The Earned Income Tax Credit[1]

Austin Nichols
DeBruce Foundation
and Urban Institute

and

Jesse Rothstein
University of California, Berkeley
and NBER

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[1] austinnichols@gmail.com and rothstein@berkeley.edu. We thank Apurna Chakraborty and Darian Woods for excellent research assistance. The paper has benefitted from comments and suggestions from Richard Blundell, Chye-Ching Huang, Robert Greenstein, Hilary Hoynes, Chuck Marr, Robert Moffitt, Emmanuel Saez, Arloc Sherman, and John Wancheck, though none are responsible for the content. We are especially grateful to Margaret Jones of the U.S. Census Bureau for providing the tabulations of non-public matched CPS-IRS data discussed in Section 3.

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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. Introduced in 1975, it has grown to be one of the largest and least controversial elements of the U.S. welfare state, with 26.7 million recipients sharing $63 billion in total federal EITC expenditures in 2013. Moreover, the federal EITC is supplemented by the Child Tax Credit, which has a similar structure and is comparable in size (though more tilted toward higher-income families), and by state and local EITCs in at least 25 states and several municipalities.

Judged as an anti-poverty program, the EITC is extremely successful. Hoynes and Patel (2014) find that EITC receipt is concentrated among families whose incomes (after other taxes and transfers) would otherwise be between 75% and 150% of the poverty line. An analysis of the new Census supplemental poverty measure (Short 2014), designed to include the effects of transfer programs on families' disposable income, indicates that income from refundable tax credits (primarily but not exclusively the EITC) reduces the number of people in poverty by over 15%. The impact on children is even more dramatic: Income from refundable tax credits reduces child poverty by over one-quarter. No other program – save perhaps Social Security retirement benefits – approaches this impact. Moreover, as we discuss below, the income that the EITC provides has important impacts on parent and child health, and on children's academic achievement.

For all its size and importance, 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, prominent members of both parties have called for EITC expansions. Then House of Representatives Budget Committee Chair (now Chair of the Ways and Means Committee) 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. President Obama's 2016 budget proposal includes similar expansions. It is reasonable to suspect that Ryan and Obama do not agree on much else where means-tested transfers are concerned.

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 government caseworkers, and take-up rates are substantially higher than in many other anti-poverty programs. On the other hand, recipients often rely on for-profit tax preparers, sometimes paying high fees to have their tax returns prepared or for short-term loans against their eventual EITC refunds. And where a common critique of means-tested transfers is that they create incentives to masquerade as a person of limited means, by reducing labor supply, the EITC's primary incentive is to *increase* labor supply. Indeed, one

concern about the EITC is that it may induce too labor supply in the targeted population, reducing wages and allowing employers of low-skill workers to capture a portion of credit expenditures.

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 then, the literature has become even 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 younger and 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. 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 that the EITC might be expected to create, as well as concerns about interactions with other programs and with cyclical variation.

Section 5 reviews the empirical literature regarding 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. Take-up 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 speed access to tax refunds but charge very high interest rates.[2]

[2] As we discuss below, pressure from federal bank regulators has sharply curtailed the supply of refund anticipation loans, which are widely seen as usurious.

Next, we turn to studies of the effects of the credit on recipients' well being. Researchers have documented beneficial effects on poverty, on consumption, on health, and on children's academic outcomes. The magnitude of these effects is large: Millions of families are brought above the poverty line, and estimates of the effects on children indicate that this may have extremely important effects on the intergenerational transmission of poverty as well. Taking all of the evidence together, the EITC appears to benefit recipients – and especially their children – substantially, though there is some evidence of unintended consequences (on, e.g., marriage and fertility) as well.

Third, we consider the impact of the credit on the labor market. There is an overwhelming consensus in the literature that the EITC raises single mothers' labor force participation. There is also evidence of a *negative*, but smaller, effect on the employment of married women, who may take advantage of the credit to stay home with their children. There is little evidence of any effects on men, and estimated effects on the number of weeks or hours that women work, conditional on participating at all, are much smaller than those on participation. Indeed, most evidence on the intensive margin derives from effects on *reported* earnings among self employed workers who face negative marginal tax rates and thus incentives to inflate their earnings, which are difficult to verify, though we discuss some recent work that finds evidence of effects on the non-self-employed as well.

Section 5 also considers the EITC's effect on pre-tax wages. Standard tax incidence models emphasize that the economic impacts 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 purchasers of the subsidized product – labor – rather than on the sellers. This fact was not prominent in early discussions of the EITC, but has been the subject of several studies in the last decade. Although none of the evidence is airtight, it appears that employers of low-wage labor are able to capture a meaningful share of the credit through reduced wages. This comes to some extent at the expense of low-skill workers who are not eligible for the credit (due, e.g., to not having children; although there is a credit schedule for childless workers, it is much less generous than that for families with children).

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, because the credit is computed based on calendar-year earnings, partial year unemployment would be expected to generate larger credits for many recipients (whose credits are declining in their earnings) and to make many others eligible who would not have qualified 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. 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 one another. But it is

not clear that the two should be seen as alternatives, as tax incidence considerations may create important complementarities between the two: In the absence of a binding minimum wage, EITC-induced labor supply increases drive down the market wage, enabling employers to capture a portion of the credit. A higher minimum wage can thus make the EITC more effective. 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.

The EITC has evolved substantially since its introduction: 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 and more generous for married couples than for single parents (though these provisions are set to expire in 2017); 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 non-custodial parents or to childless tax filers (who currently are eligible for a maximum credit of less than 10% that available to 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), Moffitt (2003; 2010), and Hotz and Scholz (2003). Our brief discussion here cannot do it justice, and readers are referred to those studies – on which we draw heavily – 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 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 sometimes got worse: Those who participated in multiple programs could face extremely complex effective tax schedules, with many "cliffs" where marginal rates were well in excess of 100%. Average effective tax rates, while generally lower, were nevertheless quite high. A recipient subject to such a schedule, with

most of her potential earnings subject to clawback as her benefits phased out, might reasonably decide to remain out of work 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 would 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.[3] President Nixon proposed an NIT, the Family Assistance Plan (FAP), in 1969.

But NITs have two important drawbacks. First, they are extremely expensive, with many benefits going to non-employed individuals who might not face great need (e.g., to early retirees or those in school). Second, like welfare they permit some individuals to withdraw voluntarily from work in order to live on the dole. Thus, while the disincentive to enter the labor market is smaller than with traditional welfare, for many observers even an NIT would not do enough to promote work. Indeed, it is not necessarily the case 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, where traditional welfare had rules designed to require work from those who were able, the NIT can be seen as legitimizing the choice not to work. 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.

[3] 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 NIT. Nevertheless, NIT proponents – in particular Friedman, 1966 – were hostile to GAIs (Ventry 2000, footnote 17).

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 $0.25 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.

Long's work bonus was finally enacted in 1975, with his originally proposed subsidy rate of 10% and $400 maximum credit but with a lower, 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 was re-authorized, and was made 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 maximum 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.

Perhaps the most notable change in the EITC's history came as part of the 1993 budget. In his first State of the Union address, President Clinton announced 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 for whom the credit was roughly doubled. 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.

The 1993 budget also included a conceptually important change in the program, introducing a credit schedule for families without children. The maximum credit was only $481 (in 2013 dollars), about 15% of the one-child maximum, and the credit phased out at a very low income (just over $14,000 in current dollars). Another conceptually important change was introduced in 2002, when separate (though not wildly different) schedules were introduced for married couples than for single parents. As we discuss below, further modifications along these lines are at the center of current discussions about EITC reform.

The final set of changes to date came with the American Recovery and Reinvestment Act (ARRA) of 2009. Maximum credits were increased slightly; a new, more generous schedule was introduced for families with three or more children; and the married couple schedule was extended substantially in an effort to reduce marriage penalties for two-earner couples. All of these were made as temporary changes, originally set to expire in 2010 but since extended to 2017.

Figure 1 provides one illustration of the growth of the program. It shows the EITC schedule for a single parent with two qualifying children in 1979, 1993, 1996, and 2014, with both incomes and credits converted to real 2013 dollars. The real maximum value of the credit was 52% higher in 1993 than in 1979, though in 1993 the maximum credit was attained with a lower real income and the phase-out range extended to a higher level. By 1996, the real value of the credit had more than doubled, and the maximum income at which the credit could be received had risen further still. One implication is that marginal tax rates for most recipients – the slope of the sides of the schedule trapezoids –roughly doubled between 1993 and 1996, becoming more negative for those with very low incomes and more positive for those with higher incomes. Changes since 1996 – at least for single parent families with two children, as depicted here – have been minimal, and the 2014 schedule is quite similar to that in 1996.

Figure 2 provides another look at the program's history. It again shows that the 1993 expansion (phased in through 1996) was by far the most dramatic in the program's history. We can also see here substantial expansions in 1986, 1990, and (only for families with three or more children) 2009.

Not visible in either figure are changes in the married-couple schedules starting in 2002. 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 head-of-household (single parent) filers 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). 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, the CTC's broader reach means that total expenditures are comparable ($55 billion for the CTC vs. $64 billion for the EITC in 2012).

The CTC, unlike the EITC, 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 those. 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. This threshold was initially set at a relatively high level, preventing most low income families from receiving meaningful refunds via the CTC. But in 2009, 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, making the schedule similar to the EITC's. Like the ARRA EITC provisions, the reduced CTC threshold was originally set to expire at the end of 2010, but has since been extended through 2017.

Figure 3 shows the combined schedules of the EITC and CTC by family type, counting only the refundable portion of the CTC for low-income families. (The credit calculations assume that families have zero unearned income or exclusions from Adjusted Gross Income.) It shows that the CTC's schedule has the same trapezoidal structure as the EITC, but that it extends much farther into the income distribution.

2.2. Rules

2.2.1. Eligibility

Eligibility for the EITC is based on the family structure and the family's earnings and income.

The primary family structure criterion 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 or his or her sibling; and a resident of the household for at least half of the tax year.[4] When the EITC was introduced, it was available only to families with qualifying children. A more generous credit for families with two or more qualifying children was added in 1991, and a yet more generous credit for those with three or more children was added in 2009 (though the latter is currently set to expire in 2017). Since 1994, families without qualifying children can be eligible for the credit, but the childless credit remains much less generous than that for families with qualifying children (Figure 2).

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

[4] As with many aspects of tax rules, there are exceptions and qualifications that apply to unusual cases. We do not attempt to be comprehensive.

residency and support. Most importantly, non-custodial parents are generally ineligible for the EITC, even if they provide substantial support to the child, but can in some circumstances claim children as dependents. (Recent changes to the dependency criteria have reduced non-custodial parents' ability to claim children as dependents, narrowing but not eliminating the discrepancy.) 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). In 2014, this threshold was $48,378 per year for a family of two children with two parents filing jointly. Importantly, the relevant income measures are those for the tax-filing unit. Thus, for married couples both spouses' earnings count toward the threshold.

There are also secondary criteria that are less central to the design of the program. The parents' tax filing and marital status affects EITC eligibility: Non-filers and married couples who file separately cannot claim the EITC, and since 2002 married couples who file jointly are subject to a somewhat more generous credit than are head-of-household (unmarried) filers.

Finally, families with unearned income (e.g., interest or dividends) can be ineligible for the EITC even if earnings are below the threshold. Families with total income from interest, rent, dividends, capital gains, and other "passive" sources above $3,300 are ineligible for the credit, as are those with adjusted gross income (AGI – roughly equal to total taxable income) above the earned income 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 with low incomes, 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 (IRS, 2014a).

The portion of the EITC in excess of tax liabilities is distributed as a lump sum following the filing of the family's tax return just as if withholding was set too high. Not surprisingly, EITC recipients tend to file their returns earlier than do other families, and the majority of EITC refunds are distributed in February. The IRS typically issues refunds within a few weeks.

A substantial majority of EITC claimants use third-party tax preparers to file their tax returns (Chetty, Friedman, and Saez, 2013; Greenstein and Wancheck, 2011). Some receive assistance from non-profit tax preparation services, such as the Volunteer Income Tax Assistance (VITA) program, though many use for-profit services, of which H&R Block is perhaps the best known. The EITC has supported rapid growth in for-profit tax preparation services in low-income neighborhoods. These services typically charge modest fees for preparing returns, but in the past have made much of their revenue from expensive "refund anticipation loans" (RALs), originated by the tax preparer or by an affiliated bank, that provide the tax refund (including the refundable EITC) immediately upon filing the return.

These speed access to the refund by only a few weeks, and often carry usurious effective annual interest rates.

The IRS estimates that 15 million EITC recipients used paid tax preparers in 2013, and one study estimates total tax preparation fees at $2.75 billion (IRS SPEC, 2014; Wu, 2014). Fees and interest for RALs and other forms of loans against returns amounted to perhaps $500 million more (IRS SPEC, 2014; Wu, 2014). Combining these, fees accounted for about 5% of total EITC expenditures. This is a substantial reduction from years past, due largely to a sharp reduction in RALs since 2007 (IRS SPEC, 2014; Wu, 2014); this in turn is due in large part to bank exit from the RAL market following a crackdown by bank regulators. To put EITC fees in context, 5% is much smaller than the administrative share of costs for traditional transfer programs, implying that a larger share of EITC expenditures reach recipients, though the EITC is unusual in that much of the administrative cost is borne by recipients rather than by the government.

Since 2012, no traditional bank has offered RALs. Although RALs are still available from some non-bank lenders (such as tax preparation firms), their prevalence has fallen by a factor of ten or more (IRS SPEC, 2014; Wu, 2014). They have been replaced by an alternative product, the Refund Anticipation Check (RAC), which facilitates access to refunds for recipients without checking accounts at a cost about half of that of an RAL.

From 1979 to 2010, the IRS offered an alternative mechanism for delivering the credit, known as the "Advance EIC." Recipients who expected to receive an EITC could sign up 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, though 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 (GAO, 2007), and was eliminated beginning in tax year 2011. We discuss potential explanations for the unpopularity of the Advance EIC in Section 5.2.

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, though eligibility for the CTC depends on only adjusted gross income (AGI), not on earnings and the credit is not refundable unless earnings exceed a threshold (set at $3,000 since 2009). The CTC reaches much farther into the income distribution, however: 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).

2.2.4. State EICs

A number of states have incorporated Earned Income Credits into their own income tax systems. Typically, these are refundable (or sometimes non-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 2014b). These states are listed in Table 2. New York City and Montgomery County, Maryland, have also adopted sub-state credits.

Because state and local credits are (nearly always) specified as shares of the federal credit, recipients 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 are produced by the federal schedule alone.

A few states have experimented with credits that go beyond a partial match of the federal credit. In particular, New York State and Washington DC have also introduced EITCs for non-custodial parents, who are not generally eligible for the federal credit.

2.2.5. 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. 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 negative paycheck deductions. 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, though there is typically a grace period (of around 9-12 months) after receipt. Following the 2008 Farm Bill, tax refunds that are deposited in qualified retirement plans and education savings accounts do 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.

When EITC recipients participate in other programs as well – a particularly common situation since the recent recession (Nichols and Zedlewski 2011) – the total effective marginal tax rate (MTR) can be much different than the relatively simple schedule illustrated in Figure 1. This can dramatically alter marginal incentives. Indeed, many authors (e.g., Moffitt 2003) have emphasized the possibility that the negative MTR

associated with the EITC's phase-in may serve to offset positive MTRs created by other programs.

Maag et al. (2012) calculate total effective marginal tax rates (due to taxes and benefit reductions) across a wide variety of programs. Figure 4 reproduces their Figure 1, showing how the combined value of all universally available taxes and transfers varies with earnings for single parents with two children in Colorado. It is clear here that the EITC is only a small part of the overall picture. At the same time, the EITC phase-in, plateau, and phase-out are clearly visible even in the cumulative tax and transfer schedule (represented by the top line in the figure), mostly because the EITC phase-in ends before the phase-out of the other programs really begins to affect net income.

Additional complexity comes from other taxes and non-universal programs, not included in Figure 4. Most obviously, essentially all earners will pay payroll taxes on the first dollar earned. The combined tax rate for federal payroll taxes is 7.65% if only the worker's share is counted or 15.3% if the employer share is counted as well. The latter offsets just over one-third of the negative phase-in MTR for a two-child family. State payroll taxes (e.g., unemployment insurance taxes, levied on the employer) would add a bit more to this.

Maag et al. (2012) extend their analyses to include state income taxes and TANF, each of which varies by state, along with state rules for the universal programs (including, e.g., variation in fair market rents, used for SNAP benefit calculations). When they do this, they find wide variation across states and families. 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 with ACA credits). The mean effective MTR, across states, is positive but small at low incomes, but many states have substantially negative effective MTRs while others have large positive rates. 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. One implication is that for some families the EITC phase-in rate does serve to offset positive effective marginal tax rates (including benefit reduction rates) arising for other programs. But this holds only in some states, and only for families that participate in all possible programs. This is unusual. In more typical cases the net marginal tax rate is substantially negative in the EITC phase-in range.

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). Indeed, the Department of the Treasury (Treasury Inspector General for Tax Administration, 2011) estimates that EITC administrative costs are only about 1% of benefits provided, much less than for other programs (which can have administrative costs as high as 20%).

Noncompliance issues with the EITC center around three factors that are *not* covered by third-party information returns: Claiming of the credit based on non-qualifying children, self-employment income, and filing status.

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 (though 2004 changes to dependency rules moved the two set of criteria closer to harmony). As we discuss in Section 5.2, a large share of EITC noncompliance occurs when a non-custodial parent claims the credit based on a child who does not qualify due to the residency test.

Another substantial portion of noncompliance appears to derive from the *over*-statement of income among the self-employed, who gain more in additional EITC by increasing reported income to the end of the phase-in region than they lose through other tax obligations. A third category occurs when taxpayers claim the wrong filing status: A head-of-household return that claims the EITC becomes noncompliant if the IRS judges that it should have been filed as married-filing-separately.

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. It should be noted, though, that 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 former's reduction in tax liability is less salient to some Congressional observers than is the latter's increase in payment, though the impact on the federal budget is identical.

2.3. Comparison to other countries

The U.S. EITC has parallels in programs in place in many other developed countries. One that is often discussed is the United Kingdom's Working Families Tax Credit (see, e.g., Blundell and Hoynes 2004). Like the EITC, it is available only to those who work. It does not have a phase-in negative marginal tax rate, however; rather, it is available only to those who meet minimum weekly hours requirements.

Enumerating the universe of EITC-like programs (often referred to as "In-Work Tax Credits") is difficult, as similar tax structures can appear quite different depending on how the different portions are labeled. (Consider, for example, the "program" consisting of the combination of payroll taxes, the EITC, and the TANF and food stamps benefit phase-outs.) Table 3 presents one effort to enumerate EITC-like programs in the OECD. We restrict attention to programs that are generally available (so not limited to, e.g., the long-term unemployed) and either refundable or small enough to be fully offset by other taxes. There is a great deal of heterogeneity here. The U.S. program stands out as more generous than many and as having one of the largest phase-in rates.

3. Program statistics

The number of EITC recipients and aggregate EITC outlays have both grown sharply since the program's introduction. Figure 5 shows these two series. There are notable spikes in 1988, 1991, 1994-6, 2000, and 2009, each due to changes in the EITC schedule. A

comparable series for CTC outlays is shown as well. Here, we see a sharp increase following 2003 tax law changes but relative stability since 2004.

Figures 6 and 7 show the distribution of EITC and CTC recipient returns and expenditures by income level.[5] (Note that the two figures use somewhat different income bins, and that the CTC figure does not show counts of households due to the difficulty of counting unduplicated participation in the refundable and non-refundable portions.) 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 payments go to families with incomes above this point. Fully 8.8% of payments go to families with incomes above $100,000.

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 4 shows the distribution of tax units across EITC schedule ranges in the 2012 CPS ASEC, by the characteristics of the tax filer and the filing unit. 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. Tax filers who are non-white, who have less education, and who are of child-rearing age are all overrepresented among EITC recipients.

An important caveat to these data – and to all CPS-based analyses of EITC recipients – 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 may lead to errors: In some cases, the CPS will impute the credit to families that are ineligible or that do not claim the credit, and in other cases the CPS will fail to assign the credit to a family that in fact receives it. The dimensions of these potential errors are not well understood, despite the large amount of EITC research that depends on CPS imputations of credit participation.

Table 5 presents aggregate comparisons. We show estimates of the number of tax returns and the total credit received by families with different numbers of children, first using IRS records and then using the CPS. The CPS yields only about three-quarters as many EITC recipient families as are seen in the tax return data, and only about two-thirds as much spending. Relative undercounts in the CPS are concentrated among one and two child families; families with three or more children are overcounted in the CPS, while those with zero children are roughly comparable between the two sources. It is not clear, however, whether discrepancies reflect misclassification of families or misreporting of income in the CPS, or over-claiming of the credit on tax returns.

To shed further light on the limits of the CPS imputation, we turn to tabulations of CPS data, linked at the tax unit level to actual tax returns (Jones 2015).[6] Columns 2 and 3 of

[5] IRS statistics treat the CTC and the Additional CTC (the refundable portion) as separate programs, so it is not possible to compute counts of unduplicated tax returns. Our estimates of expenditures combine the value of CTCs used to offset other taxes with the value of Additional CTC refunds.

[6] We are extremely grateful to Margaret Jones of the Census Bureau for providing these tabulations. They are based on 75,963 tax return records and 115,281 W-2 records

Table 6 estimate the characteristics of EITC-eligible taxpayers, first using the CPS income measures to impute eligibility and then repeating the imputation using tax values. Characteristics of all tax units are shown in Column 1 for comparison. In these columns, entries represent column percentages within each type of characteristic.

Columns 4 and 5 of Table 6 present another type of comparison. In column 4, we show the likelihood that a tax unit who is eligible for the EITC using the tax values will also appear to be eligible when CPS values are used, while column 5 presents the converse. The low probabilities in columns 4 and 5 may raise questions about the validity of CPS imputations, but the same probabilities seem relatively high when we take into account the high prevalence of discrepancies in reported and matched administrative data on earnings in most surveys (Nichols, Smith, Wheaton 2011; Cristia and Schwabish 2009). The consistency of EITC imputations based on reported or matched earnings are also high relative to comparisons of reported and matched data on transfer income (e.g., Meyer, Mok, and Sullivan 2009; Mittag and Meyer 2014). Nevertheless, the low concordance of survey and administrative measures of EITC eligibility are important to bear in mind when assessing the validity of studies based on a survey measure of EITC eligibility or receipt. Fortunately, although individual-level concordance between the two data sources is quite imperfect, Columns 2-3 suggest that analyses of the average characteristics of EITC recipients are not likely to be affected dramatically by this.

4. Review of issues surrounding the program

In this section, we review a number of issues related to the program. We focus on issues that might arise in theory, assuming optimizing agents with full information and the ability to choose labor supply continuously with a fixed wage, and use these to discuss potential rationales for the program's structure. The assumptions are obviously unrealistic. Section 5 discusses the empirical evidence regarding many of the predicted impacts; while many have support in the data, for others – particularly those regarding changes in the hours of work of those who are participating in any case – the evidence is weaker.

4.1. Labor supply incentives

As noted above, the EITC's treatment of non-workers is an important source of its popularity among politicians and policymakers, for two related reasons: credits go to poor workers and not to poor (unmarried) non-workers who can be demonized as "takers," and the credit does not penalize work the way that more traditional programs often do. But labor supply disincentives can only be shifted around, not totally avoided, in means tested transfers, and the incentives created by the EITC are complex. The EITC's structure can be expected to encourage labor force participation among single parents, but to discourage it for many would-be secondary earners in married couples. Among workers, some face

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matched to 143,099 CPS records, covering about 95% of taxpayers (weighted). CPS records with imputed earnings (22%) or no linkage possible (7%) are excluded.

incentives to work more, while many more face incentives to work less. We consider each of these incentives in turn.[7]

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. For an individual whose potential earnings are below the end of the phase-in range, the effective negative tax rate equals the full EITC phase-in rate (net of rates imposed by other taxes or transfers), so the impact on the return to work is large.

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 the EITC thus reduces net returns to work. Importantly, the effective positive tax rate here is smaller in magnitude than the negative rate faced by single parents: It can never be bigger than the EITC phase-out rate (again, adjusted to account for other taxes and transfers), and will often be much smaller.

At the intensive margin – the choice of the number of hours to work per week or the number of weeks to work per year – incentives depend on where in the schedule the family falls. Workers in families on the phase-in range face incentives to work more, 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. One might also expect negative, albeit smaller, effects in the plateau region, where there is no substitution effect but income effects will generally lead to less work.

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 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. This requires a perhaps unrealistic level of knowledge of the tax code and ability to time one's employment. Slightly more realistically, 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 or progressive tax schedule – reduces the return to human capital. The reason is simple: An initial human

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

capital investment decision depends on anticipated future income if one does or does not make the investment. The EITC is likely to have more value if the investment is not made, as earnings in that case will be lower and thus future EITC payments will be larger. The existence of the program thus reduces the net return to education, and could in theory reduce investment. Similar considerations suggest a dynamic channel, beyond the static incentive created by the marginal tax rate, by which the EITC could reduce labor supply among younger workers: If an important part of the return to work is via the accumulation of experience that will lead to higher wages later in life, and if the EITC reduces the net return to higher future pre-tax wages, then it may reduce the incentive to work in early career "training" jobs. This effect depends importantly on the specific model of human capital investment, however – predictions can be reversed if the relevant investment is made in classrooms rather than on the job. It is worth emphasizing that these are theoretical predictions; empirical evidence is quite limited (though see Heckman, Lochner, and Cossa 2003).

The self-employed face additional incentives. 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 or reclassify some earnings in order to maximize their credit. Moreover, those in the phase-in range face incentives to *raise* 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. Similar incentives apply to those choosing between formal and informal (i.e., under the table) work – the EITC raises the return to being paid formally, though it can also incentivize shifting a portion of compensation under the table for those in the phase-out range (Gunter 2013).

There is no third-party reporting of self-employment income (nor, obviously, of informal sector earnings), making it harder to enforce accurate reporting here. Moreover, what enforcement mechanisms there are are aimed at detecting underreporting of income, not overreporting, so it is very difficult to detect workers who over-report their self employment income.

4.2. Why structure a program this way?

As the above discussion of the EITC's history makes clear, the program's various goals have long been in tension. 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.

As we discussed in Section 2.2, the EITC creates negative average and marginal tax rates on work in its phase-in range that are too large in magnitude, for most recipients, to be fully offset by the positive rates imposed by payroll taxes and the phase-out of other means-tested transfers. A natural explanation for this is 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).

One such externality is on government budgets. There may be a social interest in more work than would be chosen in the absence of any tax and transfer distortions, if this leads to more government revenue that can be used elsewhere. This consideration leads to "optimal tax" analyses that attempt to balance the benefits of tax revenue with the costs of distorting individual choice. 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.[8]

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.

A second potential externality is on children. Low family incomes may have negative effects on children, who bear no responsibility for their parents' economic circumstances, and this can create an argument for public intervention. But the most direct intervention to address this would be cash welfare, not the EITC.[9] A more compelling argument for the EITC's negative phase-in tax rate 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 it" and in expanding the EITC. Recent state-level innovations in non-custodial benefits (discussed in Section 6) are also consistent with this view.

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

[9] Many higher-income mothers appear to believe that a stay-at-home parent is better for young children than is paid childcare. 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 childcare is beneficial for low-income children (see, e.g., Deming 2009; Puma et al., 2012).

Another potential source of a child-related externality concerns the quality of childcare provided by stay-at-home mothers, relative to that which would be obtained if the mother worked. There is emerging evidence that center-based child care can be superior – in the sense of producing better child outcomes – to the at-home care provided in many low-income families (Heckman, Pinto and Savelyev 2013; Kline and Walters 2014; Feller et al. 2014). If so, subsidizing work via the EITC can perhaps be justified as a means of improving the quality of children's environments. (Though note that in practice, the alternative to at-home care is often not a well-run center but an informal arrangement with a neighbor or grandmother.) An attractive feature of this argument is that it can rationalize the fact that the EITC's generosity rises with the number of children and perhaps even the work disincentives that the EITC creates for married mothers: If married women, in contrast to single mothers, provide better at-home care than can be obtained on the market, encouraging them to remain out of the labor force can be optimal. But the EITC is an awfully indirect way of addressing childcare externalities, even granting the strong assumptions implicit in the above discussion. It would be more straightforward to subsidize (or provide directly) high-quality center-based care for the children of mothers deemed likely to provide poor care at home (see the Heckman et al. chapter in this volume).

A largely distinct set of questions about the EITC relates 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 producing 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: Refundable tax credits are not always perceived as spending, and don't count toward Congressional spending 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 above and in Section 5.4, 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. This could be avoided with individual credit schedules. But this is not practical, given the family basis of the rest of the U.S. income tax code. A more practical, though imperfect, alternative is to use a different schedule for married couples than for single parents, as was implemented in 2002. This can be expensive, however, as it means giving the credit to many families that elect to keep one spouse at home and are less needy than their per-adult market earnings imply.

4.3. Incidence

Labor supply impacts are only the beginning of the EITC's potential 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, including 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 markets as the 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 net-of-tax wage. We focus on a simple model with a single, linear tax, levied on the worker, that introduces a fixed wedge between the pre-tax wage w and the post-tax wage ω: ω=w(1-τ). 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 potential 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:

$$L^S = \alpha\, \omega^{\sigma}, \qquad (1)$$

where σ≥0 represents the elasticity of labor supply. Labor demand depends on the pre-tax wage that is actually paid by the employer, with elasticity ρ<0:

$$L^D = \beta\, w^{\rho}. \qquad (2)$$

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

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

and

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

This implies a post-tax wage of

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

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 is proportional to 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 has the potential to distort decisions on other margins. As mentioned above, it can reduce the effective returns to education. (It may improve children's educational outcomes, however, through direct effects of family resources.) 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.

In general, empirical evidence of perverse effects on potential recipients' marriage, fertility, and educational attainment decisions is thin (though there is stronger evidence of positive effects on children's outcomes.) We discuss this evidence in Section 5.3.

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. 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. We return to this topic in Section 5.2.

4.6. Interactions with other programs and the macroeconomy

We discussed interactions between eligibility for the EITC and for other means-tested transfers in Section 2.2. 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.[10] 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.

[10] Lee and Saez's (2012) result that the optimal policy combines the EITC and minimum wage depends on their assumption that rationing is efficient: That limited jobs go to those job seekers who receive the largest surplus from employment at the minimum wage.

5. Research on the EITC

In this section, we review empirical evidence about the use and effects of the EITC. Nearly all of the potential impacts discussed in Section 4 have been the subject of at least some serious research, though in some cases the evidence is not as conclusive as one would like and in others there is reasonably conclusive evidence that the predicted impact is small. We begin with evidence on participation rates and noncompliance. We then turn to what we view as the central question: How does the EITC impact participants' well-being? After reviewing various dimensions of well-being, we examine the effect of the EITC on the labor market, including the most-studied topic concerning the EITC: its impact on recipients' labor supply. Finally, we consider evidence on interactions. In our view, the most interesting question here concerns the EITC's potential role in offsetting cyclical fluctuations in employment and earnings, so we focus on this.

5.1. Methodology

The studies discussed in this section use a variety of methodological approaches to identify the effects of the EITC. One strategy is common enough, and raises enough issues that cut across categories of outcomes, to be worth a special note. This is the difference-in-differences research design. We discuss it briefly here, taking as our example the estimation of the effect of the EITC on participants' health.

A major challenge for any program evaluation is to distinguish the impacts of the program under study from those of other factors that may be coincident with program participation but causally independent. For example, a comparison of EITC recipients with individuals who are ineligible for the EITC due to too-high earnings may confound the EITC with that of other factors that lead to earnings differences between the groups.

Many researchers attempt to avoid this problem – known as "omitted variable bias" – via a method known as "difference-in-differences," or DD. This method attempts to remove the confounding influence of omitted factors affecting income by subtracting an estimate of the omitted variable bias obtained from a comparison between two groups that are *not* differentially treated by the EITC but are otherwise similarly situated to the EITC "treatment" and "control" groups.

For example, one common empirical strategy is based on the comparison between single mothers with two or more children and those with just a single child in the post-1996 period, when the former group was eligible for a much more generous EITC than was the latter. As single parents with multiple children may differ in many ways from those with only children, the simple comparison does not provide a credible estimate of the effect of the more generous credit schedule. A DD estimator acknowledges this, and uses differences among the two groups prior to 1993 – when they faced similar schedules – to separate the influence of the program from that of the unmeasured factors that might influence the two groups' relative outcomes.

Specifically, let $Y_{2+,1996}$ represent the average outcome for women with two or more children in 1996; $Y_{1,1996}$ represent the average outcome for women with single children in the same year; and $Y_{2+,1993}$ and $Y_{1,1993}$ represent the corresponding average outcomes in 1993. There are two simple differences estimators available. The first contrasts multiple-child families with single-child families in 1996:

$$D_{famsize} = Y_{2+,1996} - Y_{1,1996}. \quad (6)$$

The second contrasts multiple-child families in 1996 and 1993:

$$D_{timing} = Y_{2+,1996} - Y_{2+,1993}. \quad (7)$$

Neither of these provides credible evidence on the effects of the EITC. The first may be confounded by differences among families of different sizes, while the second may be confounded by changing economic conditions between 1993 and 1996. But the two strategies can be combined to form a difference-in-differences estimator:

$$\begin{aligned} DD &= (Y_{2+,1996} - Y_{1,1996}) - (Y_{2+,1993} - Y_{1,1993}) \\ &= (Y_{2+,1996} - Y_{2+,1993}) - (Y_{1,1996} - Y_{1,1993}). \end{aligned} \quad (8)$$

This will identify the impact of the EITC expansion on the relative outcomes of multiple-child families if any underlying trends in outcomes are similar for families of different sizes (or, equivalently, if any underlying differences between family size groups are stable over time).

Much of the available evidence about the impacts of the EITC comes from research designs of this type, exploiting either the relative expansion of the EITC for large families in 1996 or the introduction of state EITCs in some but not all states. If the requisite common-trends assumption holds, studies using this type of design can identify the effect of EITC expansion on the outcome of interest (e.g., health). [11]

But there are two challenges. One is that the common-trends assumption may be incorrect. The strong labor market of the late 1990s may have differentially affected less-skilled women, and single mothers with multiple children may have lower skill levels, on average, than do single mothers without children. Or the child care provisions of welfare reform may have had different implications for women with only children than for those with multiple children, for whom child care costs presumably loom larger. Another violation would occur if state EITCs were introduced in response to changing conditions or expectations.

A second challenge lies in interpreting the source of any EITC effect, once it is isolated. It is tempting to assume that an EITC effect on, e.g., maternal health reflects the impact of additional income and the goods and services (e.g., health care) that it can purchase. But this may be incorrect. EITC expansion has effects on other outcomes as well, most notably labor supply. Thus, the basic DD estimate for maternal health combines the pure effect of income on health, holding all else constant, with the effect of additional work. The EITC effect should be interpreted to include effects operating through (for example) changes in time use, access to employer-provided health insurance, and the mental health consequences of employment. This issue arises as well in many of the studies of other outcomes discussed below, whether based on the DD research design or on another strategy.

Unfortunately, there is no good solution. One can control for labor force participation in analyzing health impacts, but the resulting estimates are difficult to interpret. This is known as the "intermediate outcome problem." Absent an independent source of variation in each potential mediating channel, parsing the mechanisms that

[11] There are other formal requirements. In particular, one must assume that policy changes in one state or group do not affect other jurisdictions or workers. This is a version of the Stable Unit Treatment Value Assumption (Rubin 1986).

produce the reduced-form causal effects identified via a simple DD analysis is in general not possible.

5.2. Participation & compliance

5.2.1. Participation and takeup

Relative to many other transfer programs, takeup of the EITC among eligible families is quite high, in large part due to its administration through the tax code. Scholz (1994) estimates the take-up rate for the EITC in 1990 at 80 to 86%. By contrast, the 2004 take-up rate for Temporary Assistance for Needy Families (TANF) was 42%, the rate for the Food Stamp Program (now SNAP) was 55%, and take-up of the Supplemental Security Income program was 46% (HHS 2007).

EITC take-up rates have changed over time, due in part to increasing knowledge of the program and changing program rules. Scholz's (1994) estimate of take-up in 1990 likely overstates 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 semi-automatically issued the credit to filers who appeared eligible but did not claim the credit. Plueger (2009) estimates a 75 percent takeup rate for the EITC in 2005.

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. The 2009 figure matches the IRS's own estimate for 2010, from matched IRS-American Community Survey data (IRS, 2014c).

Jones 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 were 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, for who filing is often not required. 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) finds 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.

These differences in take-up rates across groups raise concerns about implications for horizontal equity. However, large changes in the composition of the eligible population over time can influence the overall take-up rate and take-up rates by subgroup, and the impact of these compositional shifts is not well understood. Reliable data that include both eligibility and receipt are very hard to come by, but some emerging research is beginning to disaggregate shifts over time in eligibility and receipt. Jones (2014a) finds 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) uses the 2006 CPS matched to tax data from 2005 through 2011 to examine changes in eligibility and finds 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 EITC take-up with participation in other programs. Caputo (2006) finds that food stamp receipt tripled the odds of filing for the EITC, but finds no significant correlations with SSI or TANF receipt. In contrast, Jones (2014a) finds 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).

5.2.2. 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 2,046 returns filed in 1994 that were subjected to additional scrutiny to estimate a 26 percent rate of overclaiming (though standard enforcement measures would be expected to reduce that rate to 20.7 percent). The rates of overclaiming may be overstated in the administrative data, however, as filers who request reconsideration of credit denials succeed in overturning nearly half of IRS rulings (National Taxpayer Advocate 2004). A more recent IRS study of audited 2006-2008 returns (Internal Revenue Service 2014h) found a pre-enforcement overclaiming rate between 28.5% and 39.1% of all EITC dollars claimed, depending on assumptions made about taxpayers who did not participate in the audit. This was not significantly different from what was found in an earlier 1999 study.

McCubbin (2000) finds that most of the overclaiming is due to filers claiming real but non-qualifying children. Despite subsequent changes intended to simplify the qualifying child rules, this remains the most common source of error in the more recent study. Residency test failures are the most common, suggesting that many non-custodial parents claim a child who should have been claimable only by the custodial parent. In the recent data, between 13 and 27% of all children claimed for the EITC were claimed in error (Internal Revenue Service 2014h).

Liebman (2000) examines the nature of compliance errors by matching the 1991 March Current Population Survey (CPS) to respondents' 1990 tax returns. This was prior to the introduction of the EITC schedule for families without children, and also predates IRS efforts to reduce over-claiming of dependent children. He finds that 11 to 13 percent of apparently EITC-eligible families who claimed children as dependents on their tax return did not report having children in the home on the CPS survey. A portion of this reflects timing – a child could have been present in the house for six months, as required to qualify for the EITC, without being there at the time of the March CPS survey. But there appear to be discrepancies that cannot be explained this way.

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." The IRS has recently modified the dependent child definitions, but as noted above qualifying child errors remain common.

McCubbin (2000) reports that incorrect filing status accounted for 31 percent of EITC overclaiming in 1994. 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. In more recent data, returns with filing status errors account for only about one-sixth of overclaims (Internal Revenue Service 2014h). A more common error in the 2006-8 returns is income misreporting, which occurred on two-thirds of returns with identifiable errors and accounted for only one-qaurter to one-third of overclaimed dollars. The bulk of this misreporting relates to self employment income, which cannot be checked against information reports as can traditional wage income.

5.2.3. Information

Surveys of low income tax filers at free tax preparation sites by Bhargava and Manoli (2015) indicate that many eligible filers are unaware of the credit and its incentives (see also 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. (Note, however, that a taxpayer need not be aware of the credit to receive it, particularly when a third party assists with tax preparation.) A majority (61 percent) of eligible, aware filers underestimate the size of the credit, by an average of 83 percent. They also substantially overestimate the likelihood of an audit: The actual audit rate is 1.8 percent, but the median respondent believed the rate to be 15 percent.

An important implication of this is that behavioral responses to the credit may be substantially muted relative to what would obtain if all taxpayers were aware of the

incentives they actually face. 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 in response to tax incentives, but rather try to maximize their refunds 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 (2015) examine whether informational barriers help explain 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. 14 percent of non-claimants claimed the credit after receiving a mailing with a "textually dense, two-sided document that emphasizes eligibility requirements repeated later in the worksheet," meant to mimic traditional IRS communications. A simplified design increased takeup by an additional 9 percentage points, while a mailing that clearly displayed the benefits of claiming increased takeup to 28 percentage points (5 percentage points more than the simplified form alone).

5.2.4. The Advance EITC

Until 2011, EITC recipients could choose to receive a portion of their credit with each paycheck rather than as a lump sum at tax filing time, via the Advance EIC program. Note that a taxpayer with positive non-EITC tax liability can do this to some extent by reducing withholding. But since most EITC recipients have negative net income tax liability, this still leaves most of the value of the credit to be paid as a refund the following spring. The Advance EIC allowed for *negative* withholding from the weekly, bi-weekly, or monthly paycheck. But take-up of this 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 (Holt 2008). 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 Advance EIC information and enrollment forms in the workplace. 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 workers claim the credit directly from the IRS, but signing up for the Advance EIC required submitting a withholding election form to 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.

The remaining candidate explanation is 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 amass 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. Much of the survey evidence discussed above can be interpreted to support this view.

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 retirement plan participation, but did not appreciably increase take-up of the Advance EIC. This seems to rule out motivations related to a desire to commit to long-term savings. However, 401(k) balances are highly illiquid; Jones' (2010) experiment would not identify a motivation to commit to medium-term savings (e.g., toward the purchase of durable goods).

The United Kingdom's working tax credit (formerly the Working Families' Tax Credit, or WFTC) is a useful analogy. These payments are disbursed on a monthly or bi-weekly basis. Brewer, Saez, and Shephard (2010) note the absence of a market for financial vehicles that would allow recipients to commit to saving their credits, in contrast to the (formerly) robust market in refund anticipation loans in the U.S. This is further suggestive evidence against forced savings explanations for the unpopularity of the Advance EIC.

Brewer et al. (2010) point instead to uncertainty as an important factor. A worker who expects to have several jobs over the course of the year, or whose hours vary unpredictably, may not be able to accurately forecast her eventual credit eligibility. Signing up for the Advance EIC could expose her to end-of-year liabilities if she turns out to have over-estimated. This could be costly for a family with limited or no access to credit markets and/or ability to commit to precautionary saving. (Note that Jones' (2010) 401(k) treatment would not address this concern, as it would be difficult to access 401(k) balances to pay end-of-year tax liabilities.) In 2005, the U.K. changed its credit system to base eligibility primarily on the prior year's income, accepting some reduction in targeting efficiency for the sake of reducing over-payments that would need to be squared up later.

Once again, however, concerns about eventual liabilities cannot fully explain the lack of take-up of the Advance EIC. Reforms introduced in 1993 limited the amount of the EITC that could be received in advance, making large overpayments unlikely, but had little effect on take-up.

Jones (2012) points out that the low take-up of the Advance EIC is only a part of a larger over-withholding puzzle. He documents that average tax refunds to EITC recipients *exceed* the average size of the credit, as many recipients elect positive withholding from their paychecks that is then refunded, along with the EITC, at the end of the year. This is potentially consistent with forced withholding or uncertainty explanations, but not at all with explanations related to information about or the mechanics of the Advance EIC. He interprets the patterns to indicate that inertia is a large component of the explanation – that taxpayers, particularly low-income taxpayers, take many years to adjust their withholding to account for changes in their tax liability.

5.3. Impacts on well-being

5.3.1. Poverty and consumption

The expansion of the EITC in the mid 1990s was associated with a large decline in child poverty rates, almost completely reversed in the Great Recession. The decline had a number of causes, welfare reform and the strong economy of that period among them. Nichols (2006, 2013) attributes nearly all of the changes in child poverty rates since the 1990s to changing work patterns of parents, where changing family structure was the dominant driver in the 1970s and 1980s. Several studies have found that the EITC was an important contributor due to its work incentives (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.

These studies capture only EITC effects that operate through changes in labor supply and pre-tax earnings, as these are the basis for the official poverty measure. The first-order consequence of the EITC – that the credit itself alleviates families' hardship – is not counted in official poverty calculations. The Census Bureau has developed a new Supplemental Poverty Measure (SPM) that includes taxes and cash and non-cash benefits in family resources. The Census Bureau estimates that the SPM poverty rate was 15.5 percent in 2013, but would have been 18.4 percent without the EITC and CTC (Short, 2014; see also CEA 2014). The effect on child poverty is even stronger: The SPM poverty rate for those under 18 years of age was 16.4 percent, but would have been 22.8 percent without the refundable tax credits. Based on these numbers, the EITC can be credited with lifting 9.1 million people, including 4.7 million children, out of poverty.[12] The effects on total poverty are far larger than those of any other single program except Social Security, and the effects on child poverty are the largest without exception.

Hoynes and Patel (2014) conduct a similar analysis, focusing on single mothers but expanding the scope to consider effects on other income thresholds. They find that EITC receipt is concentrated among families whose incomes (after other taxes and transfers) would be between 75% and 150% of the poverty line, and that the credit has large effects on the overall income distribution (for single mother families) in this range but small or zero effects below 75% or above 250% of poverty.

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 extra expenditures is vehicles. The authors interpret this as consistent with the program's pro-work goals, though there is no direct evidence that the extra vehicle 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,

[12] We are grateful to Hilary Hoynes for these calculations.

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 – the purchase of durable goods is a form of saving – or to paying off bills (Mendenhall et al. 2012). Gao, Kaushal, and Waldfogel (2009) find that each dollar in EITC generosity reduces single mothers' average debt by a statistically significant but small four cents.

Given their low incomes, EITC recipients are unlikely to be using their refunds to build substantial nest eggs. Athreya, Reilly, and Simpson (2010) find that EITC recipients have about one fifth the wealth of non-EITC recipients (who generally have higher incomes). The lowest quarter of EITC recipients have negative average wealth whereas the bottom quarter 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.

5.3.2. Health

Another way to assess the EITC's value for families is to examine objective measures of well-being. Health status is the most obvious, though clearly not all of the beneficial effects of the EITC will be captured through the relatively crude health measures that are available. 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%. The effects do not appear to operate through increased insurance coverage, but increased access to prenatal care may play a role, as may reductions in maternal smoking and drinking. Baughman and Duchovny (2013) also test for but 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.

As noted above, it is difficult to determine whether health effects reflect the additional income the EITC provides or the impact of increased labor force participation. Evans and Garthwaite (2014) find that estimated health effects are basically unchanged by the inclusion of controls 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.

5.3.3. Marriage and fertility

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 without marriage. The incentives can be very large as a percentage of total income for many low-income families. EITC expansions could thus be partly responsible for increased cohabitation rates in low-

income two-earner families. There may be both income and substitution effects at work here: Increased financial resources due to the EITC may free some women from the pressure to enter into unpromising marriages, even aside from any effect operating through the change in the size of the marriage penalty or bonus.

Dickert–Conlin and Houser (1998) 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 subsidized marriage on average for families earning less than $15,000, but created or added to marriage penalties, again on average, for higher-income families. The majority of EITC-induced marriage penalties are seen in couples whose combined incomes were above the EITC's eligibility threshold but would not have been had the couple not been married. As the EITC was expanded, incentives to marry increased for some due to larger marriage bonuses and decreased for others due to larger marriage penalties.

Unfortunately, the evidence to date can support only tentative conclusions about the presence and size of behavioral distortions in this area. One issue is the difficulty of disentangling direct effects from those operating through labor supply decisions, as income, fertility, and work are all jointly determined. On top of this, there were numerous changes during the 1990s in the tax and transfer system, with offsetting effects on marriage and fertility incentives. Given state dependence in the relevant outcomes – someone who has a child one year cannot un-have it the next year when the tax incentive has changed – it is much harder to tease apart the separate effects of the various factors than for annual choices like labor supply. 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. Nearly all estimates of responses to marriage and fertility incentives rely on not-very-accurate estimates of the magnitude of the incentive faced by a particular family. Thus, the empirical evidence is largely inconclusive, though it generally points to small effects.

Past work on incentives embedded in the tax and transfer system finds modest impacts on marriage (e.g., Alm and Whittington 1999, Moffitt 1994, and Hoynes 1997). 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 and many are statistically insignificant. 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. 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, though the sign is reversed when instrumenting for EITC using policy variation applied to baseline characteristics.

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. We do not observe the difference for single women, because we do not know the characteristics of her counterfactual spouse, or the behavioral responses that would accompany marriage. Thus, many analyses of marriage penalties and bonuses (e.g., Holtzblatt and Rebelein 2000) are based on samples of women who are actually married but could see higher (lower) after-tax incomes if divorced due to the elimination of the penalty (bonus). Their statuses may not be representative of those who are not married.

Michelmore (2014) addresses this issue by predicting the earnings of unobserved potential spouses for unmarried, non-college-educated women aged 18 to 50, 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 $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.

It is difficult to avoid the conclusion that effects of the EITC on marriage are poorly understood. Most confidence intervals include zero, but impacts could easily be one or two percentage points per thousand dollar change in the net marriage penalty/bonus. A possible explanation for the generally small estimated effects could be lack of knowledge about the presence and magnitude of marriage incentives (Tach and Halpern Meekin, 2014).

Evidence regarding effects on fertility is similarly inconclusive. Because the EITC is more generous for families with more children, nearly all recipients face incentives to have more children, and low-income individuals and couples without children face incentives to begin families. 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. Effects by marital status are potentially confounded by effects on marriage, and Baughman and Dickert-Conlin interpret their estimates as suggestive evidence that the larger EITC encouraged marriage among single women.

5.3.4. Children's educational outcomes

In addition to impacts on child health discussed above, a recent literature examines the impact of the EITC on children's educational achievement and attainment. There are strong associations of income in general with educational outcomes (e.g., Rothstein and Wozny 2013), implying that EITC-sized resource changes could have very large impacts on children in families receiving the credit. The social welfare implications of improved child outcomes are dramatic (Chetty et al. 2011; Heckman et al. 2010), and have the potential to swamp other more proximate impacts.

Dahl and Lochner (2012) use an instrumental variables strategy that leverages EITC expansions to identify the effect of additional family income in data from the Children of

the National Longitudinal Survey of Youth. They 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 EITC's test score impacts appear to be larger for boys, for younger children (under 12), for Black or Hispanic children, and for children whose parents are unmarried.

As above, the interpretation of these estimates is hazardous, as the EITC may have impacts on children that operate through channels other than family disposable resources. A particular concern for child outcomes is effects operating through changes in maternal labor supply. 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 average quality (in terms of productivity for educational outcomes) of the non-family care used when the mother works is lower than that of the in-home care that a more educated mother would otherwise provide but higher than that of the care that would be provided by less educated mothers. Since the EITC primarily affects less educated families, the labor supply effects may exert an independent positive effect, on average, on children's outcomes.

This may help to explain the magnitude of Dahl and Lochner's estimates. To put them in perspective, they are larger than the cross-sectional association between permanent family income and student test scores (Rothstein and Wozny 2013), which one might expect to be upward-biased due to omitted factors. They are also somewhat larger, though not dramatically so, than earlier estimates identified from the same population. One analysis of welfare experiments in the 1990s found 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 channels.

Another informative comparison is to the effects of educational interventions. For example, a well-known class size reduction experiment cost about $12,000 per pupil (in 2007 dollars) and increased student test scores by only 0.17 standard deviations (Dynarski, Hyman, and Schanzenbach 2013). Dahl and Lochner's estimates imply that simply giving the money to families – with no restriction that it be spent on children's education – increases test scores by over four times as much.

Dahl and Lochner attribute their large effects to the fact that IV estimates avoid downward bias from measurement error in family income (though so do the Rothstein and Wozny 2013 and Duncan et al. 2011 estimates); to the declining marginal effect of income, implying that EITC payments to low-income families will have larger than average effects; to an inferred propensity to use lump-sum credits for educationally productive investments; 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.

That said, there are 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). Moreover, because indirect EITC effects on family structure and labor supply may move in different directions for different families, the Dahl and Lochner estimates cannot be interpreted as local average treatment effects for any well-defined subpopulation.

Still, it seems likely that EITC expansions did improve children's test score outcomes, to a degree that is likely to translate into substantially better life outcomes. It is especially reassuring that other authors have recently found impacts that are generally in line with (or even larger than) Dahl and Lochner's estimates. For example, Chetty, Friedman, and Rockoff (2011) use the nonlinearity of the EITC schedule to identify the effect of EITC receipt on New York City schoolchildren's test scores, controlling for a smooth polynomial in AGI. (This can be seen as an informal version of a "regression kink" design, discussed below.) They find that $1,000 in EITC income raises test scores by 0.06-0.09 standard deviations. One would expect that Chetty et al.'s design would capture the effect of transitory variation in the EITC, where Dahl and Lochner's captures the effect of a permanent increase, so the Chetty et al. results imply substantially larger effects.

There is also evidence of effects on educational attainment – the amount of education obtained, as distinct from achievement on standardized tests during the process. Michelmore (2013) uses state EITC variation and data from the Survey of Income and Program Participation (SIPP) to find that a $1,000 increase in the maximum EITC 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.

Manoli and Turner (2014) use a regression kink design (RKD) to study the effect of EITC refunds in the senior year of high school on subsequent college enrollment. The RKD estimator exploits the fact that an extra dollar of earnings is associated with 34-40 cents in additional EITC for a family in the credit schedule's phase-in range, but with no change in EITC for a family in the plateau range. Thus, if the EITC affects enrollment then the relationship between income and enrollment should be stronger below the kink point that separates the two ranges than above it. Manoli and Turner find this to be the case; the magnitude of the effect implies that an extra $100 of EITC rebate in the senior year of high school increases college enrollment by 0.2 to 0.3 percentage points. (Because the RKD identifies the EITC's effect from very small variations, we report the effect per $100. But if one is willing to extrapolate from this design, the overall effect of the program on college enrollment is quite large.)

Taking all of the estimates together, there is robust evidence of quite large effects of the EITC on children's academic achievement and attainment, with potentially important consequences for later-life outcomes. Indeed, the effects are large enough to demand an explanation for the relatively small estimates of effects of family income on student outcomes that come from non-EITC settings. We do not see this issue as fully resolved.

There is one notable area of conflict among the EITC studies. Several of the studies (including Dahl and Lochner 2012, Michelmore 2013, and Maxfield 2013) find that effects

are concentrated among younger children, and that EITC payments received when children are older have small or zero effects. It is not clear how to reconcile this with the large estimates of Manoli and Turner (2014), which come from variation in the credit received by the families of college seniors, or with Chetty et al.'s (2011) finding that the EITC has larger effects on middle school than on elementary school students. The resolution has important implications for theories of child development.

5.4. Labor market impacts

An enormous literature in the 1990s examined the labor supply effects of the EITC, particularly on single mothers (e.g., Eissa and Liebman 1996; Meyer 2002; and Meyer and Rosenbaum 2001). Much of this work exploited the large expansion of the program, especially for families with two or more children, enacted in 1993, though some studies instead exploited variation in state-level credits.

There is remarkable consensus around a few key results. In particular, essentially all authors agree 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, and on male labor supply at either margin, were generally small. We review the key results from this early literature below, but refer readers to Hotz and Scholz (2003; see also see, e.g., Eissa and Hoynes 2006, 2011; Hoynes 2009; Meyer 2008, 2010) for a more comprehensive review. We attempt to be more complete in our review of the somewhat smaller post-2003 literature.

5.4.1. Labor supply – extensive margin

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 8A: For the decade and a half before 1993, the annual employment rate for unmarried women with children hovered around 70%, similar to that for married mothers. By 2001, the single mother employment rate rose to above 80%, similar to that for women without children. It remained elevated through the onset of the Great Recession, but has collapsed since. (This collapse appears to reflect increased rates of school enrollment and/or reduced rates of working while in school among single mothers; it is largely absent in an alternative series that excludes students.)

Many studies identify the EITC's effect based on contrasts between women with a single child and those with two or more children, exploiting the 1993 expansion's relative generosity for multi-child families. Figure 8B shows employment rates for single women, separately for families with zero, one, two, and three or more children. We see here that the mid-1990s increases are concentrated in larger families, consistent with them being attributable to the EITC. The most recent data also shows a suggestive increase in the employment of women with three or more children, consistent with an effect of the 2009 expansion of the credit for these women, though given the turbulence of recent macroeconomic conditions it is probably too early to draw firm conclusions.

Given the clear patterns in the 1990s, it is not surprising that studies based on the 1993 expansion indicate that the EITC raises single mothers' employment rates. Meyer and Rosenbaum (2001) find that this expansion raised single mothers' annual employment rates by 3.1 percentage points, over one-third of the total increase relative to single

childless women between 1992 and 1996. This implies an extensive-margin labor supply elasticity around 0.7. Other studies come to similar conclusions. Dahl, DeLeire, and Schwabish (2009) find that more generous EITC benefits are 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.

There are two important concerns about the studies of the mid-1990s expansion. First, as discussed above, studies that identify the effects of the EITC from comparisons between women with a single child and those with two or more children implicitly assume that other policy changes would not have had differential effects on families of different sizes, though this may not be true. There were a great many other things happening during the mid-1990s that might have contributed to the rise in employment, including in particular welfare reform and the strong economy of the late 1990s, and these may have had heterogeneous effects. In particular, the returns to work net of child care costs are likely to be quite different for women with multiple children than for those with a single child, and for those with young children not yet eligible for public school than for those with older children. This implies differential selection into non-participation under any fixed regime, and likely differences in the effects of welfare reform that could easily mirror the expected effects of the EITC by family size. Looney and Manoli (2013) argue that the increase in the 1990s in the relative labor force participation rates of multiple-child single mothers – the main evidence for EITC effects – reflects increases in participation of mothers with children under 5 rather than anything about the number of children itself.

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 ruled out 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), and studies that exploit state EITC expansions also find similar effects.[13]

The consensus interpretation is not without dissenters, however. Mead (2014) argues that the change in incentives induced by the 1993 EITC expansion was *not* responsible for moving single mothers into the labor force. He relies 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."

We find Mead's arguments unconvincing. Even if non-working potential recipients of the expanded EITC knew nothing about it, the EITC could still have had an effect by

[13] One exception is Cancian and Levinson (2006), who find no labor supply response to the 1995 introduction of a generous EITC supplement in Wisconsin for women with three children.

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 of labor force participants. 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.

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 average tax rates on 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. This effect is, of course, much smaller than the positive effect on single mothers, small enough not to be visible in Figure 8A. The larger number of married mothers, however, means that even a small effect can have important aggregate implications.

5.4.2. Labor supply – intensive margin

Most research on the EITC's labor supply effects in the last decade has focused on the intensive margin – the choices of the number of weeks to work per year and the number of hours to work per week among those who would work in any case.

Many of the early studies that documented large extensive margin effects for single mothers examined effects on average annual hours worked among workers as well. These generally found very small or zero effects. But standard difference-in-differences research designs are 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 are based on parametric specifications of the individual's utility function and on assumptions that that observed choices are utility maximizing. If the utility function is correctly specified, observed choices can be used to identify its parameters, and these in turn can be used to compute behavioral effects on intensive-margin labor supply net of composition changes. This is easier said than done, however. In particular, it is difficult to incorporate into structural models a realistic distinction between labor force participation and hours of work decisions that allows for meaningfully different responses on the two margins. 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, 2000; though Heim 2010 is an exception). More recent models also incorporate potential dynamic effects and incentives (Blundell, Costa Dias, Meghir, Shaw 2013), which are difficult to study using reduced-form methods.

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 the

results of reduced form studies 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 rather than because they are believed to be particularly plausible. 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 intensive margin responses will vary across the different segments of the EITC schedule: Those in the phase-in range will increase their labor supply, those in the phase-out range will reduce it, and those in the plateau will likely show smaller responses. This implies that the EITC should lead to "hollowing out" of the earnings distribution around the third kink, at the end of the phase-out range of the schedule, and to "bunching" around the first and second kinks.

This is illustrated for several hypothetical individuals in Figure 9. The curved lines illustrate indifference curves between leisure and consumption that would generate traditional labor supply responses. The person whose preferences are depicted in Panel A would have chosen labor supply above the maximum level for credit eligibility had the credit not existed, but responds to the program by reducing her labor supply into the phase-out range in order to receive a credit. This 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, Panel B shows 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, as a range of individuals shift from just above the kink to locate exactly at it.

Panel C shows a third individual who would have been in the plateau range before the expansion. For this person, 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. Finally, the individual depicted in panel D would have located in the phase-in range without the credit, and substitution effects lead her to increase her labor supply in response to the credit, creating a second point mass at the first schedule kink.

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 first and second kink points when the EITC is expanded, while others will reduce labor supply to move from the region beyond the end of the EITC

eligibility range 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 an estimate of the mass near these points in the counterfactual. (In principle, it would also be possible to construct an estimate from the "missing" mass around the non-convex kink at the end of the phase-out segment.)

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 unaware of their marginal tax rates or 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 generally negative in the phase-in range (see the discussion in Section 2.2). 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 to construct another measure of intensive-margin responses based on labor supply of new parents. Because families with children are eligible for a much more generous credit than those without, individuals who have just had a child – or who expect to have one later in the calendar year – face incentives to change their labor supply from what was optimal before parenthood. Thus, Chetty et al. measure the frequency with which the change in labor supply from the year before to the year of a first child's birth has the effect of increasing the family's EITC. An important advantage of this measure is its sensitivity to realistic labor supply responses. 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.

Using this measure, Chetty et al. (2013) estimate an average intensive margin earnings elasticity around 0.14 in the phase-out region and 0.31 in the phase-in region. They also find that the response is correlated across geographic areas with a Saez (2010)-style measure of the amount of bunching at the first kink point among the self-employed. They interpret the latter variation as deriving from differences in awareness of the EITC schedule and the incentives it creates, and thus the covariation between the two measures as an indication that intensive-margin responses are depressed by a lack of information. In zip codes in the top decile of bunching among the self-employed, they estimate intensive margin elasticities of 0.29 in the phase-out region and 0.84 in the phase-in.

The discrepancy with prior estimates that generally fail to find meaningful intensive margin responses likely has several potential explanations. One is the limitations of difference-in-differences estimates of intensive margin responses, discussed above, which may have masked true responses in earlier work. A second is that past work focuses primarily on the phase-out range – as discussed above, policymakers and researchers 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.

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.

These considerations lead us to conclude that the true intensive margin elasticity is probably positive but small on average. Even Chetty et al.'s (2013) estimate of an average intensive elasticity of 0.14 in the phase-out range, in a population that might be expected to be unusually responsive, is several multiples smaller than consensus estimates of the extensive-margin elasticity around 0.7 to 1.0. There may be a somewhat higher elasticity in the phase-in range, though it is also possible that this reflects reporting, along the lines of the reporting choices that lead to bunching among the self-employed. Chetty et al. (2013) assume that wage and salary workers do not have latitude over reporting, but this is not clear: They may be able to work under the table, or simply to fail to report (some of) their tip income. In any event, even if all of the phase-in response is real, it remains much smaller than the extensive elasticity.

Chetty et al. find much larger responses in zip codes where the self employed exhibit a high degree of bunching. Their interpretation is that intensive margin labor supply elasticities with respect to known incentives are reasonably large but that it is only in these zip codes that knowledge of the credit is widespread. Under this view, average elasticities are small only because people in more typical zip codes are generally unaware of their marginal tax rates. But there are other possible interpretations. Chetty et al.'s bunching measure could equally well be interpreted not as a measure of knowledge of the tax schedule but 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 is supported by the geographic distribution: Bunching is high in the southern United States, consistent with other evidence that social capital and rule-following are relatively low in this region. If this interpretation is correct, responses in high-knowledge areas may not actually reflect taxpayers' underlying preferences or even their true labor supply, and expanding this form of knowledge may not be welfare improving.

5.4.3. Incidence

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.

The empirical evidence reviewed above suggests that single mothers have increased their labor supply substantially in response to EITC expansions, with any negative intensive margin effects dominated by the extensive margin effects, and that any effects on married women were small by comparison. Standard tax incidence models (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 presents a challenge for studies of wage effects. Recall the standard research design for studying labor supply responses to the EITC, contrasting 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 markets, 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, with different EITC-induced labor supply shocks, which are 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. He 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 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 a reduction in the effective tax rate unambiguously raises net-of-tax wages, and equation (4) indicates that pre-tax 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 approach or methods. 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 pre-tax wages *rose* in the mid-1990s, where the incidence model predicts a decline, 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 the pattern 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.

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. Finally, Azmat (2008) examines wage effects of the United Kingdom Working Families' Tax Credit (WFTC). As discussed above, the WFTC is administered via workers' paychecks, so employers know which workers are and are not receiving the credit. Azmat finds that participating workers' pre-tax wages fell relative to those of non-participants in the same workplaces. Insofar as the two groups of workers are substitutes in production, the standard model implies that wage effects should be identical (and that the contrast cannot identify the incidence effect), so Azmat's evidence points to employer discrimination that is ruled out in neoclassical models but may be possible if employers are monopsonistic.

While each of these studies makes a valiant effort to identify wage effects of the EITC, we think – each of us having authored or co-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 large 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.[14] But the general conclusion that labor supply subsidies in 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. (This could be implemented as an EITC plus a separate welfare program for non-workers that phases out over the EITC phase-in range.) They also militate for combining the EITC with other policies aimed at limiting employer capture, such as the minimum wage (Lee and Saez 2012).

5.5. Interactions

5.5.1. 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, discussed in Section 5.4.

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.

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

5.5.2. Labor market interactions

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 refunds last longer, consistent with the presence of important liquidity effects on job search behavior (Chetty 2008; Card, Chetty, and Weber 2007).

Bitler, Hoynes, and Kuka (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. 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. Recently, these discussions have centered on the temporary EITC expansions (a larger credit for three-child families and a extended schedule for married couples) introduced in 2009, which are currently due to expire in 2017. President Obama's 2016 budget proposal would make these permanent.

Discussions of expanding the EITC often occur against the backdrop of a proposed increase in the minimum wage. Opponents of minimum wage increases frequently 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).

One area of recurrent concern is 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 it 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 more generally. This has attracted support of late from both President Obama and prominent Republicans (notably Representative Paul Ryan, now chair of the House Ways and Means Committee). President Obama's most recent proposal, part of his 2016 budget, would double the childless worker credit and extend the phase-out range, as well as extend the age ranges at which taxpayers are eligible.

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. A related, more incremental recent proposal from Kearney and Turner (2013) would allow secondary earners to deduct a portion of their earnings. This would also reduce the second worker penalty and effectively extend the EITC schedule to higher earnings levels for two-earner families.

Several authors have proposed rationalizing the definitions of children across tax and transfer rules (e.g., Maag 2011), which would reduce compliance costs. As noted above, recent changes in dependent rules move in this direction. But other recent policies have 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.

6.2. Administration of the EITC

An important source of policymakers' dissatisfaction with the EITC revolves around its arrival as a lump-sum payment, months after the period that it nominally covers. This is surely an important brake on the credit's ability to cushion families against income shocks, and it creates an opportunity for financial services firms to capture a portion of the credit via expensive financial instruments. 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.

Nevertheless, the ambition to change the method of payment remains, and several proposals or demonstrations have arisen in recent years. For example, the Periodic Earned Income Tax Credit Payment Pilot Project, begun 2014 by the Center for Economic Progress, Chicago Mayor Rahm Emanuel, the Chicago Housing Authority, and the University of Illinois at Urbana-Champaign, aims to explore whether a quarterly advance credit (structured as a loan but treated as an advance on the credit) can help balance families' needs for a savings vehicle with the need for extra resources during the year. The Center for American Progress (Vallas, Boteach, and West 2014) recently proposed allowing workers to access a small portion of their EITC early so they do not have to rely on predatory lending products, an idea adopted in 2015 by Senator Sherrod Brown from Ohio.

However, 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 for-profit tax preparers in the administration of the EITC. Recent bank regulation efforts have largely eliminated refund anticipation loans, though there are still other financial products designed to capture a portion of the tax refund. 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.

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 (2012) 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 become the centerpiece of the U.S. safety net, dwarfing other means-tested programs in terms of the number of beneficiaries, total expenditures, or poverty reduction impacts.

Research in the last two decades has documented large positive impacts on net incomes for low-income families who work and dramatic improvements in 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. Recent research has documented extremely important benefits for children's educational achievement and attainment. The generally positive impacts found for the EITC have led to broad political support and a raft of proposals to expand its reach.

The exact form of the credit evolves frequently. Recent changes reducing marriage penalties may have increased marriage rates among some low-income families, and experimental state-level credits aimed at noncustodial parents seem to have increased work and payment of child support.

The advantage of an earned income tax credit over a negative income tax or equivalent transfer policy (e.g., cash welfare with a less than 100% clawback rate) depends on the effectiveness of the EITC at moving people into work, and on the desirability of that outcome. 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, or to displace other potential workers. 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. We discuss here a few topics that, while not necessarily understudied, remain less than completely resolved. These would be our priorities for future research.

On the labor supply front, a better understanding of intensive margin responses would be quite valuable. How generalizable are Chetty et al.'s (2013) results to a population beyond first-time parents? Another important question in this area concerns the form of intensive margin responses: Do these come through changes in hours worked per week or through changes in weeks worked per year? The latter is in some sense an

extensive margin effect; given other evidence of strong extensive margin effects, it would be unsurprising if much of the apparent intensive margin responsiveness reflected effects on weeks worked (including those that occur via changes in job durations).

Another set of important topics for further research concerns the effects of the EITC on human capital accumulation. What are the mechanisms that underlie the large effects on children's academic achievement and attainment discussed in Section 5.3? Are there dynamic effects on recipients' own long-run productivity, perhaps operating through more stable labor force attachment or through crowd-out of formal education by increased employment? And does the availability of the EITC affect potential future recipients' educational investment decisions in the pre-labor-market stage of life?

A third set of topics concerns the nature of gaming, manipulation, and tax evasion that leads to bunching among the self-employed at the EITC kink point. What, exactly, is going on here? Are people working more to qualify for the maximum credit, reporting their actual income more completely, or fabricating income for the purpose of receiving the credit?

Among topics that have not been much studied to date, we think that one of the most important concerns the interaction of the EITC with the new health insurance marketplaces created under the Affordable Care Act, and in particular with the new means-tested subsidies for insurance purchase. This bears study as the new health insurance regime takes shape.

Finally, as the EITC has become an ever-larger share of the U.S. anti-poverty portfolio, more research is needed into the people who are *not* reached. How many people fail to qualify for the EITC due to extended spells of unemployment, to work-limiting disabilities, or to other barriers to employment? And how do they make ends meet?

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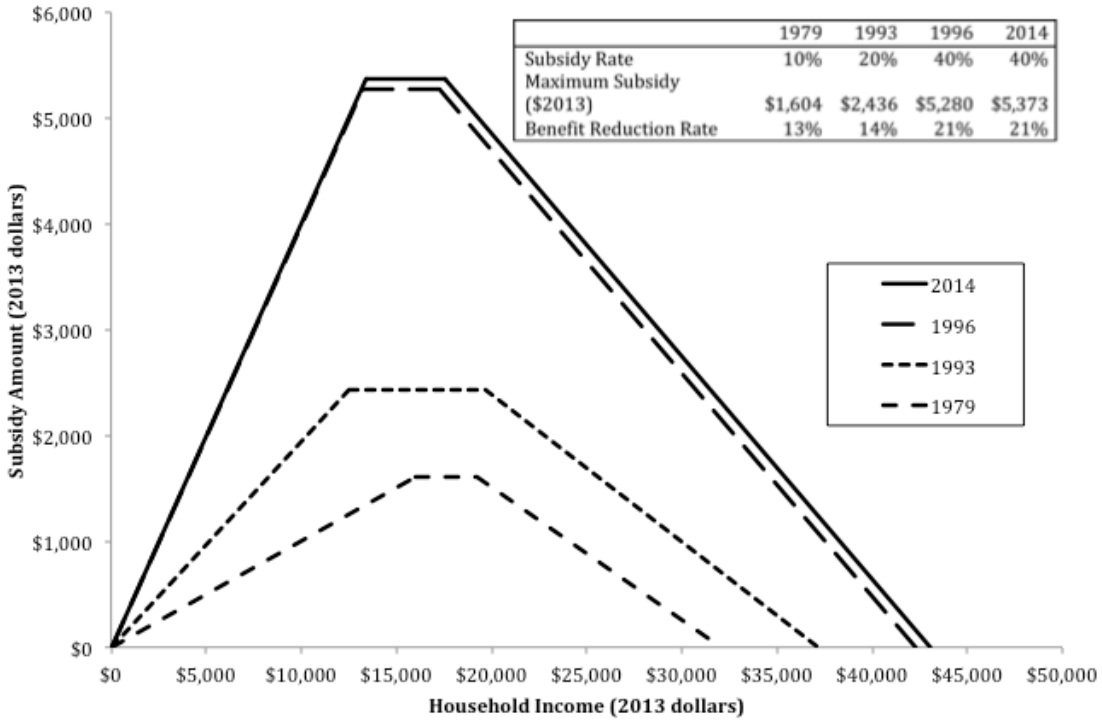
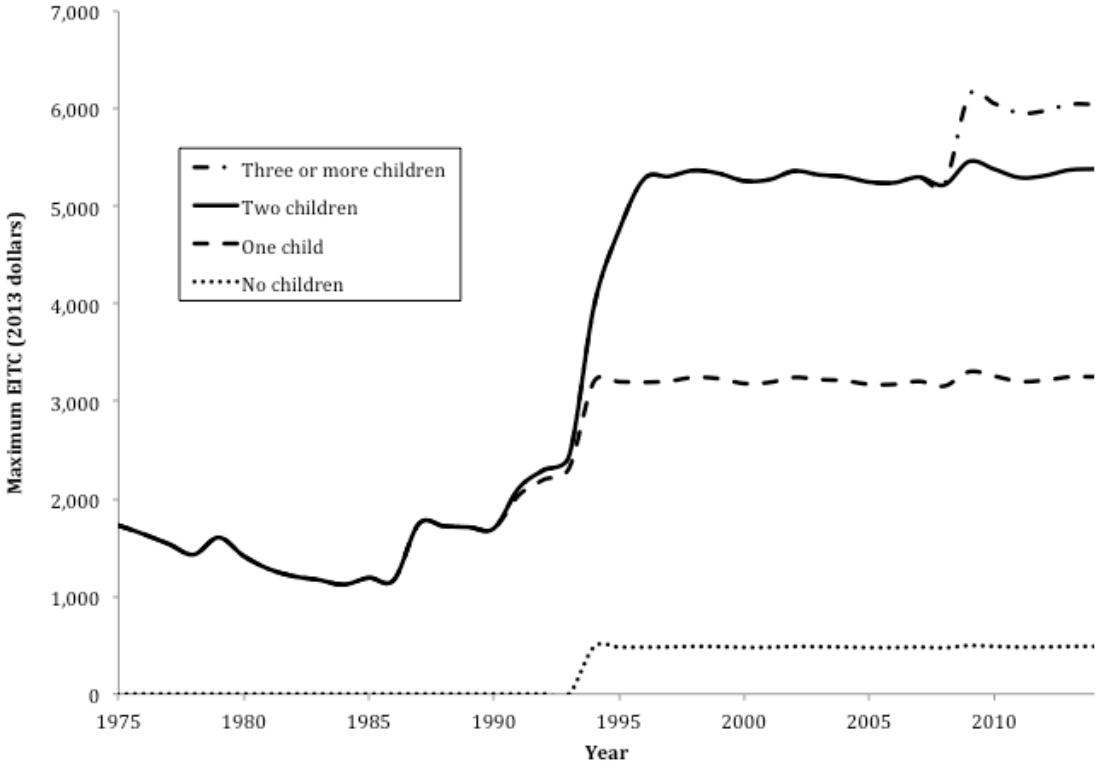
Figure 1. EITC Schedule for Single Parents with Two Qualifying Children, 1979, 1993, 1996 and 2014.



	1979	1993	1996	2014
Subsidy Rate	10%	20%	40%	40%
Maximum Subsidy ($2013)	$1,604	$2,436	$5,280	$5,373
Benefit Reduction Rate	13%	14%	21%	21%

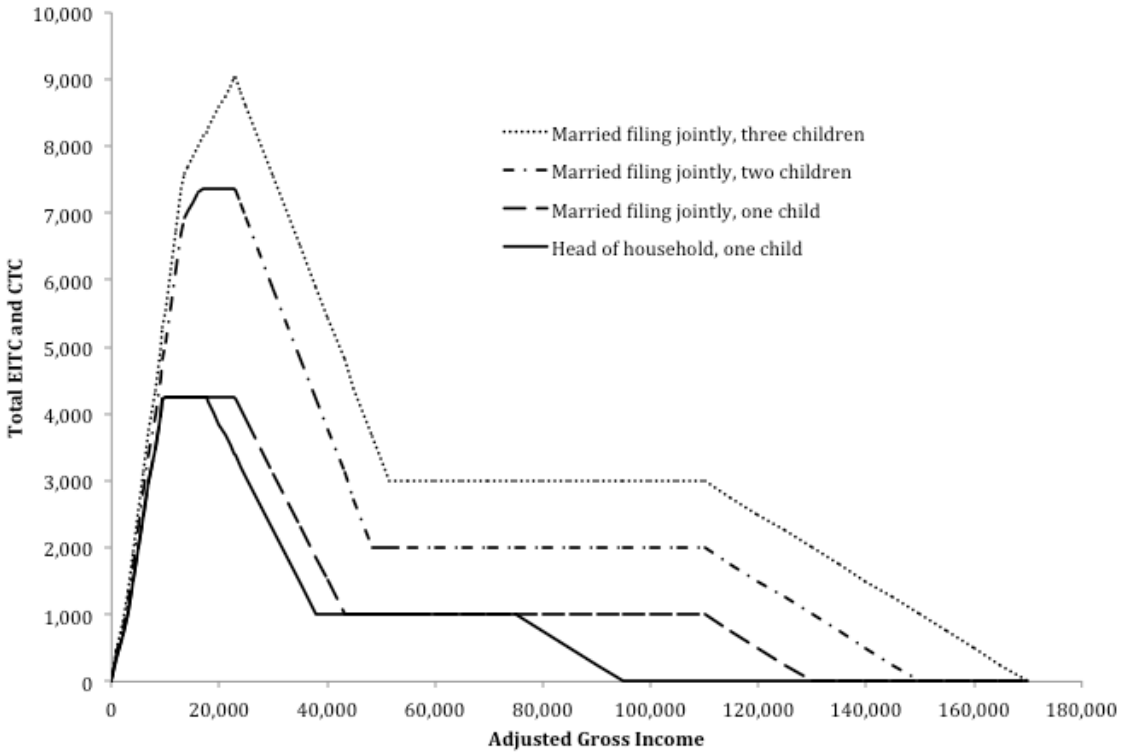
Sources: U.S. Government Publishing Office (2004); Internal Revenue Service and U.S. Department of the Treasury (2014).
Notes: Calculations assume no unearned income.

Figure 2. Maximum real credit over time, by number of children



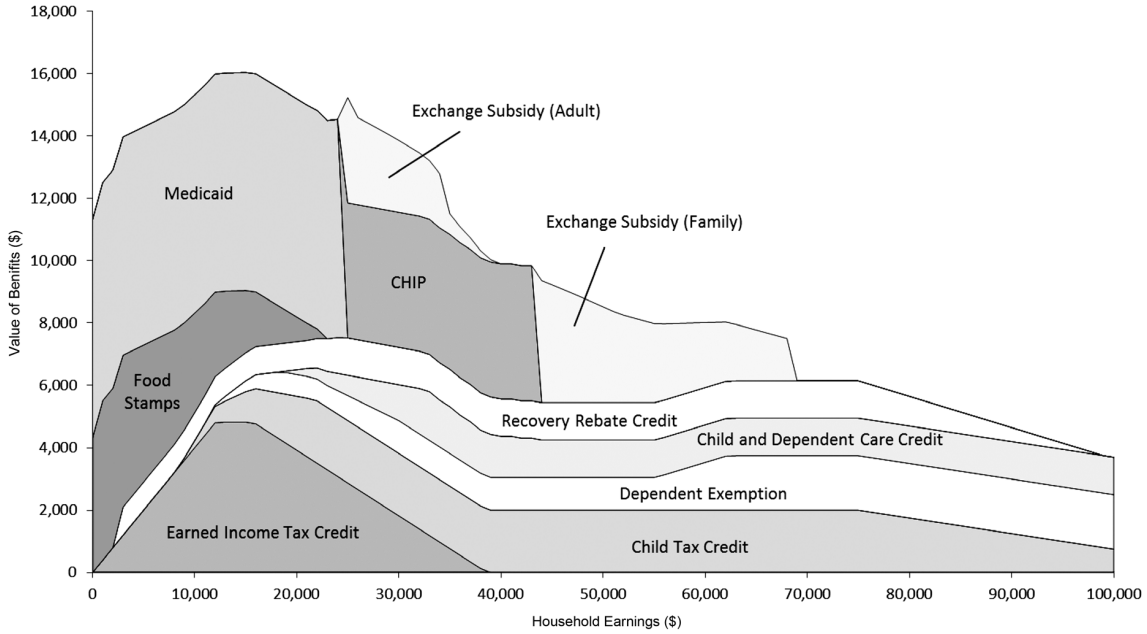
Sources: U.S. Government Publishing Office (2004); Internal Revenue Service Publication number 596 (various years).

Figure 3. Combined EITC & Child Tax Credit Schedules, 2013



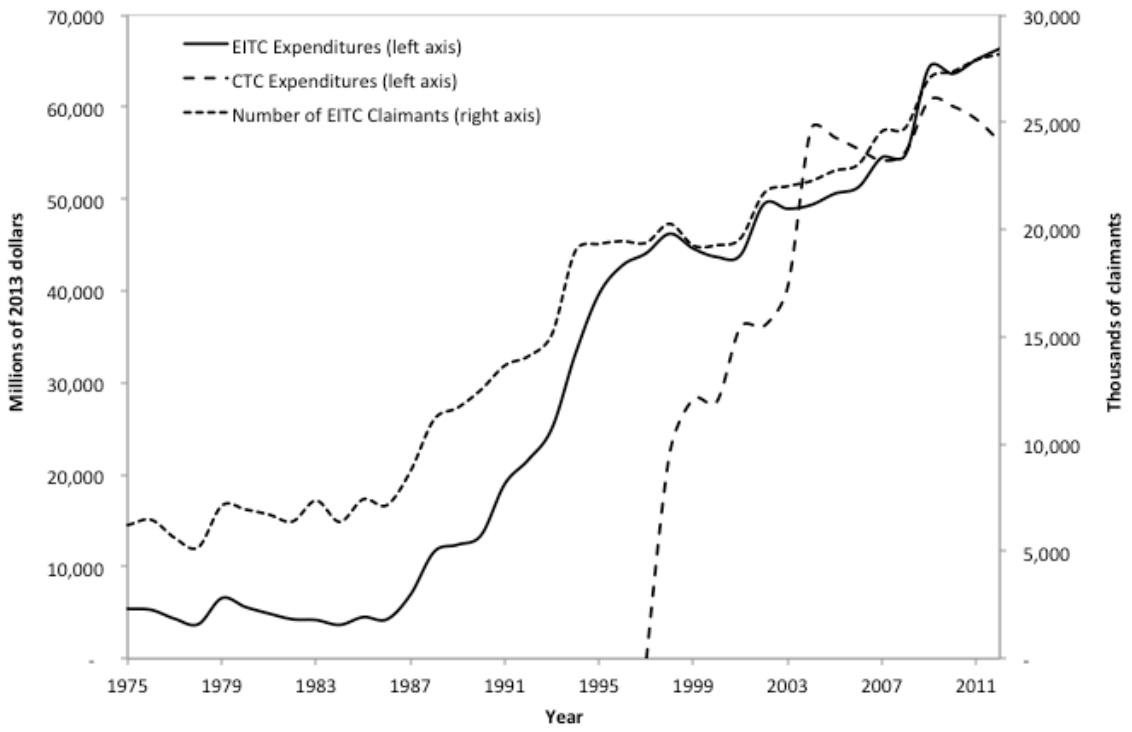
Sources: U.S. Government Publishing Office (2011); Internal Revenue Service (2013).
Notes: Figure includes only the refundable portion of the Child Tax Credit. Calculations assume that adjusted gross income equals earned income.

Figure 4. Universally available tax and transfer benefits: Single parent with two children in Colorado, 2008 (from Maag et al. 2012)



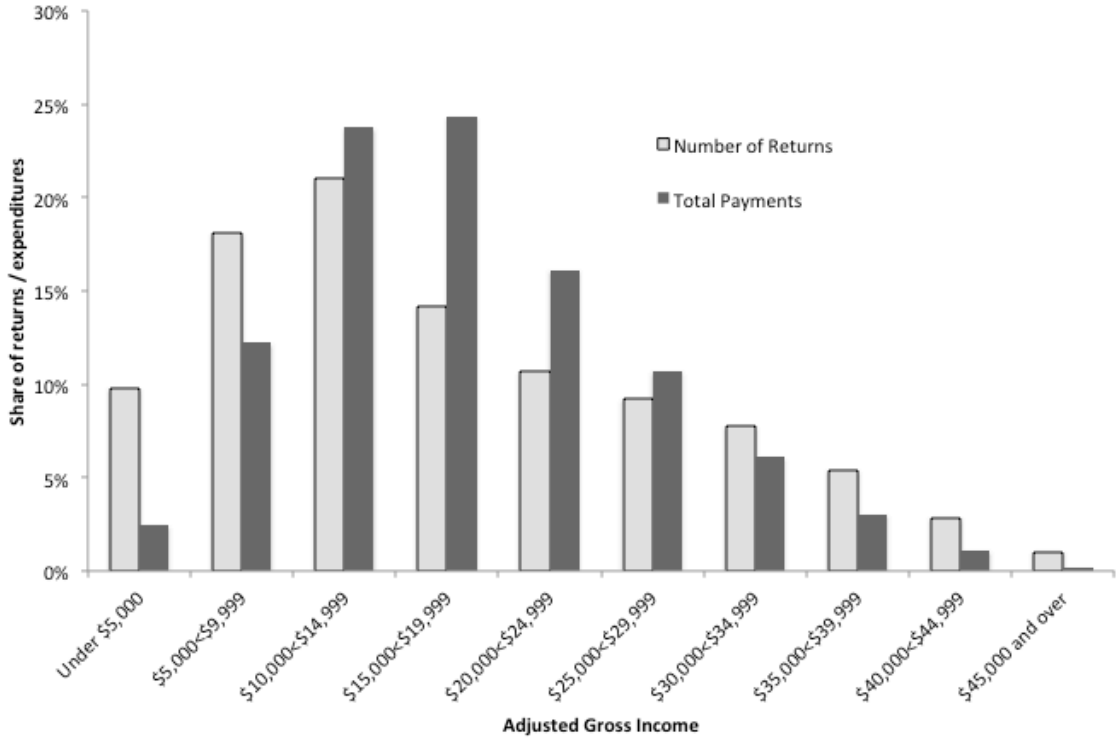
Source: Reproduced from Maag et al. (2012), Figure 1. Tax and transfer rules are for 2008 with hypothetical exchange plans in 2014 added in. Health value estimates are based on Medicaid spending and insurance premiums as reported by the Kaiser Family Foundation.

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



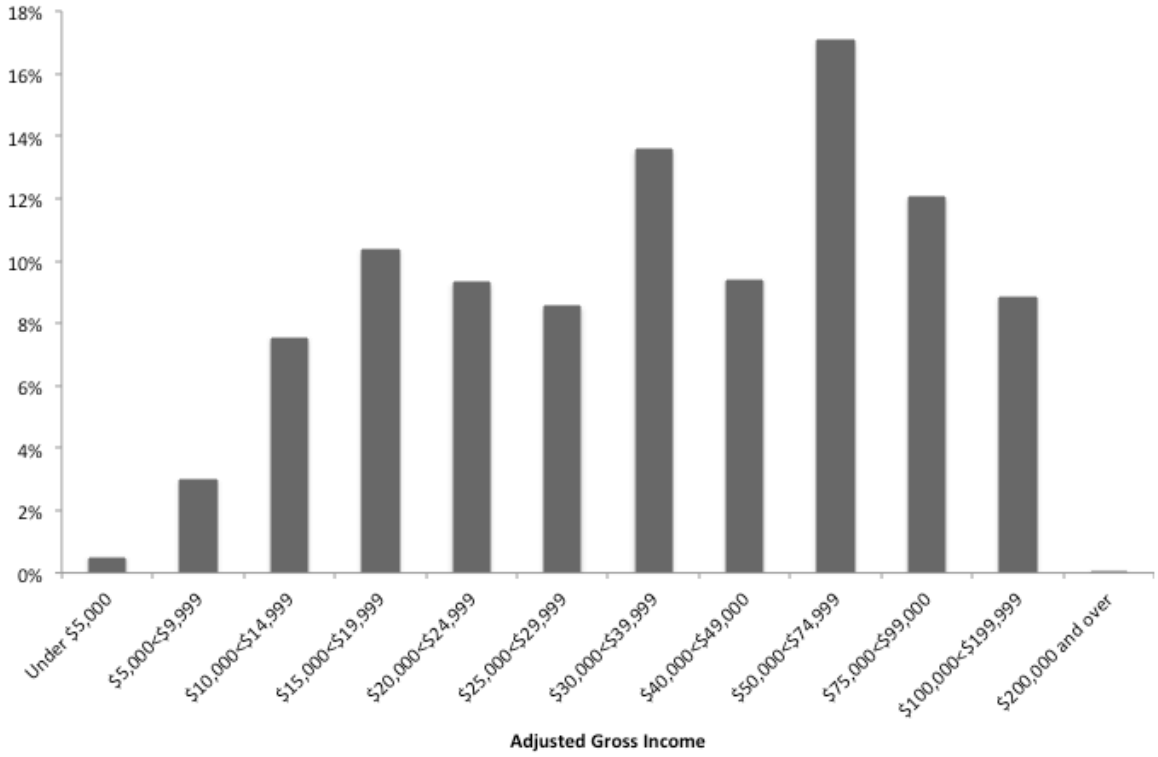
Sources: Internal Revenue Service (2014d, e); Tax Policy Center (2014, 2015).
Notes: Child Tax Credit expenditures include the Additional Child Tax Credit.

Figure 6. Income distribution of EITC recipients, unweighted and weighted by payment received, 2012



Source: Internal Revenue Service (2014f).

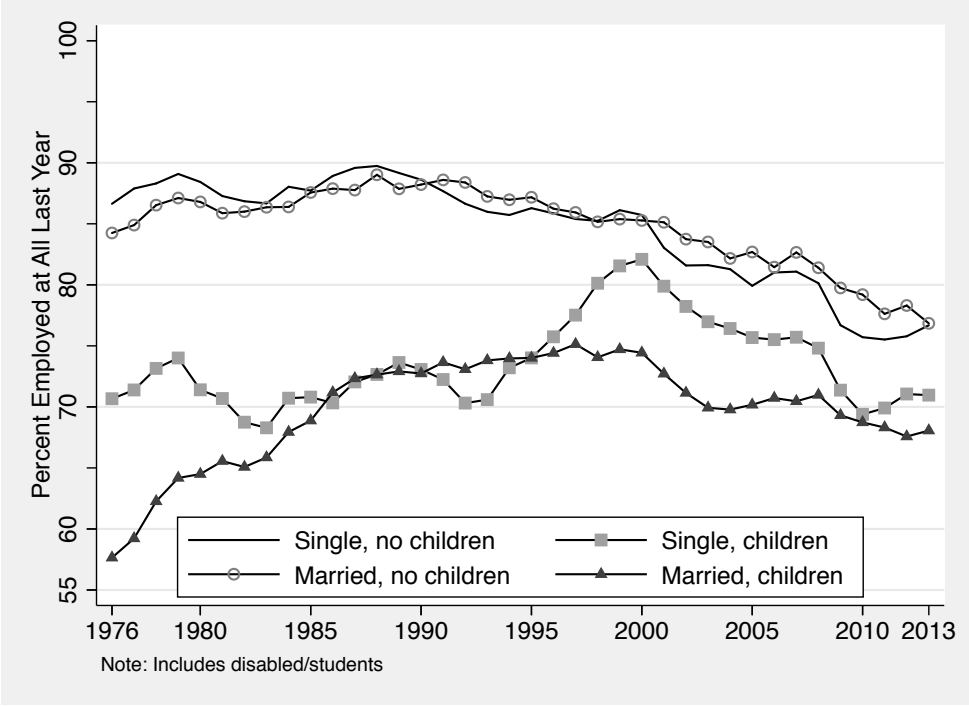
Figure 7. Income distribution of CTC recipients, weighted by payment received, 2012



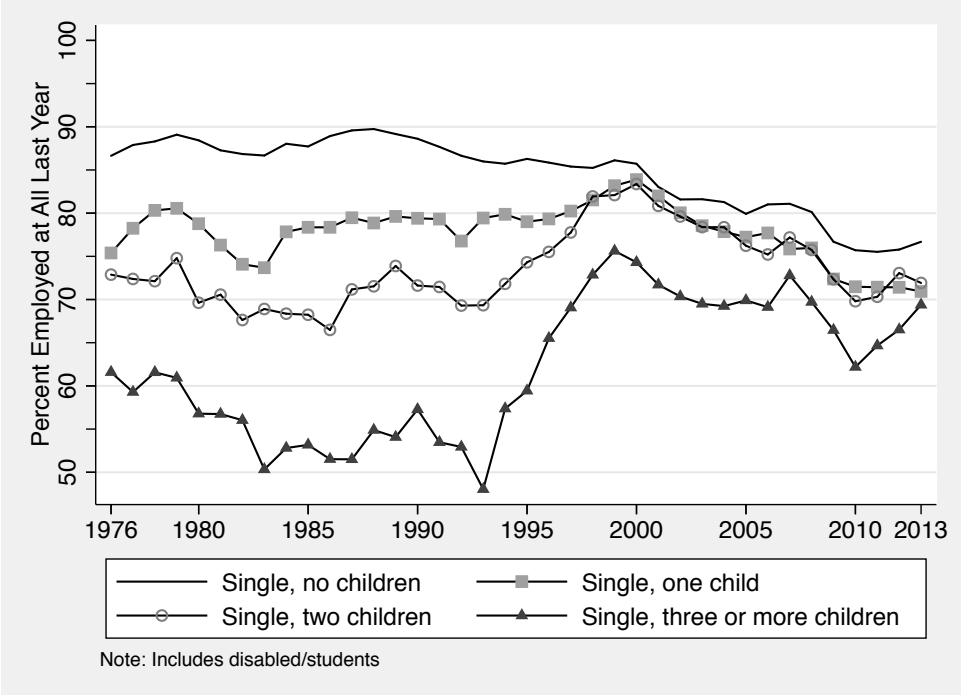
Source: Internal Revenue Service (2014g).
Note: Figure reflects the CTC-weighted income distribution, corresponding to the "total payments" series in Figure 6.

Figure 8. Female employment rates over time

Panel A: By marital status and presence of children



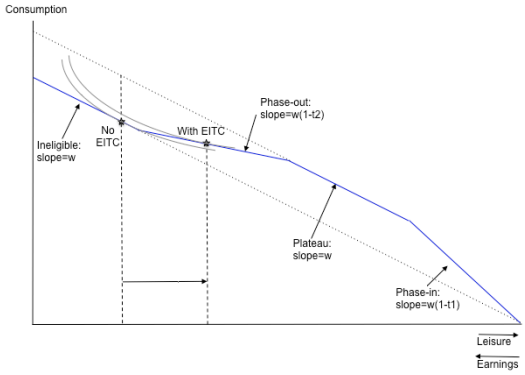
Panel B: Unmarried women, by number of children



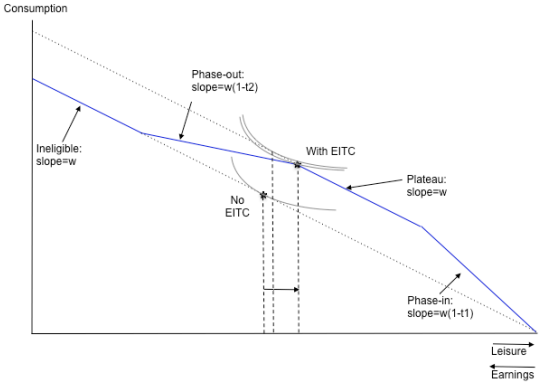
Source: Authors' analysis of the Current Population Survey Annual Social and Economic Supplement (CPS ASEC, also known as the March CPS).

Figure 9. Labor supply responses to the EITC

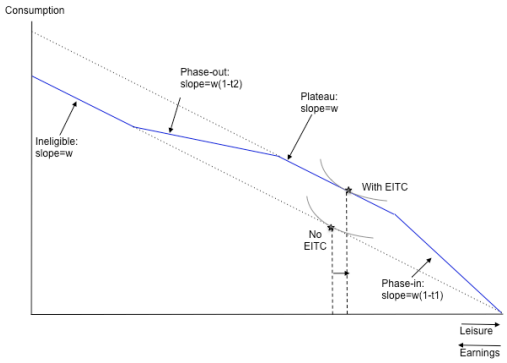
Panel A



Panel B



Panel C



Panel D

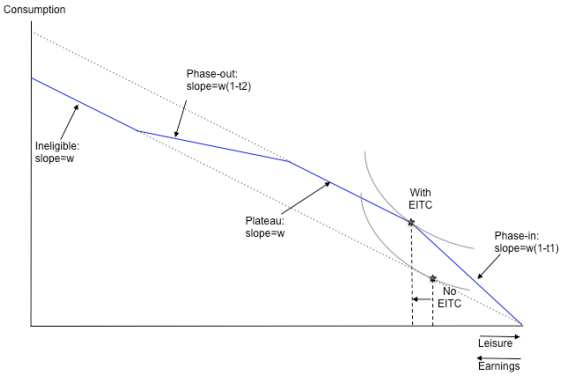


Table 1. EITC schedule, 1975-2014 (selected years), in 2013 dollars

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
1989	14.00	6,500	910	10	10,240	19,340
1988	14.00	6,240	874	10	9,840	18,576
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 values of the beginning and ending points of the phase-out range were increased for married taxpayers filing jointly. The values for these taxpayers were $1,000 higher than the listed values values from 2002-2004, $2,000 higher from 2005-2007, $3,000 higher in 2008, $5,000 higher in 2009, $5,010 higher in 2010, $5,080 higher in 2011, $5,210 higher in 2012, $5,340 higher in 2013, $5,430 higher in 2014, and $5,520 higher in 2015.
Source: Tax Policy Center, http://www.taxpolicycenter.org/taxfacts/displayafact.cfm?Docid=36
Last visited November 14, 2014
[2] Nominal dollars for 2014 and 2015.

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.
Sources: Internal Revenue Service (2014b); Tax Credits for Working Families (2011); Stokan (2013).

Table 3. In-work tax credits in the OECD

Country	Target group	Maximum value (in 2010 PPP USD)	Max phase-in rate	Max phase-out rate	Maximum income for eligibility (percent of average wage)	Family structure criterion
Belgium	Individual	$2,471	*	28%	61%	N
Canada	Families	$1,377	25%	15%	57%	N
Finland	Individual	$3,923	51%	5%	240%	N
Finland	Individual	$714	5%	1%	223%	N
France	Family	$1,298	8%	19%	90%	Y
Germany	Individual	$573	10%	10%	23%	N
Hungary	Individual	$1,444	17%	12%	187%	N
Ireland	Family	$14,863***	**	60%	97%	Y
Italy	Individual	$2,359	None	7%	197%	N
Korea	Family	$1,426	15%	24%	46%	Y
Netherlands	Individual	$1,752	12%	1%	infinite	N
New Zealand	Family	$2,080	**	20%	186%	Y
New Zealand	Individual	$347	**	13%	100%	N
Slovak Republic	Individual	$1,257	**	16%	infinite	Y
Spain	Individual	$556	None	10%	****	N
Sweden	Individual	$2,241	32%	None	Infinite	N
United Kingdom	Family	$6,667	**	39%	53%	Y
United States	Family	$5,038	40%	21%	88%	Y

Sources: OECD (2011, 2014, 2015); Owens (2005); World Bank (2014)
Notes: Table includes only programs that are generally applicable, without restrictions to specific subpopulations (e.g., the long-term unemployed). Where schedules vary with family structure, values shown are for families with two children.
*Not applicable or phase-in rate is not well defined (e.g., due to interactions with other taxes).
**No phase-in rate but available only if meet minimum hours or earnings criterion.
***Calculated on the basis of one earner working 19 hours per week at the minimum wage.
****Not reported by OECD.

Table 4. Distribution across EITC credit ranges, by demographic characteristics

	Percent in each credit range					Mean EITC in each range ($1000s)		
	Zero income, zero EITC	Phase-in	Plateau	Phase-out	Positive income, zero EITC	Phase-in	Plateau	Phase-out
All families	5.9	4.3	2.7	9.2	77.9	1.6	3.5	1.9
By number of children in family								
Zero	7.6	2.9	0.9	4.1	84.5	0.2	0.5	0.2
One	3.9	7.9	11.4	23.2	53.6	1.5	3.2	1.6
Two	2.8	7.6	4.8	19.9	65.0	3.0	5.2	2.7
Three or more	2.1	5.6	3.9	15.0	73.5	3.3	5.8	3.4
By family structure								
Single, no children	7.2	3.8	0.7	5.2	83.1	0.2	0.5	0.2
Single, with children	4.6	11.9	7.6	22.1	53.9	2.5	4.1	2.5
Married, no children	8.3	1.3	1.3	2.2	86.9	0.2	0.5	0.2
Married, with children	1.5	3.1	5.0	16.5	73.9	3.0	4.7	2.6
By imputed tax return type								
Joint, both <65	1.9	2.3	3.8	10.0	82.0	2.3	3.9	2.4
Joint, one	9.0	2.5	3.6	4.3	80.6	0.7	1.3	1.0
Joint, both 65+	26.4	0.2	0.1	0.5	72.9	2.3	3.2	1.0
Head of household	3.1	19.9	11.8	38.2	27.1	2.6	4.2	2.5
Single	6.7	3.4	0.6	4.8	84.5	0.2	0.5	0.2
By race/ethnicity of primary taxpayer								
White only	6.9	3.0	1.7	6.6	81.8	1.3	3.1	1.7
Black only	5.3	7.8	3.9	13.3	69.6	1.7	3.6	1.9
Hispanic	3.1	6.9	6.3	17.8	65.8	2.0	3.9	2.1
Other	4.0	4.3	2.5	9.0	80.3	1.6	3.1	1.8
By education of primary taxpayer								
Less than HS	11.0	10.6	7.3	18.7	52.4	1.8	4.0	2.1
HS graduate	8.2	5.3	3.7	11.5	71.4	1.5	3.5	1.9
Some college	5.1	4.4	2.4	9.7	78.5	1.6	3.4	1.9
BA or better	3.4	1.5	0.9	4.1	90.0	1.2	2.8	1.5
By age of primary taxpayer								
Age 15-29	1.2	5.6	3.8	8.0	81.5	1.7	3.4	1.9
Age 30-44	1.5	6.0	3.9	15.8	72.9	1.9	4.3	2.2
Age 45-59	2.3	3.7	2.1	8.7	83.2	1.1	2.8	1.5
Age 60-74	14.4	1.6	1.1	3.0	79.8	0.6	1.4	0.6
Age 75 plus	42.1	0.2	0.3	0.6	56.9	1.7	1.8	0.9

Source: Authors' analysis of the 2012 CPS ASEC.

Table 5. Number of EITC claims and dollars spent, 2011, IRS data vs. Current Population Survey.

	IRS		CPS		CPS / IRS (%)	
Number of qualifying children	Returns (millions)	Dollars (millions)	Returns (millions)	Dollars (millions)	Returns	Dollars
0	6.886	1,821	6.528	1,672	94.8	91.8
1	10.094	22,201	5.357	10,253	53.1	46.2
2	7.498	26,010	5.166	15,557	68.9	59.8
3+	3.433	12,874	4.050	14,778	118.0	114.8
All	27.912	62,906	21.101	42,260	75.6	67.2

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

Table 6. Concordance between EITC simulations in CPS and using tax return income

	Distribution of families (column %)			Probability elig. in CPS, if elig. in IRS	Probability elig. in IRS, if elig. in CPS
	All	EITC elig. (CPS)	EITC elig. (IRS)		
All households	100	100	100		
By number of children in family					
Zero	65.8	32.2	26.0	42.7	32.9
One	8.9	23.6	34.6	57.9	82.8
Two	12.2	24.4	26.4	62.9	87.4
Three or more	13.1	19.8	13.0	57.4	85.4
By imputed tax return type					
Joint, both <65	33.9	33.9	28.6	42.0	75.5
Joint, one or both 65+	8.4	2.0	1.5	40.5	53.4
Head of household	8.6	37.5	45.4	67.8	86.3
Single	49.1	26.6	24.5	48.4	57.1
By race/ethnicity of primary taxpayer					
White only	66.5	46.4	45.5	53.6	61.4
Black only	11.6	18.0	19.3	60.6	69.4
Hispanic	14.9	28.8	28.2	54.1	60.1
Other	7.0	6.8	7.0	54.9	57.4
By education of primary taxpayer					
Less than HS	8.8	20.0	18.6	51.9	59.1
HS graduate	27.7	35.2	35.5	53.1	61.0
Some college	31.2	31.8	32.2	60.8	65.9
BA or better	32.3	13.1	13.7	52.0	60.4
By age of primary taxpayer					
Age 15-29	23.0	24.7	27.6	51.9	64.7
Age 30-44	28.0	44.6	43.1	61.1	65.4
Age 45-59	27.7	25.0	23.8	51.4	58.0
Age 60+	21.4	5.8	5.5	41.7	45.8
By annual weeks worked					
0-25	24.9	27.8	25.7	38.3	43.5
26-49	11.6	18.1	16.7	67.4	69.8
50-52	63.6	54.2	57.5	59.1	69.8
By usual hours per week (if worked)					
0-19	5.2	19.5	34.6	48.0	51.4
20-34	14.8	22.2	16.8	68.3	69.8
35+	80.0	58.3	48.5	55.8	68.9
By hourly wage of primary taxpayer (if worked)					
<$10/hour	22.0	50.2	58.0	53.5	56.1
$10-15/hr	21.5	28.6	21.4	61.8	75.2
$15-20/hr	16.3	13.8	11.7	61.2	73.5
$20+/hr	40.2	7.4	8.9	42.5	66.9

Source: Authors' analysis of 2012 CPS ASEC, and Jones (2015).
Notes: Columns 1-2 from CPS. Column 3 is based on matched CPS-IRS data, and uses Form 1040 income measures in place of the CPS measures. Column 4 shows the share of tax units that appear EITC eligible when IRS data are used who are also eligible when CPS data are used, while column 5 shows the converse. IRS simulations are based on 75,963 tax return records and 115,281 W-2 records matched to 143,099 CPS records, covering about 95% of taxpayers (weighted). CPS records with imputed earnings (22%) or no linkage possible (7%) are excluded.

Table 7. Simulations of EITC incidence

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

Notes: Calculations are based on the estimates of Rothstein (2010), Table 5, Panel A, and correspond to $1 in EITC spending distributed across single and married women with children in proportion to their share of actual EITC spending.