstein (2008) uses a different strategy to estimate wage effects of the EITC. He focuses on the 1993 national expansion of the program, but notes that any labor market effects of this expansion should be concentrated in the low-skill labor markets where EITC recipients participate. He thus examines differences in single women's wage trends by skill level (proxied by position in the wage distribution) for evidence of EITC effects. He finds that low-skill women's relative wages *rose* in the mid-1990s but that the rate of relative increase was slower than in the prior period. Under an assumption that technical change was increasing the relative demand for low-skill women's labor at a constant rate over the late 1980s and early 1990s, the impact of the EITC can be identified from the change in the relative rate of earnings growth. He estimates that combination of wage and labor supply changes over the mid-1990s are consistent with a total labor supply elasticity around 0.7, driven by the extensive margin, and a labor demand elasticity around -0.3.

Two additional papers use different strategies to examine the EITC's effects on wages. Eissa and Nichols (2005) examine trends in 10th percentile wages for single mothers. They find no indication that these were affected by EITC expansions, but suggest that the EITC's effects may be masked by the floor placed on wages by the minimum wage. Azmat (2008) examines a United Kingdom program, the Working Families' Tax Credit, that subsidizes the earnings of targeted workers. The

WFTC is administered via workers' paychecks (as with the Advance EITC). Thus, employers know which workers are and are not receiving the credit. Azmat examines differences in wages for participating and non-participating workers. This difference, while independently interesting, is uninformative about incidence effects if the two groups of workers are substitutes in production.

While each of these studies makes a valiant effort to identify wage effects of the EITC, we think – each of us having authored one of them – that they are collectively far from decisive. There is room for much more work on the topic. Unfortunately, given the identification challenges discussed above, we are not optimistic that the problem will be resolved in the near term.

In the absence of a clean identification strategy for the EITC's effects on wages, a more promising approach might be to rely on external estimates of the labor demand elasticity to calibrate a calculation of the distributional effects of the EITC. This is done by Rothstein (2010). With an extensive-margin labor supply elasticity of 0.75, an intensive-margin elasticity of zero, a labor demand elasticity of -0.3, and the observed distribution of eligible and ineligible workers across labor markets (defined by skill levels), he finds that employers capture about $0.36 of each dollar spent on the program through reduced wages. Workers' after-tax incomes rise by only $0.73 -- $1 in EITC payments, plus $0.09 from increased labor supply, less $0.36 in reduced wages per hour worked. Importantly, there are also distributional effects within the group of workers. The eligible workers themselves receive a net transfer (EITC payment less wage effect) of $0.83. After-tax incomes rise by $1.07, with the additional $0.24 coming from increased labor supply (with only second-order effects on recipients' utility). But ineligible workers lose $0.18 through reduced wages and $0.16 through the induced reductions in labor supply.

Table 7 illustrates the effects on four demographic groups: Single mothers, single women without children, married mothers, married women without children, and employers. Rothstein (2010) assumes that labor markets are segmented by gender, age, education, and marital status. He focuses exclusively on female labor markets. As there are few single fathers and married men are more likely to be primary than secondary earners, there are unlikely to be meaningful EITC effects on the male labor market. In the single women labor market, the EITC induces a substantial increase in the amount of labor supplied, driving down wages and negatively impacting childless workers. Employers capture nearly 100% of total spending, so all of the transfer received by EITC eligible workers is paid for with transfers away from ineligible workers. In the married women market, however, the EITC's initial effect is to reduce total labor supply. Wages thus rise modestly, with positive impacts on childless workers and transfers away from employers.

These simulations are far from decisive. Among other limitations, the assumption that single and married women participate in distinct labor markets is not well supported.[7] But the general conclusion that labor supply subsidies in

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[7] Rothstein (2010) also presents estimates in which there is a single female labor market for each education-age group. This does not change the amount of the credit that employers are able to capture, though it does change the distribution of

competitive labor markets are in part captured by employers is almost certainly robust. This has important policy implications. In particular, Saez's (2002) conclusion that an EITC structure is approximately optimal depends on the incidence of the credit falling exclusively on the worker. Incidence considerations strengthen the argument for Negative Income Tax-like structures, with positive transfers at zero earnings and less negative tax rates at low earnings. They also militate for combining the EITC with other policies aimed at limiting employer capture, such as the minimum wage (Lee and Saez 2012).

5.4. Interactions

5.4.1. *Interactions with cash welfare*

The EITC is in many ways a substitute for cash welfare, both in the minds of its political backers and in the trends in caseloads and expenditures over time. Moreover, the major expansion of the EITC in the mid-1990s roughly coincided with welfare reform, and with a large increase in the labor force participation of single mothers. Interactions between the programs are thus of interest (though mostly historically; TANF is a shadow of the former AFDC program, and is no longer a major component of the antipoverty portfolio).

Grogger (2004) studies transitions onto and off of welfare in the 1990s. He identifies the effect of EITC benefits on these transitions both from variation in state EITCs and from changes in the relative generosity of the federal EITC across different family sizes. He finds that higher EITC benefits are associated with lower probabilities of entering welfare. However, there is no association with the likelihood of exiting welfare, suggesting that work subsidies were not a major "pull" factor in the decline in welfare caseloads. This is consistent with our interpretation of Mead's (2014) survey results above.

Hotz, Mullin, and Scholz (2010) find that EITC expansions may have had important effects on former welfare recipients' labor force participation. Studying a sample drawn from California's database of welfare recipients, they find that the differential expansion of the EITC for families with two or more children raised employment rates of multiple-child families by 3.4 percentage points relative to families with one child. They conclude that this is consistent with an employment elasticity around 1.3, at the upper end of the range of previous studies. They do not examine transitions from welfare to work directly, so their estimates are also consistent with the EITC's effect operating through reduced exit from work rather than through increased entry.

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benefits across demographic groups: Wage losses are smaller, so eligible workers see larger increases in their after-tax incomes, but are spread across larger groups of ineligible workers.

5.4.2. Interactions with labor market programs (UI, minimum wage) & countercyclical role

The EITC also likely interacts importantly with labor market institutions, including unemployment insurance, disability insurance, and the minimum wage. There has been relatively little work on these interactions. Neumark and Wascher (2011) use variation in state EITCs and state minimum wages in a difference-in-differences framework to examine the interaction between these two policies. In models for low-skill single mothers' employment and earnings, they find positive interaction effects of the generosity of the state EITC with the level of the minimum wage. They find some evidence of a negative interaction effect on employment of low-skilled, childless men and women. In qualitative terms, the pattern of results appears consistent with what one would expect the impact of the EITC to be in a labor market subject to a binding minimum wage: Labor supply increases, wages are largely unaffected, and jobs are rationed. It is not clear from Neumark and Wascher's (2011) reported results how to interpret the magnitudes, however.

LaLumia (2013) examines interactions of the EITC with unemployment at the individual level. She finds that unemployment spells that coincide with the receipt of EITC payments last longer, consistent with the presence of important liquidity effects on job search behavior (Chetty 2008; Card, Chetty, and Weber 2007).

Bitler, Kuka, and Hoynes (2014) also study interactions between the EITC and unemployment, but at a macroeconomic level. Specifically, they ask whether EITC recipiency and payments rise in business cycle downturns. As noted earlier, this relationship is theoretically ambiguous: Labor market slack may reduce the number of would-be EITC claimants who are able to find work, but may also lead to more eligibility among involuntary part-year workers whose wages are too high to qualify for the EITC with full-year work or among married couples who could qualify for the credit with one earner but not with two. Bitler et al. find that higher unemployment rates are associated with more recipiency and payments for married couples, implying that the second effect dominates for this group, but that the net effect is negative but statistically insignificant for single individuals. This implies that the EITC plays a weaker countercyclical stabilization role than do explicitly countercyclical programs like unemployment insurance or traditional means-tested transfers like TANF and SNAP.

6. Proposed modifications

The EITC is generally seen as a successful program, but it is by no means perfect. We are aware of a number of serious proposals to modify the program in various ways.

6.1. Advance EIC

The biggest dissatisfaction with the EITC revolves around its arrival as a lump-sum payment, much of it captured by tax preparers and/or high-interest-rate lenders. It seems clear that the EITC would be more effective as a means of

supporting low-wage families if it could somehow be delivered more evenly through the year. But the desire to do this runs up against the failure of the Advance EITC program. Thus, while there is certainly the ambition to change the method of payment, we are not aware of workable proposals to do this.

Moreover, it is clear that there would be real drawbacks from any such effort. The payment of means-tested health insurance subsidies under the Patient Protection and Affordable Care Act (PPACA, or Obamacare) is a useful analogy. Eligibility for subsides depends on annual family income, just like the EITC. But because the subsidies are meant to make health insurance affordable, they are paid out gradually through the year. This means that families that over-estimate their eligibility for subsidies may be faced with large bills at tax time. At this writing, it is not clear how this will be handled.

It is easier to see a route toward reducing the role of tax preparers in the administration of the EITC. The IRS encourages claimants to simply write "EITC" on their tax returns rather than attempting to calculate it, presumably in part to simplify returns so that recipients do not need to engage preparers. Moreover, there exist in many areas not-for-profit tax preparation services for those who still need assistance. There remains the question of how to reduce recipients' reliance on high-interest refund anticipation loans. Most energy here has been devoted to better disclosure of the loan terms.

6.2. Changes within the same basic structure

There have been a number of proposals to expand the EITC, either as a whole or for particular groups. These are often made in the context of discussions about whether to raise the minimum wage. Opponents of minimum wage increases often argue that the EITC is a superior alternative. But this reflects an unsupported assumption that the two programs are substitutes. The incidence considerations above imply that they are best thought of as complements, and that increases in the EITC strengthen the case for raising the minimum wage (Lee and Saez 2012; Konczal 2013).

Numerous expansions in generosity of the credit for larger and smaller family sizes have been proposed, and the recent expansion of the credit for tax units with 3 qualifying children reflects the push for expansion.

One area of recurrent concern is the incentives for non-custodial parents. A focus in this area has been to create incentives for the payment of child support, by allowing these parents to receive the credit but conditioning this on the payment of child support (Primus 2006). Non-custodial parent credits have recently been implemented in New York and Washington, DC. A regression discontinuity evaluation of New York's non-custodial parent credit finds increased work and payment of child support in full for non-custodial parents just eligible for the credit (Nichols, Sorenson, Lippold 2012). An ongoing experiment in New York City is designed to test a credit-like conditional transfer for childless workers in certain subgroups, including non-custodial parents.

A more consequential change would be to expand the EITC for childless workers. This has attracted support of late from both President Obama and Rep.

Paul Ryan (R-WI); there are few anti-poverty policies about which that could be said.

Berlin (2007) proposes a more radical modification in the structure of the EITC. He would make EITC eligibility depend on individual earnings, without regard to marriage or children. This would eliminate the second worker penalty, alter marriage and fertility incentives, and generate tens of billions of dollars in additional credit payments, mostly to married couples. The expansions of the plateau for taxpayers married filing jointly during the 2000's have made the proposal cheaper to implement, but budgetary concerns make implementation of the proposal unlikely.

Several authors have proposed rationalizing the definitions of children across tax and transfer rules (e.g., Maag 2011), which would reduce compliance costs. But recent policy has if anything moved in the opposite direction. For example, the Affordable Care Act extended health insurance under parental policies to age 25, a threshold that has not been used for other programs.

6.3. EITC expansion for workers with disabilities

There have been several recent proposals for a new EITC aimed exclusively at workers with a documented work-limiting disability. For example, the Disability Policy Panel of the National Academy of Social Insurance in 1996 recommended the creation of a refundable Disabled Worker Tax Credit (Oi 1996, page 122). The impetus for the proposals is the pending exhaustion of the Social Security Disability Insurance (SSDI) trust fund and the perceived disconnect between the expressed desire to work among beneficiaries of SSDI and the ineffectiveness of current strategies to encourage work. While one in six SSDI beneficiaries say they would like to earn their way off the rolls within five years, the take-up rate for the Ticket to Work incentive is under 2 percent (Stapleton et al. 2008).

Huang and Schmeiser (2009) and Rutledge (2014) examine the likely impact of EITC expansions on people with work-limiting disabilities and find an increase in labor force participation among workers with resident children compared to those without. While the one percent increase estimated by Rutledge does not differ significantly from zero, it is consistent with a large impact on a subset of these individuals and no impact on most. He also finds an impact on the intensive margin, as workers with disabilities and resident children work more.

Gokhale (2014) proposes a more significant intervention, combining a refundable credit with dramatic changes in SSDI program rules that would eliminate the cliff in eligibility and instead impose a smooth effective tax on additional earnings starting with the first dollar. While this proposal would almost certainly encourage more work, the more effective it is, the more costly it becomes, and its main effect is to transfer program costs out of SSDI and into refundable tax credits, with different budget scoring rules. A policy that would deliver equivalent benefits monthly instead of annually could be administered through an altered Supplemental Security Income (SSI) program, which has no trust fund limitation but is scored as a spending program rather than a negative tax. Policy innovations through SSI could

be implemented through state waivers as well, to encourage state experimentation in developing the most effective innovation.

7. Conclusion

The EITC has large impacts on net incomes for low-income families who work and may dramatically improve well-being among children in those families. EITC expansions of the 1990's seem to have increased work among single parents, though they may have induced some secondary workers to cut back on work. Recent changes reducing marriage penalties may have increased marriage rates among some low-income families, and credits aimed at noncustodial parents seem to have increased work and payment of child support. The generally positive impacts found for the EITC have led to broad political support and a raft of proposals to expand its reach. However, much of the possible impact of EITC expansions was realized in the 1994-1996 expansion, and it is likely that further expansions would have smaller impacts at higher net cost.

The advantage of an earned income tax credit over a negative income tax, or equivalent transfer policy, depends on the effectiveness of the EITC at moving people into work. During an exceptionally weak job market, expanding the size of the EITC is less attractive as people induced to enter the labor market are more likely to move into unemployment rather than employment. Moreover, even in stronger markets some of the benefit of larger credits accrues to employers through reduced pretax wages, at least if the credits are not accompanied by increased minimum wages. Nevertheless, the political attractiveness of tax credits relative to spending programs appears undiminished. Thus, we should expect more policy variation in the future.

In the last decade, research on the EITC has broadened beyond the initial focus on single mothers' labor supply to consider a wide variety of other outcomes. Nevertheless, a few topics remain under-studied. Our priorities for future research would include a more nuanced understanding of the nature of intensive-margin labor supply responses, at a minimum distinguishing between changes in hours worked per week and weeks worked per year; further work on the impacts of the credit on child outcomes and on human capital investments (of both parents and children); and additional evidence regarding the incidence of the credit. Among new topics, the interaction of the EITC with new health insurance credits seems likely to be fruitful.

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Table 1. EITC Parameters, 1975-2014 (selected years; 2013$)

Calendar year	Credit rate (percent)	Minimum income for maximum credit	Maximum credit	Phaseout rate (percent)	Phaseout range [1]	
					Beginning income	Ending income
2015 [2]						
No children	7.65	6,580	503	7.65	8,240	14,820
One child	34.00	9,880	3,359	15.98	18,110	39,131
Two children	40.00	13,870	5,548	21.06	18,110	44,454
Three children	45.00	13,870	6,242	21.06	18,110	47,747
2014 [2]						
No children	7.65	6,480	496	7.65	8,110	14,590
One child	34.00	9,720	3,305	15.98	17,830	38,511
Two children	40.00	13,650	5,460	21.06	17,830	43,756
Three children	45.00	13,650	6,143	21.06	17,830	46,997
2009						
No children	8.31	6,483	496	7.65	8,111	14,594
One child	36.92	9,718	3,304	15.98	17,830	38,508
Two children	43.43	13,649	5,460	21.06	17,830	43,755
Three children	48.86	13,649	6,143	21.06	17,830	46,995
2003 [1]						
No children	9.69	6,318	484	7.65	7,900	14,218
One child	43.05	9,483	3,225	15.98	17,383	37,559
Two children	50.64	13,306	5,323	21.06	17,383	42,656
1996						
No children	7.65	6,266	480	7.65	7,839	14,105
One child	34.00	9,398	3,195	15.98	17,238	37,235
Two children	40.00	13,199	5,280	21.06	17,238	42,308
1995						
No children	7.65	6,267	480	7.65	7,842	14,109
One child	34.00	9,416	3,201	15.98	17,258	37,291
Two children	36.00	13,207	4,754	20.22	17,258	40,772
1994						
No children	7.65	6,288	481	7.65	7,860	14,147
One child	26.30	12,182	3,204	15.98	17,291	37,341
Two children	30.00	13,243	3,974	17.68	17,291	39,763
1993						
One child	18.50	12,494	2,312	13.21	19,668	37,160
Two children	19.50	12,494	2,436	13.93	19,668	37,160
1992						
One child	17.60	12,486	2,198	12.57	19,659	37,144
Two children	18.40	12,486	2,298	13.14	19,659	37,144
1991						
One child	16.70	12,212	2,039	11.93	19,242	36,346
Two children	17.30	12,212	2,112	12.36	19,242	36,346
1990	14.00	12,138	1,699	10	19,125	36,118
1987	14.00	12,468	1,745	10	14,191	31,646
1985–86	11.00	10,726	1,180	12.22	13,944	23,598
1979–84	10.00	12,995	1,299	12.5	15,594	25,990
1975–78	10.00	15,841	1,584	10	15,841	31,683

[1] Beginning in 2002, the beginning and ending points of the phase-out range were higher for married taxpayers filing jointly.
[2] 2014 and 2015 rows are in nominal dollars.
Source: Tax Policy Center,
http://www.taxpolicycenter.org/taxfacts/displayafact.cfm?Docid=36

Table 2. State EITCs in tax year 2014

State	Percentage of Federal Credit
Refundable Tax Credits	
Colorado	10 percent
Connecticut	30 percent
District of Columbia	40 percent
Illinois	10 percent
Indiana	9 percent
Iowa	14 percent
Kansas	18 percent
Louisiana	3.5 percent
Maryland	25 percent*
Massachusetts	15 percent
Michigan	6 percent
Minnesota	Average 33 percent
Nebraska	10 percent
New Jersey	20 percent
New Mexico	10 percent
New York	30 percent
Oklahoma	5 percent
Oregon	6 percent
Vermont	32 percent
Wisconsin	4 percent (one child); 11 percent (two children); 34 percent (three children)
Non-refundable Tax Credits	
Delaware	20 percent
Maine	5 percent
Ohio	5 percent
Virginia	20 percent
Partially Refundable Tax Credits	
Rhode Island	25 percent
City and County Tax Credits (refundable)	
New York City	5 percent
Montgomery Cty (MD)	72.5 percent state of Maryland credit

* Maryland offers a non-refundable credit of up to 50% of Federal EITC or a refundable credit of up to 25% of Federal EITC.

Source: IRS
http://www.irs.gov/Individuals/States-and-Local-Governments-with-Earned-Income-Tax-Credit

Table 3. Distribution of tax units across EITC schedule ranges, by primary taxpayer characteristics

	Percent receiving no EIC	Percent in phase-in region	Percent in plateau	Percent in phase-out	Mean EIC in phase-in region	Mean EIC in plateau region	Mean EIC in phase-out region
Qualifying children							
Zero	93.14	2.40	0.85	3.61	234	464	222
One	64.85	6.82	8.23	20.10	1499	3094	1572
Two	60.55	8.13	5.41	25.91	2744	5112	2660
Three or more	47.06	11.40	7.85	33.69	2983	5751	3394
Return type							
Joint, both <65	83.76	2.12	3.54	10.58	2259	3785	2296
Joint, one	90.80	1.80	2.95	4.45	982	1186	824
Joint, both 65+	99.32	0.24	0.09	0.35	1753	3660	2098
Head of household	31.89	18.01	10.46	39.65	2316	3989	2497
Single	91.45	3.35	0.68	4.52	235	477	221
Race/ethnicity of primary taxpayer							
White only	88.83	2.77	1.62	6.78	1200	2963	1734
Black only	74.79	7.37	3.73	14.11	1507	3386	1917
Hispanic	69.05	6.95	5.80	18.20	1882	3853	2105
Other	82.40	4.41	3.09	10.10	1344	3268	1801
Education of primary taxpayer							
Less than HS	64.32	10.29	7.01	18.38	1666	3634	2050
HS graduate	79.63	4.80	3.42	12.16	1476	3300	1920
Some college	84.09	3.89	2.20	9.81	1433	3407	1862
BA or better	93.41	1.56	0.85	4.19	974	2695	1546
Age of primary taxpayer							
Age 15-29	82.13	5.71	3.22	8.94	1513	3442	1875
Age 30-44	74.62	5.53	3.72	16.13	1730	4023	2154
Age 45-59	85.77	3.27	2.15	8.81	1070	2735	1543
Age 60-74	94.34	1.52	1.20	2.94	667	1251	864
Age 75 plus	99.21	0.24	0.13	0.42	1854	2525	1784

Source: Authors' calculations using CPS ASEC (March 2012) data.

Table 4. Characteristics of EITC recipient and non-recipient families and households

	Families				Households			
	No EIC in family		Positive EIC in family		No EIC in household		Positive EIC in household	
	% (column sums to 100)	Mean family sum of AGI	% (column sums to 100)	Mean family sum of AGI	% (column sums to 100)	Mean household sum of AGI	% (column sums to 100)	Mean household sum of AGI
Qualifying children in larger unit								
Zero	62.16	63,730	16.42	28,332	59.87	71,980	15.42	37,923
One	3.47	44,200	13.34	22,165	3.75	60,068	13.20	40,196
Two	13.29	99,957	23.56	28,748	14.08	102,807	22.89	38,548
Three	1.46	21,063	14.47	22,256	1.67	36,452	14.86	31,781
Four or more	19.62	119,064	32.22	30,352	20.64	119,858	33.62	37,983
Race/ethnicity								
White only	68.83	33,315	41.56	8,899	69.72	90,788	41.91	39,562
Black only	10.80	21,276	16.67	7,159	10.69	57,949	16.34	30,271
Hispanic	12.77	19,464	32.98	7,068	12.08	69,295	32.86	37,627
Other	7.59	28,007	8.79	6,863	7.52	97,134	8.89	40,304
Education								
Less than HS	28.09	3,674	56.16	2,506	27.84	83,308	53.64	33,747
HS graduate	23.45	24,679	20.65	13,151	23.11	58,895	22.07	38,359
Some college	23.28	31,757	16.10	14,442	23.33	76,957	16.79	41,231
BA or better	25.19	62,062	7.09	19,443	25.72	118,211	7.49	53,117
Age								
Age 0-14	15.67	94,831	35.61	24,764	15.77	101,177	32.90	33,331
Age 15-29	19.65	73,168	24.85	28,822	19.10	86,266	26.03	39,260
Age 30-44	18.98	86,625	21.53	27,602	18.93	95,200	21.39	38,423
Age 45-59	22.86	91,284	13.19	29,686	22.97	96,676	13.98	40,704
Age 60-74	15.61	60,867	4.14	31,490	15.82	64,501	4.82	41,898
Age 75 plus	7.22	28,371	0.68	34,837	7.40	30,896	0.88	40,906

Source: Authors' calculations using CPS ASEC (March 2012) data.

Table 5. Children in households receiving and not receiving EITC, percent with characteristic

	No EIC in household	EIC in household
Qualifying children in larger unit		
Zero	3.26	0.17
One	7.34	11.36
Two	26.50	22.37
Three	5.93	21.97
Four or more	56.98	44.14
Race/ethnicity		
White only	62.47	37.32
Black only	11.26	17.75
Hispanic	16.58	35.54
Other	9.69	9.39
Education		
Less than HS	4.62	20.33
HS graduate	19.18	34.26
Some college	28.70	32.51
BA or better	47.50	12.90
Family type		
Single mom	23.24	58.01

Source: Authors' calculations using CPS ASEC (March 2012) data.

Table 6. Number of EITC claims and dollars spent, 2010 and 2011, IRS data vs. Current Population Survey

Number of qualifying children	IRS 2010 Number of returns, millions	IRS 2010 Earned income credit, millions of dollars	CPS 2010 Number of returns, millions	CPS 2010 Earned income credit, millions of dollars	Percent of returns represented : CPS/IRS	Percent of dollars represented : CPS/IRS
0	6.647	1,753	6.384	1,581	96.03	90.20
1	10.001	21,014	5.141	9,460	51.40	45.02
2	7.335	24,601	5.102	14,807	69.55	60.19
3+	3.384	12,195	3.946	14,272	116.61	117.03
All	27.368	59,562	20.573	40,119	75.17	67.36

Number of qualifying children	IRS 2011 Number of returns, millions	IRS 2011 Earned income credit, millions of dollars	CPS 2011 Number of returns, millions	CPS 2011 Earned income credit, millions of dollars	Percent of returns represented: CPS/IRS	Percent of dollars represented: CPS/IRS
0	6.886	1,821	6.528	1,672	94.80	91.83
1	10.094	22,201	5.357	10,253	53.07	46.18
2	7.498	26,010	5.166	15,557	68.90	59.81
3+	3.433	12,874	4.050	14,778	117.95	114.79
All	27.912	62,906	21.101	42,260	75.60	67.18

Source: http://www.irs.gov/uac/SOI-Tax-Stats-Individual-Income-Tax-Returns and authors' calculations using CPS ASEC (March 2012) data.

Table 7. Incidence of the EITC, per dollar spent

Group	Intended EITC transfer	Change in earnings due to Labor supply	Wages	Total	Change in after-tax income	Change in welfare
Single women						
With children	+0.55	+0.35	-0.31	+0.04	+0.59	+0.24
Without children	0	-0.20	-0.23	-0.43	-0.43	-0.23
Employers						+0.54
Married women						
With children	+0.45	-0.10	+0.14	+0.04	+0.49	+0.59
Without children	0	+0.04	+0.05	+0.09	+0.09	+0.05
Employers						-0.19

Source: Rothstein (2010), Table 5. Assumes an extensive-margin labor supply elasticity of 0.75, an intensive-margin elasticity of 0, and a labor demand elasticity of -0.3. Also assumes labor markets are segmented by gender, skill, and marital status.

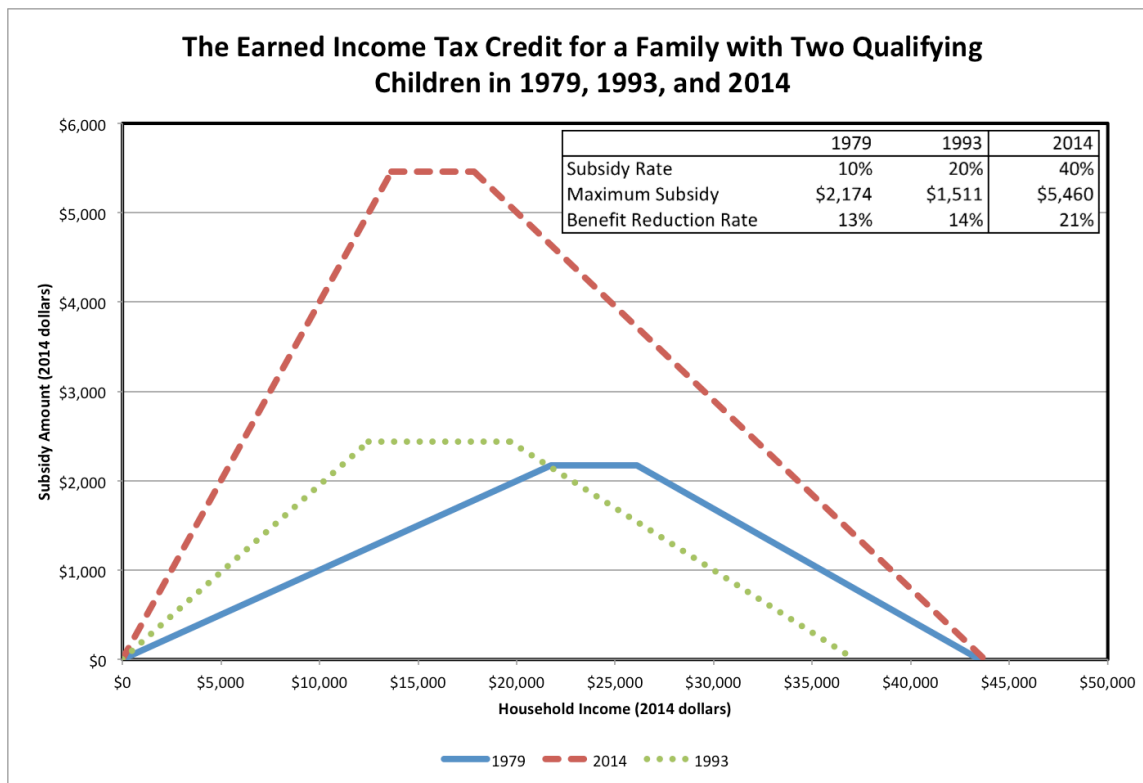Figure 1. EITC Schedule for Single Parents with Two Qualifying Children, 1979, 1993, and 2014.

The Earned Income Tax Credit for a Family with Two Qualifying Children in 1979, 1993, and 2014

	1979	1993	2014
Subsidy Rate	10%	20%	40%
Maximum Subsidy	$2,174	$1,511	$5,460
Benefit Reduction Rate	13%	14%	21%

Figure 2. Maximum credit over time, constant 2013 dollars, by number of children
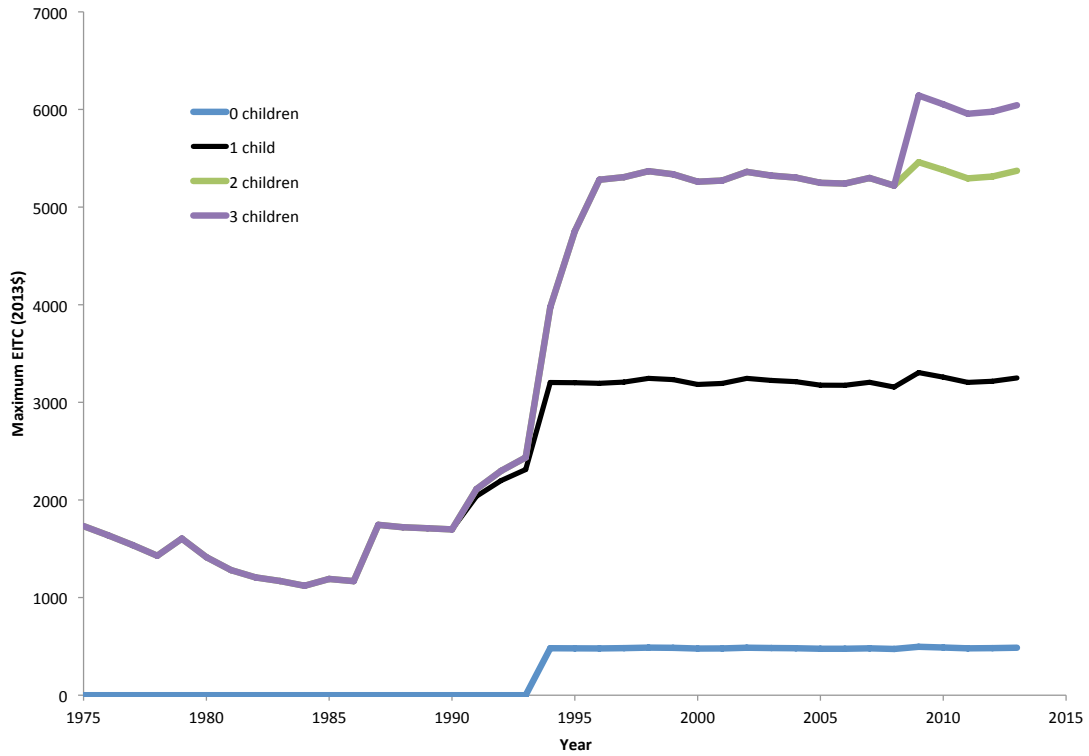
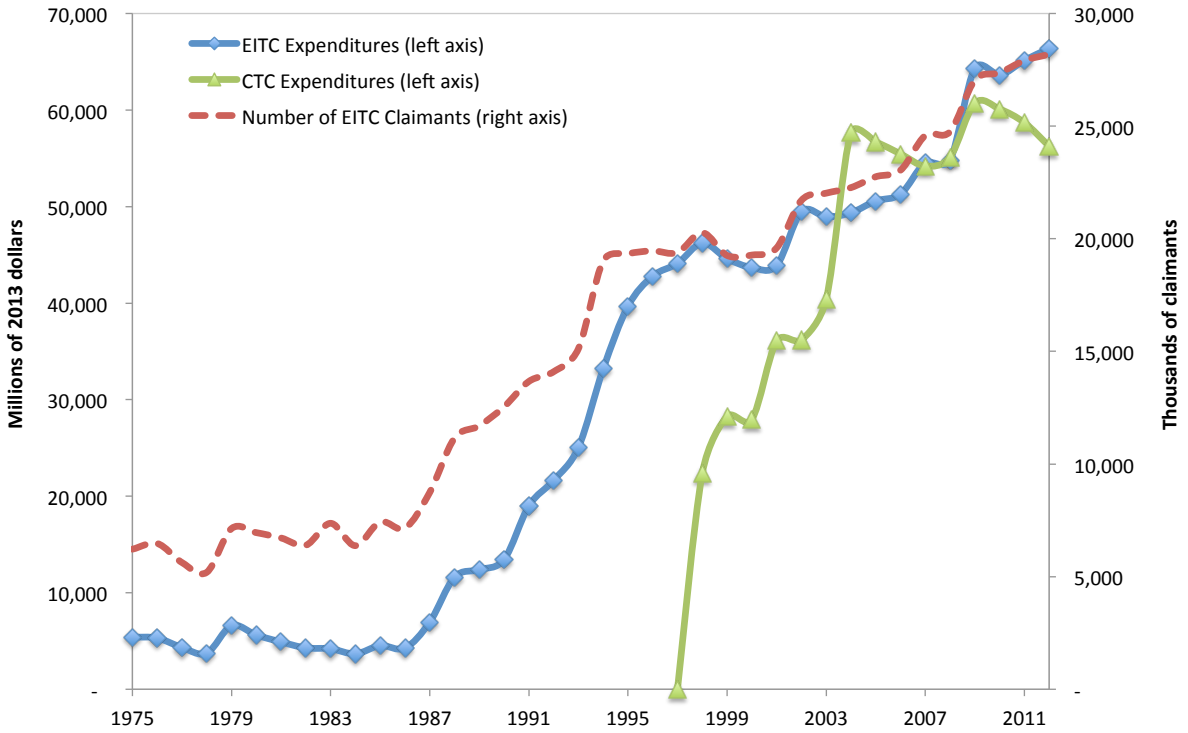Figure 3. Combined EITC & Additional Child Tax Credit Schedules
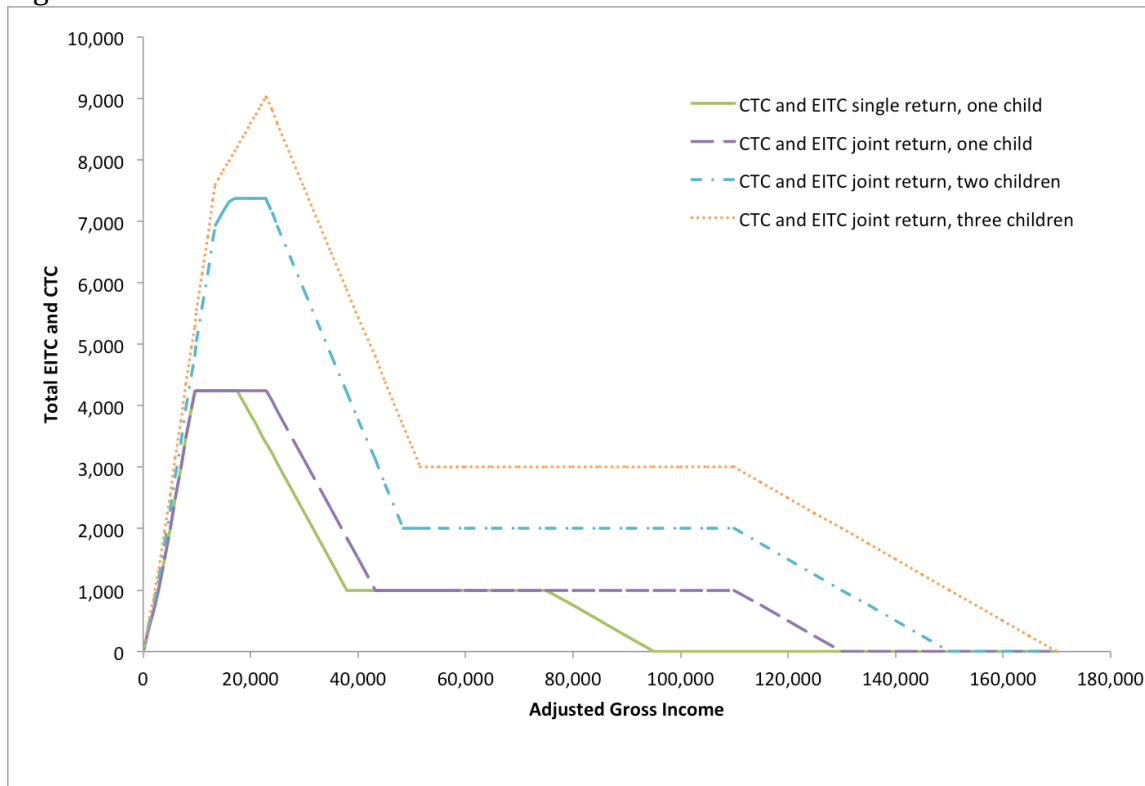
Figure 4. Effective marginal tax rates combining multiple programs
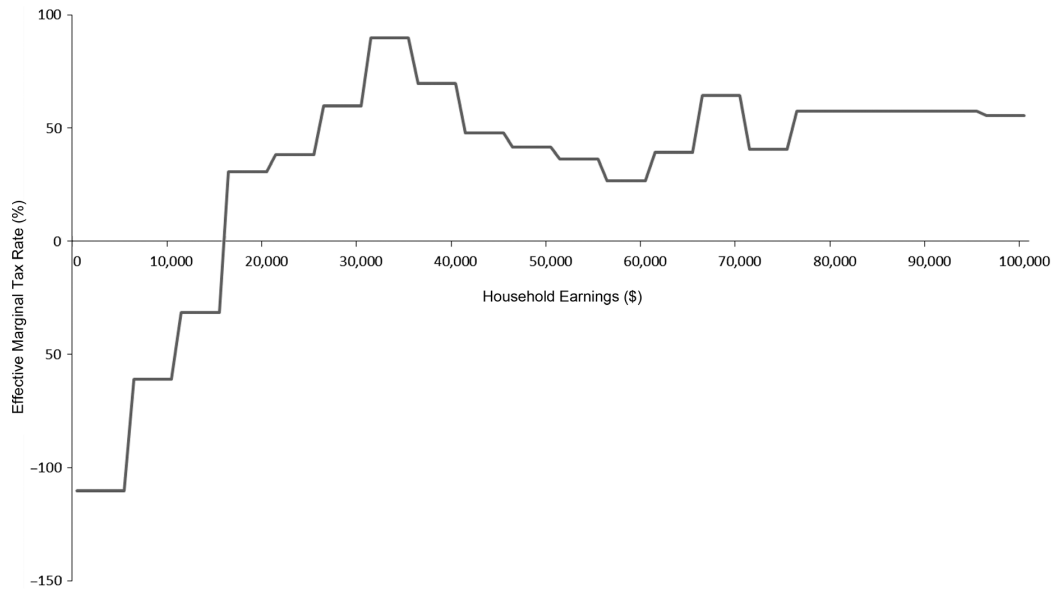
Source: Maag et al. (2012), Figure 2. Effective marginal tax rates are for a single parent with two children in Colorado.

Figure 5. Number of EITC recipients and total EITC and CTC outlays, by year

Source: IRS

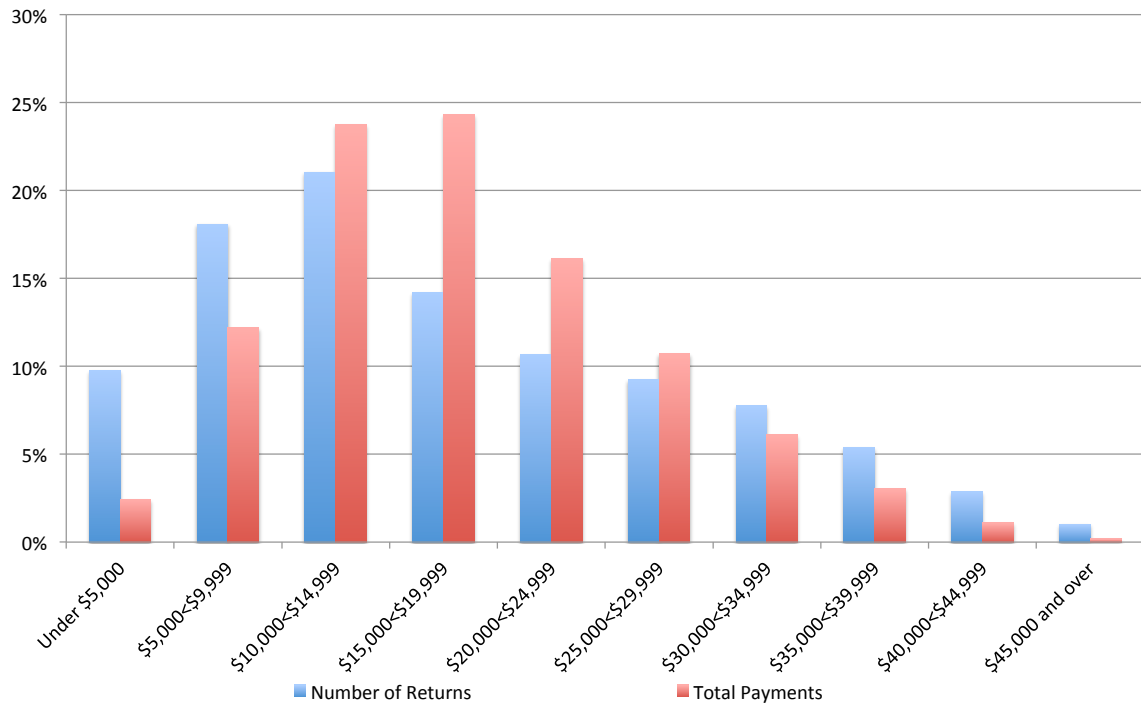Figure 6. Distribution of EITC returns and payments by income level, 2012

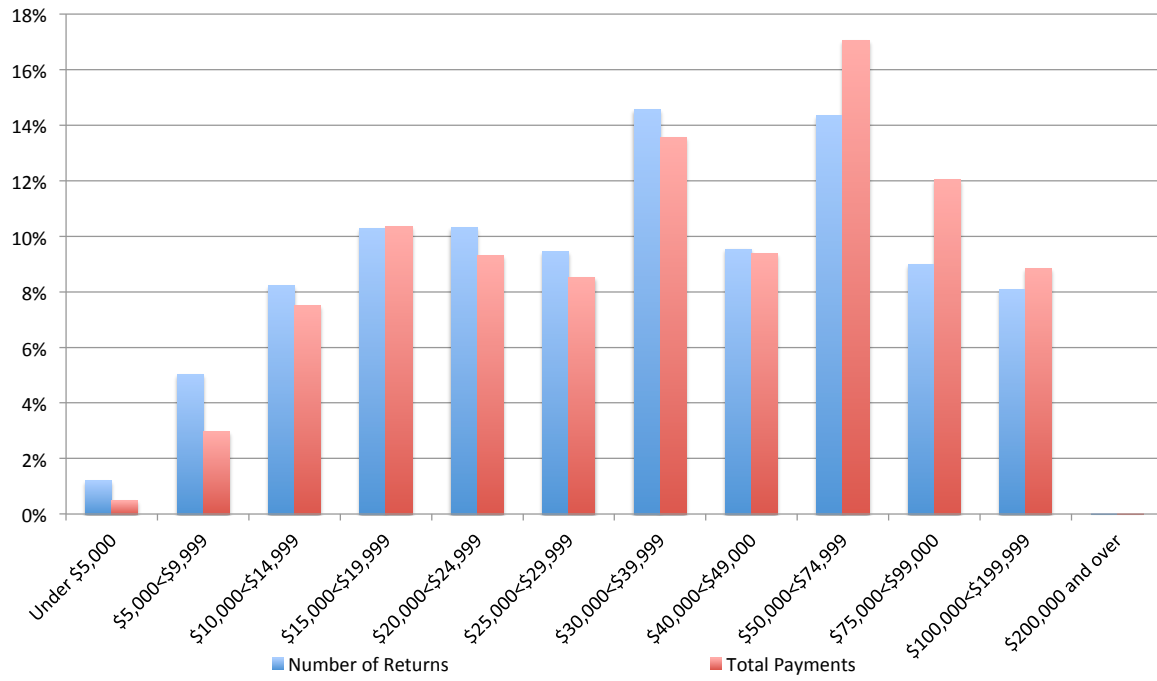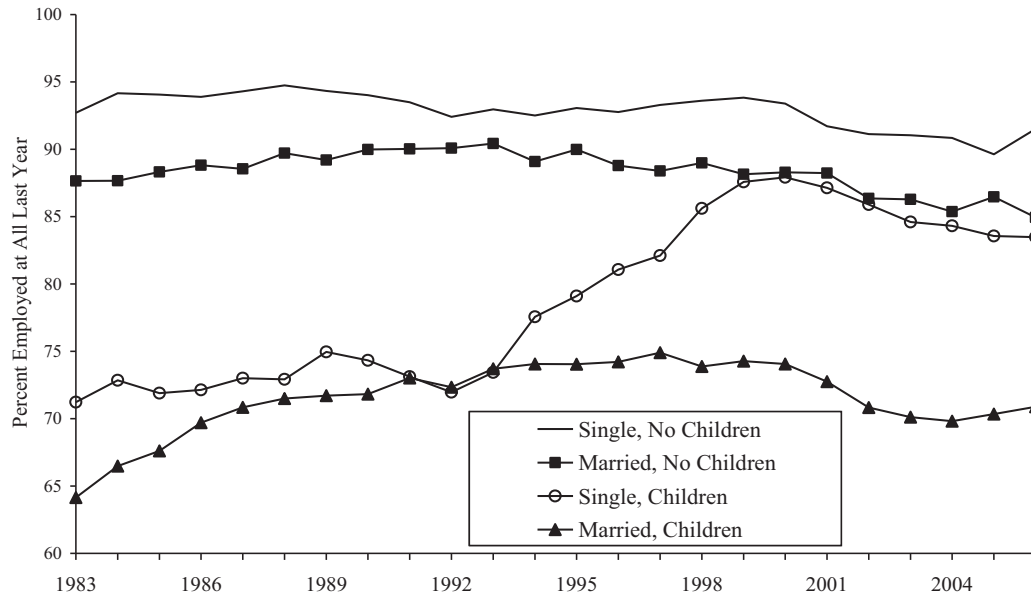Figure 7. Distribution of CTC returns and payments by income level, 2012

Figure 8. Annual Employment Rate for Women, by Marital Status and Presence of Children, 1983-2006 (from Eissa and Hoynes 2011)

Notes: The sample includes all women age 19–44 who are not in school or disabled. We also drop the relatively small number of women who report working positive hours but have zero earnings or report positive earnings but zero hours. For these calculations, employment is defined by any work over the (prior) calendar year.
Source: Authors' tabulations of 1984–2007 March Current Population Surveys.

Figure 9. Non-linear income taxes and bunching

Consumption

Person C

Ineligible:
slope=w

Phase-out:
slope=w(1-t2)

Person B

Plateau:
slope=w

Person A

Phase-in:
slope=w(1-t1)

No   With
EITC   EITC

No   With
EITC   EITC

With or
without
EITC

Leisure

Earnings