REDISTRIBUTION AND TAX EXPENDITURES:
THE EARNED INCOME TAX CREDIT

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ABSTRACT

This paper examines the distributional and behavioral effects of the Earned Income Tax Credit (EITC).
We chart the growth of the program over time, and argue several expansions show that real responses
to taxes are important. We use tax data to show the distribution of benefits by income and family
size, and examine the impacts of hypothetical reforms (expansions and contractions) to the credit.
Finally, we calculate the efficiency effects of marginal changes to EITC parameters. Targeting the
EITC to lower-income families by raising the phase-out rate generates a welfare loss for single mothers,
primarily because of the disincentive to enter the labor market and not the traditional hours-of-work
distortion.

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"…[J]ust as it is impossible to understand life without considering death, it is impossible to understand economic redistribution through social spending without considering taxation. This is especially true for tax "expenditures," commonly known as loopholes or breaks, which reside in the depths of the tax code."[1]

1. Introduction

The primary means of providing cash assistance to lower-income families with children in the United States is now the federal income tax system. A series of tax acts starting with the 1986 Tax Reform Act—and running parallel to the erosion of the traditional welfare system—have increased assistance to the *working* poor through expansions of the Earned Income Tax Credit (EITC). In 2007, an estimated 22 million families are estimated to benefit from the tax credit, at a total cost to the federal government of more than 43 billion dollars (U.S. Office of Management and Budget 2008). Total federal spending on cash assistance for poor families in the Temporary Assistance for Needy Families (TANF), however, is projected to be only 16.5 billion dollars.

The increased reliance on the tax system to transfer money to needy families raises many issues related to efficiency and equity. The most glaring issue with the tax system as a transfer mechanism for the poor is arguably distributional: by transferring money only to working families, it fails to cover the poorest families. On the other hand, it rewards work and family.   It is widely accepted that the EITC has raised the employment of eligible women with children. Empirical evidence consistent with economic theory suggests that the EITC has been especially successful at promoting employment among eligible unmarried women with children (Eissa and Liebman 1996, Meyer and Rosenbaum 2000). In fact, the labor force participation rate of single mothers increased by an astounding 14 percentage points between 1989 and 2002, a period of substantial expansions in the size of the EITC. It is also generally accepted that the credit has been successful in reducing poverty (see Hotz and Scholz 2003). Census data indicate that the EITC removed almost five million people (over half of whom were children) from poverty in 2002, more than any other government program (Llobrera and Zahradnik 2004). These estimates reflect the intent of the 1993 EITC expansion to lift full-time workers earning the minimum wage out of poverty

This paper examines the distributional impacts of tax expenditures to lower-income families

[1]Edwin Amenta (1998), review of The Hidden Welfare State: Tax Expenditures and Social Policy in the United States.

through the Earned Income Tax Credit. We review the design of the EITC and trace its growth over time, as well as the evidence on the behavioral responses. Using tax data, we show the distributional patterns of EITC expenditures and examine how these patterns change with hypothetical reforms to the credit. We then use survey data from the Current Population Survey to calculate the efficiency effects of the EITC under marginal reforms.

2. Operation and History of the EITC

The EITC is a refundable tax credit that was introduced in the tax code in 1975. The credit is targeted at low to moderate income working families, and eligibility for the credit depends on the taxpayer's earned income (or in some cases adjusted gross income), and the number of qualifying children who meet certain age, relationship and residency tests. The taxpayer must have positive earned income, defined as wage and salary income, business self-employment income, and farm self-employment income. Further, the taxpayer must have adjusted gross income and earned income below a specified amount (in 2007, the maximum allowable income for a taxpayer with two or more children is $37,783). There are separate tax schedules by family size—a small credit for childless taxpayers, one for taxpayers with one child, and another (more generous payment) for taxpayers with two more children.[2]

The *total tax cost* of the EITC consists of two components. The *pure tax expenditure* is the amount by which the EITC reduces the amount of taxes owed. Because the EITC is refundable, however, there is also the *outlay* component—taxpayers receive a tax refund when the EITC exceeds their taxes owed. The outlay component is large: in 2004 the total tax cost of the EITC was $40 billon with a pure tax expenditure of $5 billion and an outlay of $35 billion. For the purposes of this paper and the analysis of the EITC, we are considering the total tax cost (tax expenditure plus outlay) as the relevant object of study.

Each of the credit schedules (for no children, one child, two or more children) consists of three regions. At the lowest levels of earnings, in the phase-in region, the EITC is equal to earnings times the *subsidy* (or *phase-in*) *rate*. In tax year 2007, the subsidy rate of the EITC is 34 percent for taxpayers with one child, 40 percent for taxpayers with two or more children, and 7.65 percent for childless taxpayers. Following the phase-in, there is a relatively small range of earnings—in the flat region—where the family

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[2] A "qualifying child" for the EITC must be under age 19 (or 24 if a full-time student) or permanently disabled and residing with the taxpayer for more than half the year.

receives the maximum credit. In 2007, the maximum credit is $2,853 for one child, $4,716 for two or more children, and $428 for childless filers. Finally, for earnings above the flat region—in the phase-out region—the credit is reduced at the *phase-out rate* (about 16 for one child, 21 percent for two or more children, and 7.65 for childless). The flat and phase-out regions of the EITC are extended by $2,000 for married filers in 2007; this is the only aspect of the credit schedule which varies by filing status. Overall, the 2007 EITC schedule is traced out in Figure 1. This illustrates the quite modest size (relatively) of the credit for childless taxpayers, and the large range of the phase-out region covering earnings well beyond the lowest income taxpayers. For comparison, 2006 median family income (not earnings) was $48,201 for all households and $31,818 among female headed households (DeNavas-Walt et al 2007).

Table 1 summarizes the parameters of the EITC over the history of the program. Originally, in 1975, the EITC was a modest program aimed at offsetting the social security payroll tax for low-income families with children. It was the outcome of a vigorous policy debate surrounding the efficacy of a Negative Income Tax (NIT) as a means of reducing poverty. The concern was that the NIT—which guarantees a minimum standard of living to everyone—would discourage labor market activity as it is gradually phased out. Ultimately the EITC was born out of a desire to reward work. Subsequently, the EITC expanded substantially through tax acts in 1986, 1990 and 1993. As part of the Tax Reform Act of 1986 (TRA86), by 1988 taxpayers with incomes between $11,000 and $18,576 became eligible for the credit and faced its phase-out marginal tax rate for the first time. The largest single expansion, as part of the Omnibus Reconciliation Act of 1993 (OBRA93), led to a large increase in the subsidy rate (and maximum credit) along with a modest increase in the phase-out rate. OBRA93 also introduced the credit for childless filers. Figure 2 shows the EITC credit in real terms before and after each of the three key tax acts (for families with children) and highlights the dramatic expansion of the credit over time, as well as its effects on the families of different sizes.

These expansions have led to a dramatic increase in the total cost of the EITC. Figure 3 shows the total real outlay (refundable portion) and the total real tax cost of the EITC from 1975 to 2004, with the difference being the pure tax expenditure. The figure clearly shows the rising expenditures associated with the 1986, 1990, and 1993 tax acts. Importantly, between 1990 and 1996 the program more than doubled in real terms. Figure 4 shows that much of this increase in costs is driven by the increase in the number of recipients—in 1995, 19 million filers received the EITC, 160% more than ten

years earlier.[3] Figure 3 also shows that the vast majority of the total tax cost—throughout the history of the EITC—derives from the refundable portion of the credit rather than the pure tax expenditure.

Given that the EITC primarily takes the form of a direct outlay, it is useful to outline the tradeoffs involved in transferring dollars through the tax system. The main advantage of redistribution through the tax system is the low administrative costs enabled by the use of income information already collected for tax purposes. This argument was made as early as 1962 by Milton Friedman in arguing for a negative income tax as the means of assisting low-income people (see also the discussion in Liebman 1998). Indeed, administrative costs amount to an estimated 0.5 percent of EITC benefits (IRS 2003). This compares to about 16 percent of the budget for traditional transfer programs (Green Book 2004). Further, there is less "stigma" associated with benefits received through the tax system than through welfare agencies, due to the lack of a separate application and "inquisition" by caseworkers. The net effect of the lower stigma is to increase take-up and well-being of those eligible for assistance. A disadvantage of administering benefits through the tax system is that the IRS is not as well suited to monitor compliance with the eligibility criteria other than income—such as verifying qualifying children, especially with intergenerational families and non-custodial parents. In addition, the "lump sum" nature of the EITC may require costly consumption smoothing for families. Finally, current year EITC is tied to prior year income, which may lead to inefficiencies given that employment and living arrangements change frequently for the low income population.

3. Who Gets the EITC? Distributional Analysis under Current Law

To profile the EITC population, we use data from the Statistics of Income Public Use Tax File, a nationally representative sample of all individual tax returns filed in a given tax year (IRS 2004). Our main analysis is based on 2004 tax-year data, though for historical analyses, we use 20 years of data spanning 1984 through 2004 data. The 2004 tax file includes 150,047 observations (drawn from about 130 million income tax returns filed). All our tabulations use the weights provided in the file.

In 2004, there were a total of 22.1 million EITC recipients with a total tax cost of 40.1 billion dollars. In Table 2, we show the distribution of recipients by the number of EITC qualified children, filing

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[3] At the same time as the federal EITC was expanding, many states introduced "add on" credits as part of their state income tax schedule. As of January 2006, a total of nineteen states and the District of Columbia have state EITC's, typically structuring their credits as a share of the federal credit, varying between 5 percent in Illinois to more than 40 percent in Minnesota and Wisconsin (Nagle and Johnson 2006). The cost of the state EITCs is estimated to be $1.5 billion (Okwuje and Johnson 2006).

status, and EITC credit range. The number of EITC returns is about evenly split between those with one child versus two or more children (8.4 million with one child and 9.2 million with two or more children). Owing to the more generous credit for larger families, however, filers with two or more children receive 62 percent of the total tax cost while those with one child receive 36 percent of expenditures. Childless recipients represent 21 percent of all EITC recipients—numbering 4.7 million in 2004—but only 2 percent of the total tax cost. Table 2 also shows that head of household filers (unmarried with children) represent 53 percent of EITC returns and 65 percent of tax expenditures. Married couples filing jointly make up a quarter of recipients and tax costs; the remaining quarter of recipients and 10 percent of tax costs go to single filers. This disproportionate share of unmarried filers among the EITC population reflects the higher eligibility rates—due to lower earnings and income—of single women with children. The average EITC benefit (refundable and nonrefundable) per recipient is $218 for those with no EITC qualified children, $1,715 for those with one child, and $2,693 for those with two or more children.

The distribution the credit dollars and recipients by EITC region—phase-in, flat, and phase-out— is also presented in Table 2. This distribution effectively determines the net labor supply effect of the EITC. About one quarter of EITC returns and expenditures go to filers in the phase-in or subsidy region. About 19 percent of recipients and 29 percent of the total tax cost is for recipients in the flat region, and fully 54 percent of recipients and 48 percent of the total tax cost is for recipients in the phase-out region. This shows that more than three-quarters of recipients have earnings in the flat and phase-out range where negative hours of work incentives are predicted (work incentives are discussed more fully in the next section). Married couple filers are even more likely to have income outside the phase-in range: tabulations by filing status and credit region (not in Table 2) show that about 84 percent of married EITC recipients have income in the flat or phase-out regions compared to 70 percent among head of household filers.

We extend this profile of EITC recipients by examining the distribution of tax filers and EITC recipients by ranges and deciles of cash income, in Table 3.[4] By design, the benefits of the EITC are concentrated at the bottom of the income distribution. About 35 percent of the EITC total tax cost goes to filers in the 3rd cash income decile ($11,163 to $17,100 in 2004). About a quarter of the tax cost is in

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[4] Cash income is constructed as AGI less state and local tax refunds, plus deductions for IRA, student loan interest, alimony paid, tuition & fees, health savings account, one-half of self-employment tax, penalty on early withdrawal of saving, self-employed health insurance, medical savings account, Keogh, tax-exempt interest, non-taxable social security benefits, and other income (if positive). Note that this excludes non-taxable income such as public assistance benefits. Finally, we follow the common practice of dropping those with negative income when presenting means of the bottom decile (but they are included in the totals). Those with negative income account for less than 1 percent of returns (weighted).

the each of the 2nd and 4th cash income deciles (with $5,302-$11,162 and $17,101-$23,570 respectively).

Notably, a somewhat smaller amount, 5 percent, goes to the very lowest cash income decile (below $5,301) where there are fewer eligible filers. The remaining 12 percent of the tax cost is above the 4th decile (almost all of that is in the 5th decile).

These distributional impacts across income deciles are highlighted in Figure 5. The top panel of the figure presents the distribution of EITC costs and recipients by income decline, as previously shown in Table 3. Overall, it may be surprising that the EITC benefits taxfilers all the way into the *fifth* decile of the income distribution where incomes range from $23,570 to $31,650 (and does not benefit taxpayers in the bottom income decile). In Panel B, we define the income deciles based on "family size equivalent" income measures. In particular, we follow the practice of CBO by dividing family income by the square root of family size for the purpose of ranking families. Using this alternative definition of income deciles, we find that the EITC tax cost to be more concentrated in the lowest deciles—almost three-quarters of the tax cost are in deciles two and three. For the remainder of the paper, we return to our original income deciles (unadjusted for family size).

The distribution of the EITC tax cost by income decile for tax years 1984 through 2004 (figure 6) shows the benefits have shifted from the bottom decile further up the income distribution to the 4th decile and above. Interestingly, most of the change occurs around the expansions in TRA86, with less dramatic effects of OBRA90 and OBRA93.

Finally, we find a distinct geographic pattern in the distribution of EITC tax expenditures (Figure 7).   This figure plots EITC expenditures per state tax-filer for each of the 50 states (and the District of Columbia).[5] As one might expect, the per-filer EITC tax cost is highest in the poorest states (Louisiana $617, Mississippi $616, District of Columbia $570, Alabama $505, Georgia $504). The tax cost per filer tends to be lowest in richer states (Vermont $121, Hawaii $139, Massachusetts $159, Connecticut $161, Maryland $168) as well as states that have fewer filing units with children (Wyoming $102, North Dakota $152).

4. Behavioral Effects of the EITC

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[5] Note that this is a measure of the tax benefits per state not state *tax burdens*. The burden is faced by all taxpayers, not just state residents.

A primary motivation for recent expansions of the EITC is to reward the values of "work and family." In this section, we discuss the incentives created by the credit for work and family formation, and review the empirical evidence.

Labor Supply Incentives

A key design feature of the EITC and what distinguishes is from traditional income support programs, is that the EITC is only provided to working families and in so doing promotes work. However, the additional tax from the phase-out rate is expected to reduce work among those already in the labor force. Thus the overall prediction is an increase in the extensive margin and a reduction in the intensive margin of labor supply.

Consider first families with one parent or one potential earner. Figure 8 presents a stylized budget constraint, plotting hours worked on the horizontal axis against after tax income on the vertical axis, ignoring for simplicity all other features of the tax-transfer system outside the EITC. In the absence of the EITC, the taxpayer earns a gross wage *w* for each hour worked—hence the no-EITC budget constraint is given by segment AD, with slope *w*. The EITC alters the budget constraint to ABCD. In the phase-in region (AB), the EITC acts as a pure wage subsidy and increases the net wage from *w* to $w(1+\tau_S)$ where τ_S is the subsidy rate (34 percent for one child, 40 percent for two or more). In the flat region of the credit (BC), the taxpayer's budget constraint is shifted out an amount equal to the maximum credit and her gross (and net of tax) hourly wage is *w*. Each dollar earned in the phase-out region of the EITC (CD) reduces the credit by a phase-out rate of τ_p (about 21 percent) leading to a net of tax wage of $w(1-\tau_p)$. The net of tax wage in the phase-out will be lowered further once the taxpayer starts paying federal tax.

The figure shows that the well-being of a taxpayer who is not working is not affected by the EITC. Any taxpayer who preferred working before will still prefer working, and some taxpayers may find that the additional after-tax income from the EITC makes it worth entering the labor force. Therefore, the impact of introducing or expanding the EITC on the labor force participation of unmarried taxpayers is unambiguously positive—a positive extensive margin effect.

The impact of the EITC on the hours worked by a single working taxpayer, however, is generally expected to be negative but depends on which region of the credit the woman is in before the credit is

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expanded or introduced. If she is in the phase-in region, the EITC leads to an ambiguous impact on hours worked due to the negative income effect and positive substitution effect. In the flat region and phase-out regions, however, the EITC is expected to reduce hours through a negative income effect, and additionally in the phase-out, a negative substitution effect. Moreover, the phase-out of the credit alters the budget set in such a way that some taxpayers with incomes beyond the phase-out region may choose to reduce their hours of work and take advantage of the credit. In practice most EITC recipients have income beyond the phase-in: for example in 2004 about 70 percent of single filers and 84 of married filers receiving the EITC have earnings in the flat or phase-out region of the credit (more on this below). Thus the expectation is that the EITC will reduce the number of hours worked by most eligible single taxpayers already in the labor force.

These labor supply incentives are substantial. Eissa and Hoynes (2006b) show that in 2004 a single filer with one child earning $10 per hour considering part-time work faces a average tax rate of *negative* 10 percent (a subsidy), compared to a tax rate of 15 percent without the EITC—a reduction in the participation tax of 25 percentage points. Further, recipients with incomes in the phase-out range face marginal tax rates that are high by federal income tax standards. NBER TAXSIM-simulated marginal tax rates on 2004 earnings for a single filer with two children are shown in Figure 9. For these simulations, we assume that the family only has earned income, takes the standard deduction, and the tax calculation ignores state income taxes, the AMT, and the payroll tax. This figure shows that the marginal tax rates in the phase-out are higher than those experienced by taxpayers at far greater earnings.

In contrast to the predictions for single women, the EITC is expected to reduce the participation and hours worked of most eligible married women. This occurs also because the credit is based on *family* earnings and income. Suppose family labor supply follows a sequential model, with the husband as the primary earner and the wife as the secondary earner. In this model, the effect of the credit on the labor supply of primary earners is the same as that of single taxpayers—incentives to participate in the labor market strengthen unambiguously while hours of work incentives are ambiguous, though likely negative given the distribution of taxpayer income along the EITC schedule.

The impact of the EITC on secondary earners is more complicated because it depends on the earnings of the primary earner. Assume for simplicity that the husband is the primary earner, and further that his earnings place the family in the phase-out range. The family receives the credit if the

wife remains out of the labor force, but the credit amount will decrease with each dollar earned if she enters the labor market. In the phase-out range, therefore, the EITC unambiguously reduces hours worked <u>and</u> participation, by raising family after-tax income and reducing the net-of-tax wage. If the husband's earnings place the family in the flat region, the credit unambiguously lowers labor-market participation and hours worked by married women (through a pure income effect). Of course, it is also possible for the wife's work effort to increase the family's credit if the husband's earnings are in the subsidy region (up to $8,390 or $11,790 in 2007 depending on the number of children), but very few married couples are likely to have incomes in this range. Given the distribution of income, it is unlikely the EITC will have any positive effect on the intensive or extensive margins of labor supply of married women.

Empirical Evidence on Labor Supply

A large body of work has examined the behavioral responses to the EITC. Here we touch on the major findings in the literature; those interested in a more comprehensive review should see Hotz and Scholz (2003) and Eissa and Hoynes (2006b).

Much of the empirical literature focuses on estimating the incentive effects on labor supply for single mothers. That work shows consistently that the EITC leads to significant increases in employment (extensive margin) but there is little evidence that the EITC leads to a reduction in labor supply for those in the labor market (intensive margin). Perhaps most striking about these findings is their consistency across different empirical methods—including quasi-experimental methods (Eissa and Liebman 1996, Ellwood 2000, Hotz et al 2002, Meyer and Rosenbaum 2000, and Rothstein 2007) and more structural methods (Dickert et al 1995 and Meyer and Rosenbaum 2001)—as well as different EITC expansions.

Evaluations of the large federal expansions in the credit in 1986, 1990, and 1993 typically use difference-in-difference models and compare changes for a treated group (e.g. single mothers with children) to a control group (e.g. single mothers without children). The control group is introduced to control for other factors that may be contemporaneous with the policy changes. The EITC design and expansions suggest a number of possible strategies—such as comparing women with different family sizes (presence and number of children), marital status, earnings or education levels—for identifying labor supply responses. These models seem to work well and provide robust estimates for the impact of the EITC on participation, but may be less well suited for estimating the impacts on hours worked. Analyzing the determinants of hours worked is more complicated due to the changes in the composition

of the working sample and selection into work more generally.

To illustrate the findings from the difference-in-difference literature, Figure 10 presents annual employment rates for women by marital status and presence of children for 1983-2006.[6] The figure shows the dramatic increase in employment rates for single women with children compared to single women without children. Most of this change occurred between 1992 and 1999 where employment rates for single women with children increased by 16 percentage points. This is during the period of the largest expansion in the EITC due to OBRA 1993. Over this same period, there was little change in employment rates of single women without children. Others have shown that the groups with the most to gain from EITC expansions (e.g, women with lower wages, lower education levels, more children, and single women) experienced larger gains in employment rates (Ellwood 2000, Meyer and Rosenbaum 2000, Rothstein 2007).

Eissa and Liebman (1996) find that the 1986 expansion of the EITC led to a 2.8 percentage point increase in employment rates (relative to the base of 74.2) for single mothers. Meyer and Rosenbaum (2001) find that 60 percent of the 8.7 percentage point increase in annual employment single mothers between 1984 and 1996 is due to the EITC. They find that a smaller amount, 35 percent of the increase in employment between 1992 and 1996 is due to the EITC (with the remainder due to welfare reform and other changes). The range of the implied employment elasticity with respect to net income across all studies is quite narrow—between 0.69 and 1.16 (Hotz and Scholz 2003).

A few papers examine the impact of EITC on hours for single mothers already in the labor market (Eissa and Liebman 1996, Meyer and Rosenbaum 1999, Rothstein 2007). In sharp contrast to the findings above, however, there is little evidence consistent with the expected negative intensive margin effect. Some studies estimate positive effects, some negative, and most are statistically insignificant. Another source of evidence builds on the prediction from labor supply theory that taxpayers should be bunched at the kinks in the EITC schedule (and should be less present at the end of the EITC schedule). Liebman (1998) and Saez (2002b) use tax return data and find no evidence of consistent with these predictions.

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[6] These tabulations are calculated using the 1984-2007 March Current Population Surveys. The sample includes all women aged 19-44 who are not in school or disabled. We also drop the relatively small number of women who report working positive hours but have zero earnings or report positive earnings but zero hours. For these calculations, employment is defined by any work over the (prior) calendar year.

This finding—of a significant extensive margin effect but no intensive margin effect—is consistent with the current consensus that intensive labor supply elasticities are relatively small. It might also be that EITC recipients are not fully aware of the structure of the EITC schedule. They receive the EITC as lump sum payment with their tax return and have few opportunities to learn about the schedule.

There are fewer studies on the incentive effects for married couples; but the available evidence is consistent with the theoretical expectations. Eissa and Hoynes (2004) and Ellwood (2000) find that EITC expansions led to modest reductions in employment rates of married women. Eissa and Hoynes (2004), for example, compare married mothers to married women without children and find that the 1993 EITC expansion led to a one percentage point reduction in the participation rate of married mothers. Eissa and Hoynes (2006a) use instrumental variables methods and find that EITC expansions from 1984-1996 led to a small—one to four percent—decrease in annual hours for working married women with children. Heim (2005) estimates a structural model of family labor supply and finds similar impacts on hours worked of married women (yet he finds no impact of the EITC on employment of married women).

Tax Cost of Marriage

Because the EITC is based on family income and because the same credit schedule applies to all taxpayers with children regardless of marital status[7], the EITC is not neutral with respect to marriage. By non-marriage neutrality, it is meant that the credit for a married couple differs from that for two unmarried individuals with the same total income and family size. Marriage non-neutrality is not unique to the EITC, however. Both federal and state taxes (Feenberg and Rosen 1995) and traditional transfer programs generally are not marriage neutral. Other, less-prominent, provisions in the tax code that generate marriage non-neutrality include those related to the child-care tax credit. Together these features operate to tax marriage in some cases and subsidize it in other cases.

To see how this works, consider an extreme case: a married couple in 2004 with four children, each earning $14,000 for a total of $28,000. Their credit is $1,570. If they divorce and each takes 2 children, their credit jumps to $8,600. Their marriage costs them over $7,000 in lost earned income credit (or 25 percent of their joint income). On the other hand, very low income people may gain from marriage. Consider a single parent with two children who earns $5,000 gets and EITC of $2000. If she

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[7] To offset the marriage penalty associated with the EITC, EGGTRA expanded the size of the flat credit for married filers

marries someone earning $10,000, for a combined income, their credit jumps to $4100 (for a marriage bonus of $2,100, or 14 percent of their joint income).

In tax year 1999 [need to update], approximately 48 percent of couples filing a joint federal tax return faced a marriage penalty averaging $1141, while 41 percent received a marriage bonus averaging $1274 (Bull *et al* 1999). These modest overall penalties mask substantial heterogeneity in the population. Penalized married taxpayers with less than $20,000 earned income face an average marriage penalty of 8 percent of income. A significant share of marriage penalties and subsidies incurred by lower income families is caused by the loss of the EITC (CBO 1997).

Relatively little empirical work has examined the impact of the combined tax and transfer system on the family (see for example, Dickert-Conlin and Houser -DCH-1998, Eissa and Hoynes –EH-2000a,b).   Consistent with the work on traditional welfare programs, DCH find no effect of taxes and transfers on the decision of females to become heads of household (through out-of-wedlock birth or divorce). Eissa and Hoynes (2000a) document the changes to the tax consequence of marriage from 1984 to 1997, and show it declined following the flattening of the federal tax schedule in 1986 but then subsequently increase in the period after. They use this time variation in the tax consequence of marriage, augmented with the impact of welfare (ADFC/Food Stamps/Medicaid) to examine the impact on the propensity of women to be married, and find a small impact of the tax-transfer system on marriage (EH 2000b).   On balance, the evidence suggests the tax consequence of marriage has a minor impact on behavior and raises mostly distributional concerns.

Should the Tax System be Neutral with Respect to Marriage?
While nearly 60 provisions of the federal income tax code alter tax liability by marital status (GAO, 1997), it is primarily the combination of a progressive income tax schedule and taxation on the basis of total family income that generates marriage non-neutrality. Although marriage neutrality of the tax code has been espoused by some, it is not at all clear that the tax system should treat marriage neutrally. On the one hand, the notion of horizontal equity suggests that marriage should be taxed because couples benefit from economies of scale deriving from sharing resources. The benefits of economies of scale accrue to any group of individuals residing together, however, and are not taxed generally if they accrue to cohabiting couples, adult children living with parents, or group-home residents. On the other hand, marriage confers social benefits primarily in the form of child wellbeing.

To the extent that the relationship between marriage and child well-being is causal, and to the extent that individual marriage decisions ignore the social benefits, a strong argument for government intervention emerges. Here, the tax code should subsidize marriage. In addition, the strong correlation between poverty and single-parent families suggests that marriage may be viewed as a cost-effective poverty alleviation policy.

The 2001 and 2003 tax cuts lowered marriage penalties by adjusting the size of the maximum EITC credit region for married couples, and by making the standard deduction and 15 percent bracket twice the size as for a single taxpayer. Making these permanent is likely to be very costly, however, about $130 billion dollars over the 2008-2017 budget window (Tax Policy Center, 2007).

5. Hypothetical Reforms to the EITC

To examine more comprehensively the impact of the EITC, we evaluate several hypothetical reforms to the credit. We consider six reforms that alternatively expand and contract the program. Table 4 presents the parameters for 2004 (current) law—Panel A—and for each reform. Panel B presents two reforms that expand the program by (1) increasing the phase-in (subsidy) rate, maximum credit and phase-out rate, and (2) expands the credit for childless adults. Panel C presents the parameters of, what we term, "universal" reforms, which reduce the phase-out rate to be one-third the current-law rate (5.33% and 7.02% for one versus two or more child-families, respectively) and thereby expand eligibility further up earnings distribution. Panel D presents the parameters for "targeted" reforms, which raise the phase-out rate three-fold (47.94% and 63.18%, respectively) and thereby focus the credit on lower-earning taxfilers[8]. For the universal and targeted reforms, we consider both non-revenue neutral and revenue-neutral variations. We impose revenue neutrality in a specific way, by adjusting the maximum credit (and hence the phase-in rate of the credit) but holding fixed the income cutoffs for the initial two credit regions. Our discussion focuses on the revenue-neutral versions, since they are arguably more realistic and highlight more clearly the distributional tradeoffs implicit in the current design of spending $40 billion in this refundable credit. In each case, we examine distributional impacts, but also discuss the likely efficiency (labor supply) consequences. Our welfare analysis of these large reforms is only

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[8] Other simulations that are of interest to the wider tax expenditures project are removing the "AMT patch" and eliminating the 2001 and 2003 tax cuts. We have examined these scenarios and show that they lead to no significant changes for the EITC. Thus we have chosen to not present them here although they are available on request. In an effort to lesson the marriage penalty, the 2001 tax act did expand the flat and phase-out regions of the EITC for married couples (as illustrated in Figure 1 and specified in the notes to Table 1). In practice, these changes were modest in size and impact.

suggestive, however, since a full blown analysis with parametric utility functions and social welfare weights is beyond the scope of this paper (see Liebman 2002 for such an analysis). We defer discussion of "marginal reforms"—Panels E and F—to Section 6, in which we carry out a welfare evaluation of different EITC phase-out rates.

Our evaluation here is based on the 2004 SOI Public Use Tax Data used to profile the EITC population. Using those data and the NBER's TAXSIM model, we recalculate each taxfiler's tax liability, marginal tax rate under the alternative EITC policies, and aggregate to get the number of recipients and total cost[9]. More precisely, marginal and average tax rates are defined for each dollar of *earned* income, and do not include payroll taxes (we also relax this assumption in section 6) or state income taxes. The simulated values are used to populate distributional tables similar to those presented above under current law, allowing us to infer the likely distributional and efficiency consequences of each reform.

Two caveats are worth noting. The simulations of total cost, number of recipients and (marginal and average) tax rates are static, and so assume no change in labor supply or earnings (we relax this assumption in Section 6).[10] In addition, by using the 2004 SOI data, our results are limited to the existing sample of filers.

We present the simulated number of EITC recipients, total EITC tax cost, and distribution of the EITC tax cost by number of children, filing status, and cash income decile under current law and the alternative policies in Table 5[11]. We compare marginal and average tax rates under current and the alternative policies in Table 6. Below, we discuss each reform separately, considering first expansionary reforms.

A: Expansionary Reform 1: Increased Subsidy Rate
Our first expansion broadly expands the program by increasing the phase-in rate by about one-third: from 34 to 46 percent for parents with one child and from 40 to 54 percent for those with two or more children (see Figure 11a). We hold fixed the size of the phase-in and flat regions and so raise the

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[9] Dan Feenberg was incredibly helpful in coding up all of the alternative EITC policies and making this analysis possible with TAXSIM.

[10] For married couples, we calculate the marginal tax rate for the primary earner.

[11] Note that the numbers for "current law" in Table 5 differ slightly from the results presented earlier in Tables 2-3. The current law numbers in Table 5 use TAXSIM to calculate the EITC under current law assuming 100% take-up. This provides the best comparison to the simulations of the alternative policies. Our recalculation of current law shows 22.9 million recipients (compared to 22.1 under current law) with most of these additional recipients in the childless group.

maximum credit to $3,487 ($5,754) for those with one child (two more children).[12] It is worth noting that this reform does not expand eligibility very far up the income distribution. The maximum income for the EITC rises by about 18 to 20 percent (to $35,861 and $41, 362) relative to current law.

This expansion covers an additional 2.5 million tax-filers (11 percent) but does so at a high cost--$20 billion (or 50 percent of current law expenditures). This expansion creates winners and no losers (except for taxpayers who finance the additional expenditures). Still, it is useful to note where the dollars flow and how that changes with the alternative policy. The distribution of the tax cost seems to vary little by number of children and filing status, though it does benefit taxpayers with children (especially with more than one child) and joint filers relative to head of household and single filers. This reform, on the other hand, transfers most of the dollars to taxfilers with higher incomes. This occurs both across EITC regions and across the cash-income distribution. Essentially all the benefits accrue to tax-filers in the phase out region—who under current law receive 49.4 percent of the dollars and under the expanded program end up with 52.1 percent. Those who gain most have income in the 5th and 6th deciles of the distribution (above $23,570).

In addition to the distribution of benefits, we examine the impact of EITC reforms on average and marginal tax rates. Simulations, presented in Table 6, show this expansion reduces average tax rates (calculated as tax liability relative to earned income) for most for head of household filers (by -4.7 percentage points), and for taxpayers in the flat region of the EITC (by -4.9 percentage points). The table also breaks out the impact on newly eligible taxpayers (with incomes between the current law maximum and $35,861 and $41,362), and shows their tax liability declines by about 1.2 percentage points. The cash income distribution shows all filers below the 7th decile benefit, but that the largest gains accrue to the second and third decile (mirroring the flat region). By reducing the tax liability, this reform expands the budget set for all eligible filers and thereby provides stronger incentives for non-workers to enter the labor market. As a consequence, it creates welfare gains along that margin of labor supply.[13]

The EITC expansion considered here reduces marginal tax rates (higher subsidy rates) for some recipients and raises them (higher phase-out rates) for other recipients. This renders the pattern of marginal tax rates far less consistent than that of average rates (see the bottom panel of Table 6). Head of household and single filers face lower marginal rates, while joint filers face a slightly higher marginal

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[12] This policy assumes no change to the credit for the childless.
[13] For a full discussion of welfare effects along the discrete labor force participation margin, see Section 6 and Appendix A.

tax rate on earnings.   By income, the simulation shows marginal tax rates decline for lower-income filers (in the phase-in and flat regions, and below the second decile) and rise for those with higher incomes. Not surprisingly, newly eligible filers face a marginal rate that is nearly 15 percentage points greater than under current law, as they enter into the phase-out region.   These filers have income in the 5th and 6th decile of the distribution and thereby explain the observed rise in marginal tax rates at those points. Applying a traditional Harberger analysis suggests welfare losses on balance from the marginal rate changes because the increases hit a thicker part of the income distribution. This is especially the case if the elasticity of hours worked with respect to the tax rate increases with income.

B: Expansionary reform 2: Increase Childless Adult EITC

Our second expansionary reform is based on the recent proposal by the U.S. House Ways and Means Committee to expand the EITC for childless filers (the Rangel proposal). The proposal doubles the subsidy rate (to 15.3 percent) to cover fully the Social Security and Medicare payroll tax rate (and doubles the maximum credit), expands the size of the flat region, and doubles the phase-out rate to 15.3 percent. This reform expands eligibility to those with incomes up to $15,998 (from its current-law level of $11,490).

Figure 11(b) illustrates this reform and shows it to be a relatively modest expansion. . It is simulated to cover an additional 3.3million taxfilers (14 percent) and cost about 2.8 billion per year (7 percent over current law).   The distribution of the EITC tax cost changes in predicable ways. More benefits go to single filers and to filers with no children, but also to the phase-in and (mainly) flat regions (relative to phase-out region). Expanding the childless adult credit reduces average tax rates for single filers (by 0.6 percentage points) and across the EITC distribution. More precisely, newly eligible recipients see a decline of 0.7 percentage points in their average rates. Evidence on the behavioral responses of (less-skilled) childless adults is limited, but inference from standard labor supply and tax work generally suggests small elasticities (cites).   In work that does not incorporate income taxes, Juhn (1992) finds substantial declines in labor market participation by less-skilled men in the 1970s and 1980s in response to deteriorating wage opportunities. If is therefore possible that this reform will generate some labor supply and efficiency gains.

C: Universal Reforms

Our second reform makes the credit more "universal" by extending substantially the reach of the phase-out region up the income distribution. That is accomplished by reducing the phase-out rate from the

15.98 (21.06) percent for families with one child (two or more children) under current law to 5.33 (7.02) percent, respectively. Static simulations show this expansion is projected to add $27 billion to the total annual cost of the EITC and cover an additional 12.5 million tax-filing units (Table 5). Because of the scale of this expansion, illustrated in Figure 12(a), we also consider a version that requires no additional revenues. The revenue-neutral expansion is paid for by reducing the maximum credit (and phase-in rate) by 30 percent, as we show in Figure 12(b).

The revenue-neutral reform is projected to cover 7.3 million (or 32 percent) more taxfilers. Although this reform costs essentially the same as current law (by design), it has dramatic distributional consequences. In relative terms, the credit flows away from unmarried parents (who have lower incomes in general) and towards married couples—who now receive 30.7 percent instead of 24.8 percent of the total benefits. In addition, the credit flows away from tax-filers in lower cash-income deciles to those in higher income deciles. About 70.5 percent of credit dollars go to filers in the bottom 4 deciles (with income below $23,570) under the revenue-neutral reform, down from 89.7 percent under current law.

The impact of these redirected benefits on tax liability and average tax rates is stark. Tax liability rises everywhere along the EITC schedule except for those who are newly eligible. The 7 million newly-eligible filers get a 1.5 percentage point reduction in their average tax rate. On a finer level, the distribution of average tax rate by cash income shows the revenue-neutral expansion of the credit benefits taxpayers above the 4th decile at the expense of all those with lower income. This redistribution comes at a cost for newly eligible taxpayers, however: higher marginal tax rates on hours worked between the 6th and 8th deciles of the cash income distribution. In fact, very low-cash income recipients also face higher marginal rates (as the subsidy rate is reduced). Any negative distortion to labor supply caused by these higher marginal rates is offset, however, by lower marginal rates (by 2 to 3.9 percentage points) for taxfilers right below the middle (in the 3rd, 4th and 5th income deciles) of the distribution. The efficiency consequences of this reform are therefore difficult to characterize, and ultimately depends as well on the relative size of the elasticity of hours worked across the cash-income distribution and the shares of income facing higher as opposed to lower rates.

D: Targeted Reforms

Our final set of large reforms target the credit by curtailing substantially the reach of the phase-out region. That is accomplished by raising sharply the phase-out rate from the 15.98 (21.06) percent for

families with one child (two or more children) under current law to 47.94 (63.18) percent respectively (see Figure 13a). These rates might seem entirely unrealistic, but we note they are quite modest for traditional welfare programs (e.g. AFDC/TANF). The net impact is to render ineligible taxfilers with one child and incomes between $19,472 and $30,338 ($20,846 and $34,458 for two or more children). Static simulations show this contraction of the EITC saves the federal government $13.4 billion annually, and eliminates 6.8 million tax-filing units from the program (Table 5).   The revenue-neutral version of this reform, illustrated in Figure 13b, redistributes the tax-revenue savings to a higher subsidy rate and thereby a higher maximum credit (by about one-third its current law level). The specific parameters are also presented in Panel D of Table 4.

On net, the revenue-neutral targeted EITC reform eliminates 5.4 million recipients (a decline of about 23 percent), who are more likely to be joint filers. Therefore, we observe redistribution from joint filers (who have higher incomes) to single and (mainly) head of household filers. There is very little redistribution between parents and childless adults in this reform. To the extent that joint filers have more children than head of household filers, there is possible residual redistribution to childless adults. Along the EITC schedule and cash-income distribution, the credit flows are as expected—from the phase-out to regions below—and from the 4th decile to deciles below. In fact, this reform transfers 88.7 percent of the credit to filers with incomes at or below the 3rd decile (compared to 66.9 percent under current law and 49.6 under the comparable universal reform).   Figure 14 illustrates further the different distribution of benefits under current law, and each reform of the revenue-neutral reforms (universal and targeted).

The targeted reforms reverse the relationship between average and marginal rates we observe for the universal reforms. Average rates fall for recipients in the phase-in and flat regions (and those with incomes below the 3rd deciles) at the expense of those no longer eligible for the EITC (and with higher incomes). One impact of this reform is stronger incentives for non-workers to enter the labor market: average tax rates decline by 4.7 percentage points for entrants into the flat region; and as a results welfare gains along the extensive margin.

Marginal tax rate changes, on the other hand, suggest substantial distortions to taxfilers in the phase-out region (where the increase in the MTR is fully 11 percentage points).   These are offset, however, by the lower marginal rates that newly ineligible filers now face –on the order of 15 percentage points. Along the cash-income distribution, marginal rates fall for everyone except those in

the 3rd and 4th deciles—who face 6.6 to 6.9 percentage point higher marginal tax rates. Distortions to hours worked for some are therefore offset by better incentives for others. This pattern again complicates somewhat the inference about the potential efficiency effects. Thought it seems reasonable to conclude that with elasticities that are larger on the extensive margin compared to the intensive margin, this reform has the potential to yield efficiency gains compared to current law.

6. Efficiency Impacts of the EITC

Previous work has argued that empirical evidence regarding the composition of labor supply responses (greater along the extensive than intensive margin) has important implications for the welfare evaluation of taxes. Saez (2002a) shows accounting for labor force participation responses can change the optimal transfer program. In particular, this work has shown that with sufficiently high participation elasticities, the optimal tax-transfer scheme can be similar to the EITC—with negative marginal tax rates at the bottom of the earnings distribution. An EITC would, on the other hand, be inefficient in a standard model with only intensive (hours worked) responses.[14]

Liebman (2002) also examines the optimal design of the EITC. He uses a micro-simulation model calibrated to 1999 CPS data to illustrate the trade-offs between efficiency and equity in the design of an EITC—including the optimal maximum credit, phase-in and phase-out rates—with fixed costs and participation effects. Liebman finds that the efficiency cost of transferring income through the EITC is substantially lower than previous studies have found, in large part because of the participation response of single mothers and the associated reduced welfare spending. His simulations suggest a cost of less than $2 to provide a transfer worth $1 to EITC recipients.

Eissa, Kleven and Kreiner (2008) take a different approach and examine the impact of participation responses on the welfare evaluation of actual tax reforms. They extend the standard framework for welfare evaluation of tax reforms to account for discrete labor market entry by way of nonconvexities in preferences and budget sets. Such non-convexities are significant because they allow first-order welfare effects along the extensive (participation) margin. Eissa, Kleven and Kreiner (EKK) simulate the effects of the 1986, 1990, 1993 and 2001 tax acts in the United States (incorporating all

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[14] Saez shows that the optimal program is instead a classical Negative Income Tax program, with a substantial income guarantee that is phased out a high rate.

federal income tax changes not just the EITC) and show that each had different effects on tax rates along the intensive and extensive margins. The 1993 expansion, for example, reduced the tax rates on labor force participation, but increased the marginal tax rates on hours worked for most workers. The authors show that conflating these two tax rates in welfare analysis can be fundamentally misleading. For tax reforms that change average tax rates differently than marginal tax rates (such as the 1993 expansion of the EITC), ignoring the participation margin can lead to even the wrong sign of the welfare effect.

Welfare Analysis of the EITC for Single Mothers

In this section, we apply EKK to evaluate the efficiency effects of "small" reforms of the EITC. Arguably, the EITC is unlikely to be overhauled in a major way, so this approach is more relevant for understanding the efficiency consequence of feasible reforms. Another advantage of examining small reforms is their simplicity and transparency. Larger reforms, such as those examined above, generate first-order labor supply and revenue effects; so that a full analysis of the welfare effect of the reforms would have to reflect the externalities created by changes in government revenue. Here, we avoid the need to specify utility functions or estimate (or calibrate) utility parameters, and the fixed costs of work that generate discrete responses along the extensive margin.

To simplify the analysis further, we focus our welfare analysis on single parents (head of household filers), who represent the largest group of recipients—accounting for about 65 percent of EITC recipients and dollars. This is also the group where discrete responses have been shown to be especially important.

EKK show the marginal deadweight burden of tax reform is given by the effect on government revenue from behavioral responses, where the behavioral revenue effect is related to the two different margins of labor supply response. The first effect captures the revenue effect from the change in the optimal hours of work for those who are working. The second effect captures the effect on revenue brought about by the tax-induced change in labor force participation. While the second effect on efficiency is related to the tax rate on labor force participation, the efficiency effect from changed working hours depends on the tax burden on the last dollar earned.

A full description of our simulation approach and the EKK deadweight loss formula is presented in an appendix. We review only the basic approach here. We start by creating a sample of single parents from the Current Population Survey (CPS). The CPS is better suited for this analysis because we

are explicitly interested in the participation response, and because the data include potentially eligible single parents who do not work or who do not file tax returns. For each sample member, we estimate a likelihood of labor market participation and potential earnings conditional on working, based on exogenous characteristics. This allows us to impute their earned income credit, and more generally their net tax liability. To be consistent and to avoid the problem of endogenous earnings and tax rates, we use imputed earnings for workers as well. Third, we use predicted earnings to simulate individual marginal and average tax rates under current law and under the marginal reforms. Finally, we calculate welfare effects based on imputed tax rates and assumed elasticities—as in equation (23) in EKK.

Tax rates are based on the NBER TAXSIM model -augmented by a simple welfare benefit calculator, and therefore account for both the tax and the transfer systems. Our measures of effective tax rates include federal and state taxes, payroll taxes and public assistance (cash, Food Stamps and Medicaid).[15] Welfare benefits are based on each person's state of residence and on the number of dependent children, and are adjusted to account for the implicit tax rates in each program (except for Medicaid), and for the less-than-100 percent take up rate (see Moffitt, 1992).

Impacts of Small Reforms on Tax Parameters

We consider two sets of simple "marginal" reforms to the EITC. First, we change the phase-out rate by +/- 1 percentage point (from 15.98 percent for single mothers with 1 child and 21.06 percent for those with two or more children). This extends the credit to taxfilers with $31,423 and $35,476 of income under the lower phase-out rate, and to $29,376 and $33, 532 under the higher rate, respectively. Second, we change the subsidy rate +/- 1 percentage point (from 34 and 40 percent respectively). The subsidy cut has a cutoff very similar to the phase-out rate increase, allowing us to evaluate the impact of transferring money to the same population but using different labor supply incentives. The full parameters of these moderate EITC reforms are shown in Panels E and F of Table 4.

Phase-out Rate

Panels A and B of Table 7a show the impact of changing the phase-out rate on the number of recipients and average and marginal tax rates. Making the EITC more generous lowers the overall tax burden on single mothers: the participation tax (benefit-adjusted average tax) rate falls by 0.2 percentage points, from 26.8 percent to 26.6 percent of wage income. This decline is somewhat higher for taxpayers in the

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[15] We assume workers bear the full incidence of employer payroll taxes, and adjust pre-tax wages accordingly. This adjustment reduces the effective taxation implied by all the different taxes and benefits, not just the payroll tax.

(current law) phase-out region than for newly eligible filers, but generally of the same order of magnitude. Marginal tax rates decline by a similar 0.3 percent overall but show a far less systematic pattern than participation tax rate: they fall by 0.7 percentage points for the 7.85 million EITC recipients in the (current-law) phase-out region and increase by a full 10.7 percentage points for the 0.212 million newly eligible recipients. The average tax wedge, not reported in the table, is about 0.424 on the extensive margin, and 0.532 on the intensive margin. Panel B of Table 7a shows the impact of making the EITC less generous has similar impacts (to Panel A) that are of the opposite sign. About 240,000 taxpayers in the (current-law) phase-out of the EITC would lose eligibility, and face marginal tax rates that are on average 11.3 percentage points lower than under current law.

Subsidy Rate

Panels C and D of Table 7a show the impact of changing the subsidy rate on the number of recipients, and on average and marginal tax rates. Reducing the subsidy rate by 1 percentage point, holding all other parameters fixed, reduces the maximum credit (see Panel F of Table 4) and eliminates 118,000 recipients. The smaller credit raises the overall tax burden and makes entry into the labor market less rewarding:--the overall participation tax rate (among EITC eligibles) rises by 0.6 percentage points. Even though the (average) marginal tax rate remains unchanged, it falls substantially for taxpayers no longer eligible to receive the credit, by 10.3 percentage points. Subsidizing earnings at a higher rate has symmetric effects of the opposite sign (Panel D).

The results in Table 7a show the two instruments (subsidy rate and phase-out rate) have different effects on the participation and marginal tax rates. Using the subsidy rate leads to a greater impact on the participation tax (because of the impact on taxpayers throughout the EITC eligible range), while the phase-out rate has a slightly stronger impact on the marginal tax rate (because of the concentration of recipients along that segment).

Impacts of Small Reforms on Welfare

Table 7b presents the efficiency analysis. We present welfare effects along the extensive and intensive margins of work under different assumptions about the elasticity. Our baseline ("middle") elasticity assumption includes a moderate total labor supply elasticity of 0.4, most of which is due to participation (with an elasticity [η] of 0.3). The intensive, compensated hours-of-work elasticity (ε) is then 0.1. To examine the impact of the size and the composition of the total elasticity on welfare, we evaluate three other cases: "low", "high" and "reversed middle" elasticity (with hours being more elastic than participation). We also present the "traditional" welfare effect, based only on the intensive margin. The

total welfare gain as a percentage of aggregate labor income is reported in column (3), and can be decomposed into the effect created along the intensive margin (column 1) and along the extensive margin (column 2).

Phase-out Rate

The welfare effects are somewhat striking. Our baseline elasticity assumption implies welfare gains for all reforms of the phase-out rate. We find a welfare loss for the more targeted EITC (higher phase-out) only in the case in which the overall elasticity is small (0.2) and hours-or-work do not respond. Panels A and B show the welfare gains occur along the intensive-margin (regardless of whether the phase-out rate is increased or reduced) and generally dominate the extensive margin effects). Notably, the extensive margin generates welfare effects that depend on the direction of the change in the participation tax rate: a lower (higher) phase-out rate generates efficiency gains (losses) because the tax burden declines (rises) and more (fewer) single mothers enter the labor market.

The intensive-margin welfare effects show the importance of the distribution of taxpayers along the EITC schedule and individual heterogeneity. Here, the interaction of the tax wedge with the EITC segment along which the taxpayer is located (and the associated change in marginal rates) is critical. The baseline elasticity leads to an intensive-margin efficiency gain of 0.022 percent of wage income with a lower-phase-out rate (Panel A). This result implies the welfare loss for newly eligible taxpayers (whose marginal tax rate rises by 10.7 percentage points) is smaller than that of existing eligible recipients in the phase-out region. We also find –unexpectedly– a welfare gain (0.050 percent of wage income) with a higher phase-out rate. This occurs because the efficiency gains for 240,000 newly ineligible taxpayers– whose marginal tax rates fall by 11.3 percent—dominates the welfare loss for the recipients whose marginal rate rises by 0.8 percentage points. The lack of symmetry between these two results occurs because of the difference in the taxpayers most affected by each reform (newly ineligible and newly eligible). For example, the average tax wedge prior to the reform was 0.828 for taxpayers made ineligible by the higher phase-out rate and 0.482 for those made newly eligible by the lower rate.

Accounting for the participation response affects the size, and in some cases the sign, of the welfare effect (columns 3 and 4). The results show generally larger welfare effects when only the intensive margin is accounted for (as in the traditional model). Per dollar spent, the welfare gain rises with the total elasticity when the phase-out rate is reduced, and declines when it is raised (column 5). Our results show the welfare gain per dollar spent (the marginal cost of funds-MCF-) is very sensitive to

the specific reform. A higher phase-out rate implies gains of less than 1 percent of wage income for most reasonable elasticity estimates (Panel B). On the other hand, the results in Panel A suggest if labor supply were highly responsive, a lower phase-out rate could be justified without appealing to any welfare weights for the taxpayers who gain for most estimates of the MCF.

Subsidy Rate

Panels C and D show a similar pattern of efficiency effects when the instrument is instead the subsidy rate. These reforms actually *raise* overall welfare (column 3) for all but the "low" elasticity in the lower-subsidy case because of offsetting intensive- and extensive-margin effects. The intensive-margin efficiency effects are generally of the opposite sign to what intuition might initially suggest, but the reason is that a lower subsidy rate generates welfare gains because fewer workers face the high marginal tax rates in the phase-out of the EITC. This effect dominates because these workers have higher wages and because their tax rates change by a much larger amount than those in the first segment of the credit. It is worth noting the extensive margin welfare effects are again symmetric (column 2), and are negative when the tax burden rises (Panel C) and positive when the tax burden falls (Panel D).

The results for increasing the subsidy rate (Panel D) also show the importance of accounting for heterogeneity in evaluating welfare effects. The traditional efficiency analysis predicts a welfare loss from this expansion of the EITC (see negative numbers in column 4). This occurs even though the marginal tax rate falls for taxpayers in the first segment of the credit, because fewer workers are in that segment and because marginal tax rates rise by about 10 percentage points (31 percent) for taxpayers newly eligible for the expanded credit. The total welfare gain (column 3), however, is small and little affected by the different elasticities. We note a higher hours-worked elasticity reverses the sign in this case. Because of the interaction of marginal tax rate changes and the location of taxpayers along the schedules, reversing the composition of the elasticity to be greater along the hours worked margin (the "middle reversed" case) reverses the welfare effect to be negative.

Comparing the welfare effects per dollar spent for the two instruments shows they are more sensitive to the elasticity when the phase-out rate is changed. It also shows contractions of the credit (higher phase-out/lower subsidy) generate smaller welfare gains than expansions of the credit (lower phase-out/higher subsidy).

7. Conclusion

The Earned Income Tax Credit is one of the ten costliest tax expenditures in the federal income tax system (GAO 2005). The total tax cost of the EITC, including the pure tax expenditure as well as the outlay, is 40 billion dollars in 2004. The justification for the existence of this tax expenditure is redistributive—the EITC provides transfers through the tax system to low and moderate income working families. The structure of the EITC—basically taking the form of an earnings subsidy that is phased out at earnings above around $15,000—provides incentives to increase employment rates while increasing after tax income. This structure likely increases the desirability of the EITC compared to transfers through traditional welfare programs appealing to efficiency (promoting work) and equity (working poor having greater social welfare weights than the non-working poor) arguments.

Why a transfer like this is provided through the tax rather than transfer system is not completely clear. There may be an efficiency gain to administering the EITC through the tax system given that the credit depends on earnings and adjusted gross income. Further, there may lower "stigma" with a tax based benefit, thereby increasing take-up and individual welfare. However, the IRS may not be well suited to monitor the compliance with other aspects of the credit eligibility—such as verifying qualifying children.

In this paper, we take the discussion above as a starting point and a guide for identifying the important questions concerning the EITC as a tax expenditure. We review the history and operations of the EITC, describe the incentive effects of the EITC, and review the empirical literature on measuring the incentive effects. We then use a large representative sample of tax filers to carefully document the distributional impacts of the EITC, examining how the tax cost varies by family size, filing status, income, and state of residence.

After establishing the basic distributional results, we consider how the tax cost and its distribution change with several hypothetical EITC reforms. We consider expansionary reforms (including expanding the credit for the childless), reforms that make the credit more universal (expanding further up the earnings distribution), and reforms that make the credit more targeted. For the universal and targeted reforms we focus on revenue neutral versions of these policies. In addition to exploring the distributional implications of reform we also discuss how the policies change incentives for work by simulating the changes to marginal and average tax rates.

Finally we apply the approach in Eissa, Kleven and Kreiner (2008) to conduct a welfare analysis of the EITC for single parents. This allows us to capture the efficiency associated with the extensive and intensive margins of labor supply. We show making the EITC more generous by reducing the phase-out rate is welfare improving, and for some elasticities, could be justified without appealing to any welfare weights for single mother. Changing the subsidy rate does generate welfare gains, but of a small size, and so could only be justified with substantial weights on the welfare of single mothers.

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Appendix: Description of Efficiency Calculations based on EKK

To study the relationship between EITC reforms and efficiency, we use the framework in Eissa, Kleven, and Kreiner (2008). EKK show the marginal deadweight burden of tax reform is given by the effect on government revenue from behavioral responses, where the behavioral revenue effect is related to the two different margins of labor supply response. The first effect captures the revenue effect from the change in the optimal hours of work for those who are working. The second effect captures the effect on revenue brought about by the tax-induced change in labor force participation. While the second effect on efficiency is related to the tax rate on labor force participation, the efficiency effect from changed working hours depends on the tax burden on the last dollar earned.

In particular, our welfare analysis uses expression in equation 23 of EKK:

$$\frac{\partial EB / \partial \theta}{\sum_{i=1}^{N} w_i \tilde{h}_i P_i(\tilde{q}_i)} = \sum_{i=1}^{N} \left[\frac{m_i}{1-m_i} \frac{\partial m_i}{\partial \theta} \varepsilon_i + \frac{a_i}{1-a_i} \frac{\partial a_i}{\partial \theta} \eta_i \right] s_i$$

In this expression, w is the wage, h is hours, m is the marginal tax rate, a is the average tax rate, ε is the hours elasticity, η is the participation elasticity, θ is the reform, and s is the wage share for individual i.

As in EKK, we focus our analysis on single mothers with children. This simplifies the analysis considerably because of the existence of only one potential worker. While we do not claim that it provides a comprehensive calculation of the efficiency benefits of the EITC, it does represent results for the largest group of recipients—representing about three-quarters of the total tax cost of the EITC.

The data for this exercise come from the 2005 March Current Population (CPS) Surveys. The March CPS is an annual demographic file of nearly 60,000 households, with information on labor market and income outcomes for the previous year. Consistent with the rest of the paper, the data we use are for tax year 2004.

The simulation procedure consists of several steps. First, we estimate the likelihood of labor market participation and earnings for each individual in a baseline year (usually the year prior to the tax change). For nonparticipants, the imputation of earnings is necessary to calculate labor income and tax liability if they choose to enter following a reform. To be consistent, we use imputed earnings for workers as well. The imputation of earnings is based on a simple log earnings regression, specified as:

$$\log(y_i) = X_i \alpha + \hat{P}_i \beta + v_i$$

where y is earned income (for the sample of workers), and X represents demographic characteristics, including age, education, age-education interactions, race, state of residence, and family size. To control for the self-selection of workers, we include a propensity score---the predicted probability of employment $\hat{P}_i$ as a regressor in the earnings equation. This probability of employment is estimated from a first-stage probit:

$$P(\text{lfp}_i = 1) = \Phi(Z_i \gamma)$$

where lfp is labor force participation and Z includes all demographic characteristics, including family size

and the number of preschool children. We therefore identify the selection effect using the number of preschool children.

We use predicted earnings to simulate individual marginal and average tax rates (pre-reform levels), as well as changes in federal tax rates implied by the reforms. Our marginal and average tax rates incorporate federal taxes, state taxes, payroll taxes, and taxes through the benefit system. The benefit system is particularly important for single mothers with children. We use TAXSIM for the all tax calculations. To simulate welfare benefits, we create a benefit calculator that includes the major programs of the welfare system (cash assistance, food stamps, and Medicaid). Our benefit calculator accounts for the main features of these programs, including the income-dependent reduction rates, state, and number of dependent children. We assign benefits using the empirical take-up rate of 54 percent (Moffitt 1992).

Figure 1
2007 EITC Schedule by Earnings, Number of Qualifying Children and Filing Status
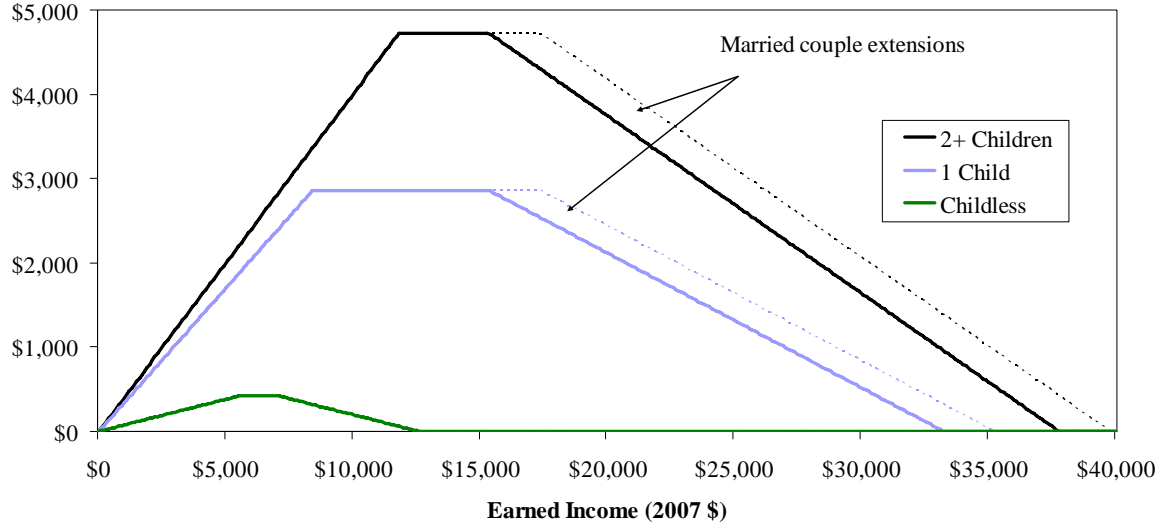
Figure 2
Changes in the EITC Schedule over Time, by number of children

(a) One Child

Legend:
- 2007 [After OBRA93]
- 1993 [After OBRA90]
- 1988 [After TRA84]
- 1984 [Before TRA86]

Y-axis: Credit Amount ($2007)
X-axis: Earned Income ($2007)

(b) Two or more children

Legend:
- 2007 [After OBRA93]
- 1993 [After OBRA90]
- 1988 [After TRA84]
- 1984 [Before TRA86]

Y-axis: Credit Amount ($2007)
X-axis: Earned Income ($2007)

33
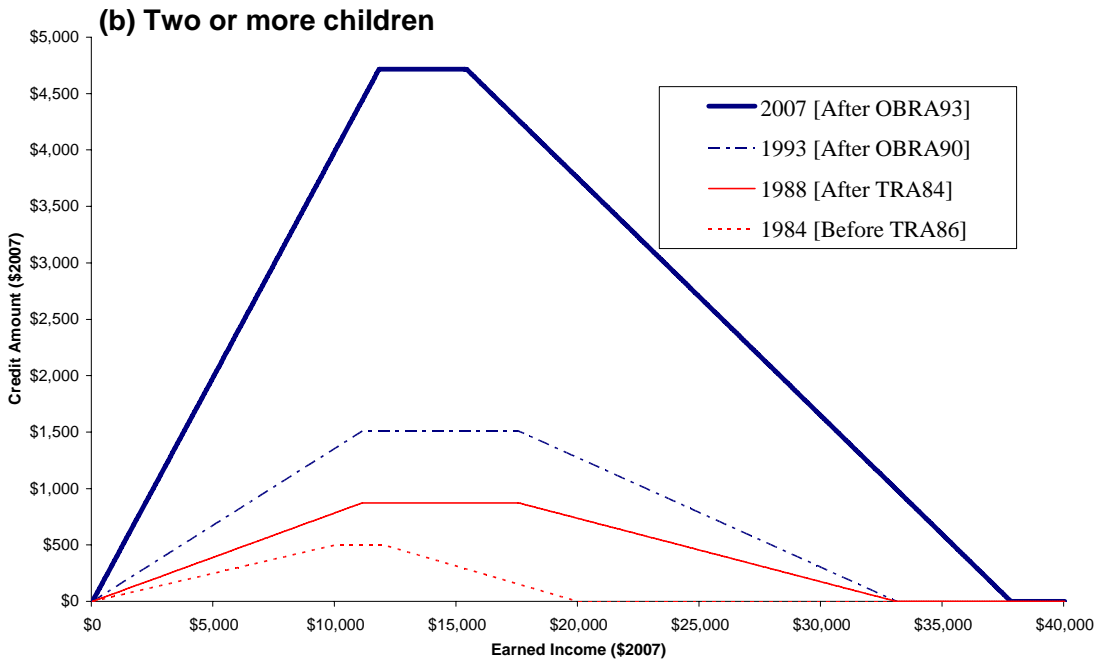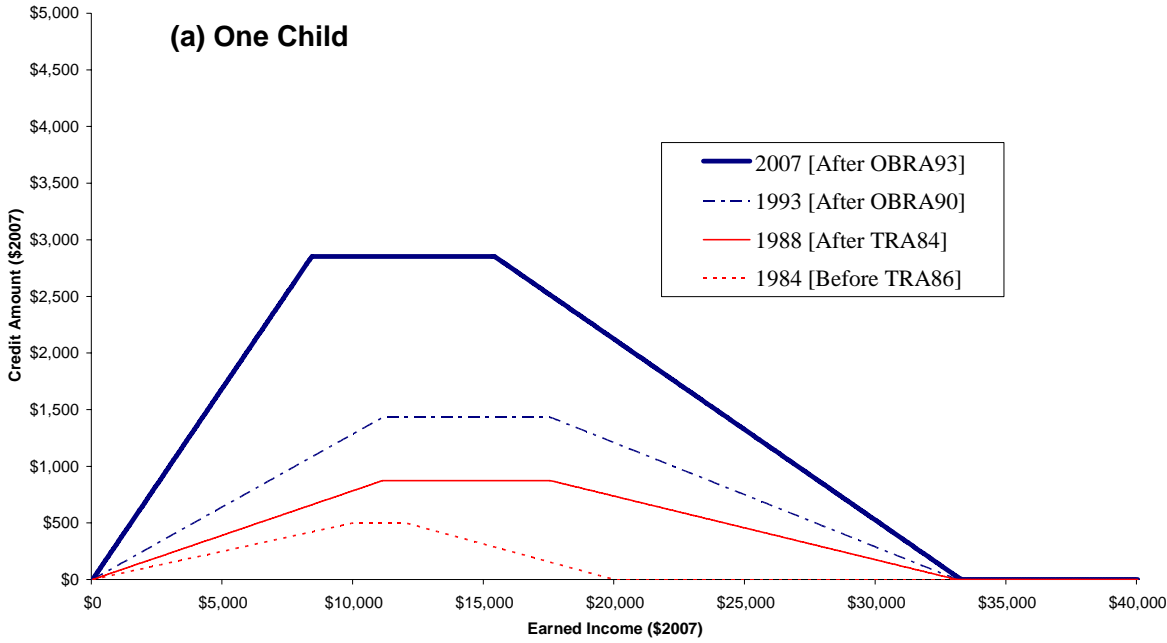
Figure 3
EITC Pure Tax Expenditure, Outlay and Total Tax Cost 1975-2004
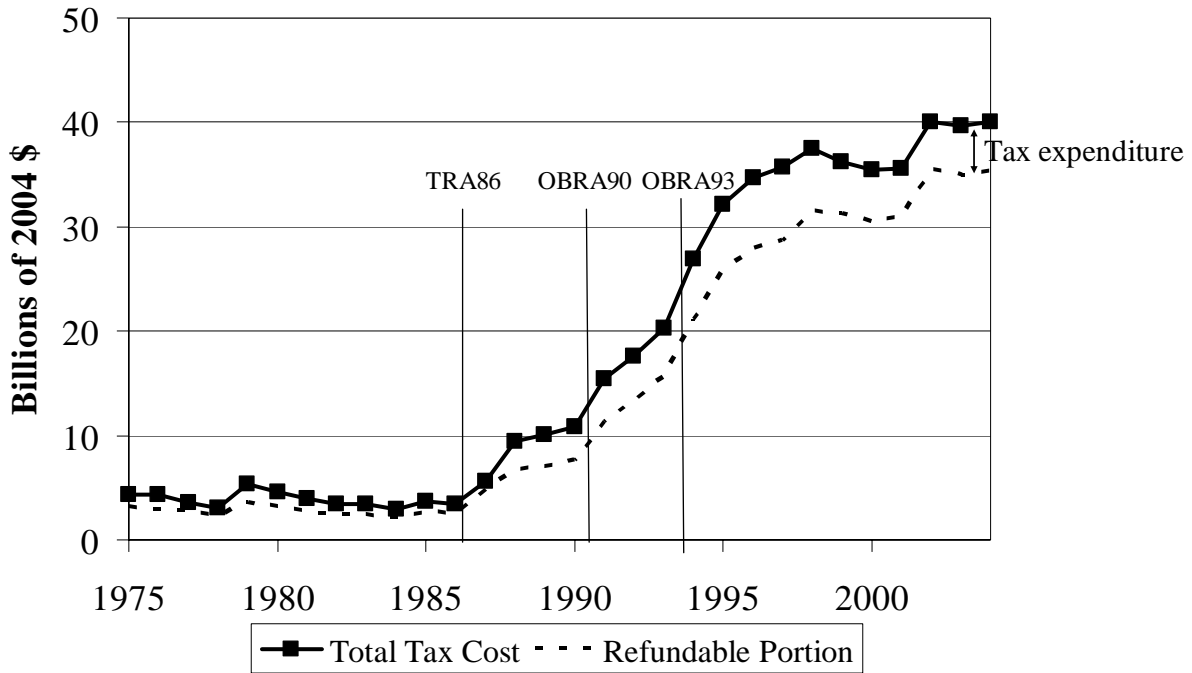
Figure 4
EITC Recipients 1975-2004
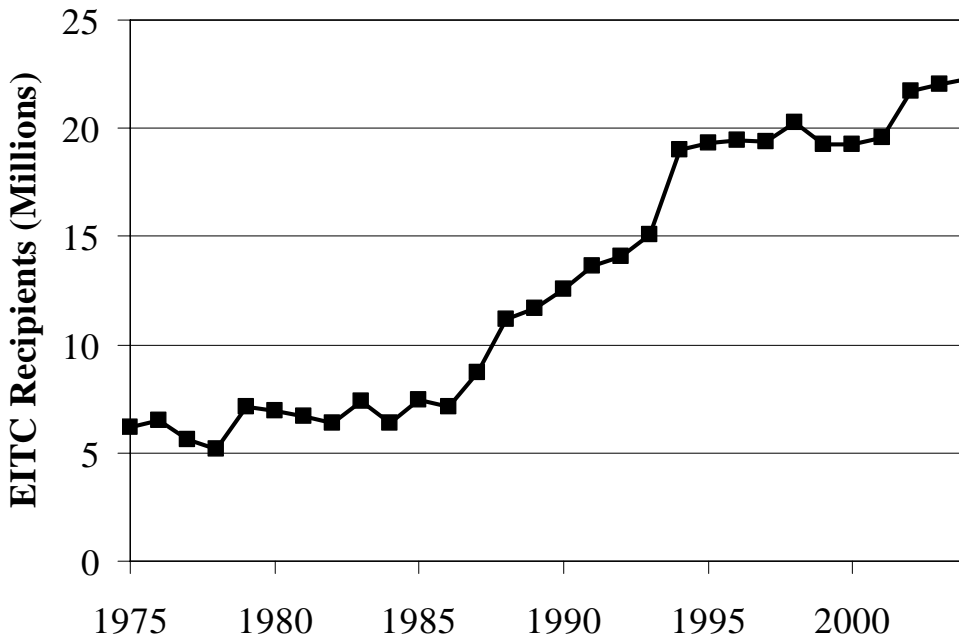
Source: 1975-2001, 2004 Green Book, Table 13-14. For 2002-2004 SOI tables from IRS. (check)

Figure 5: Percent of EITC Total Tax Cost and EITC Recipients by Cash Income Decile, 2004

(A) Unadjusted Cash Income Deciles
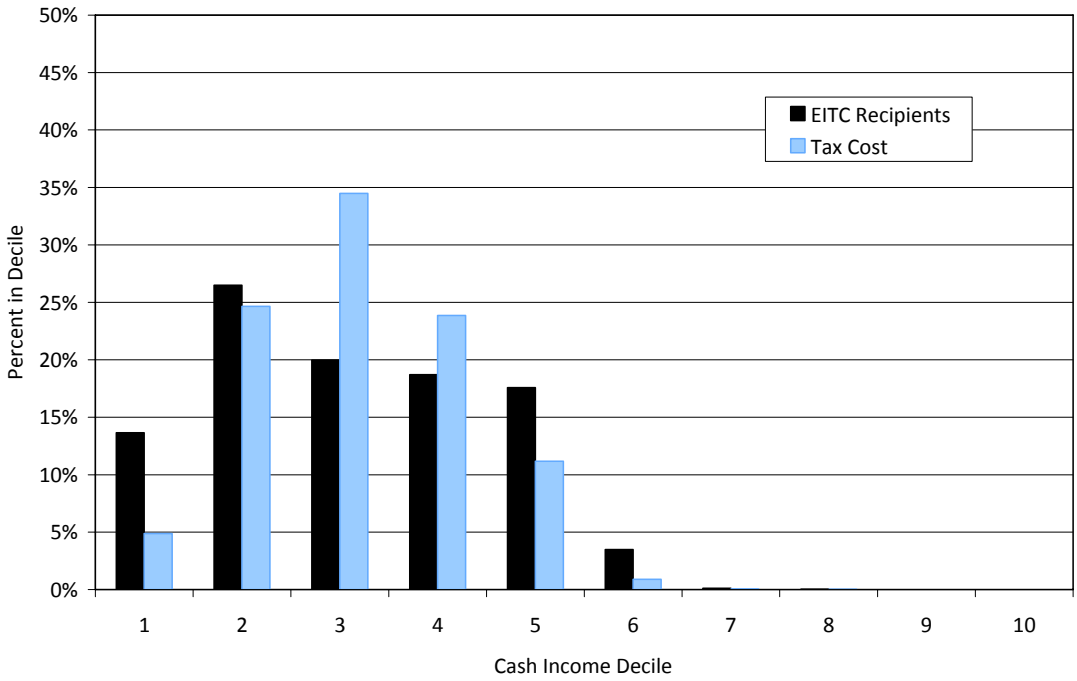
(B) Declines using Family Size Adjusted Cash Income
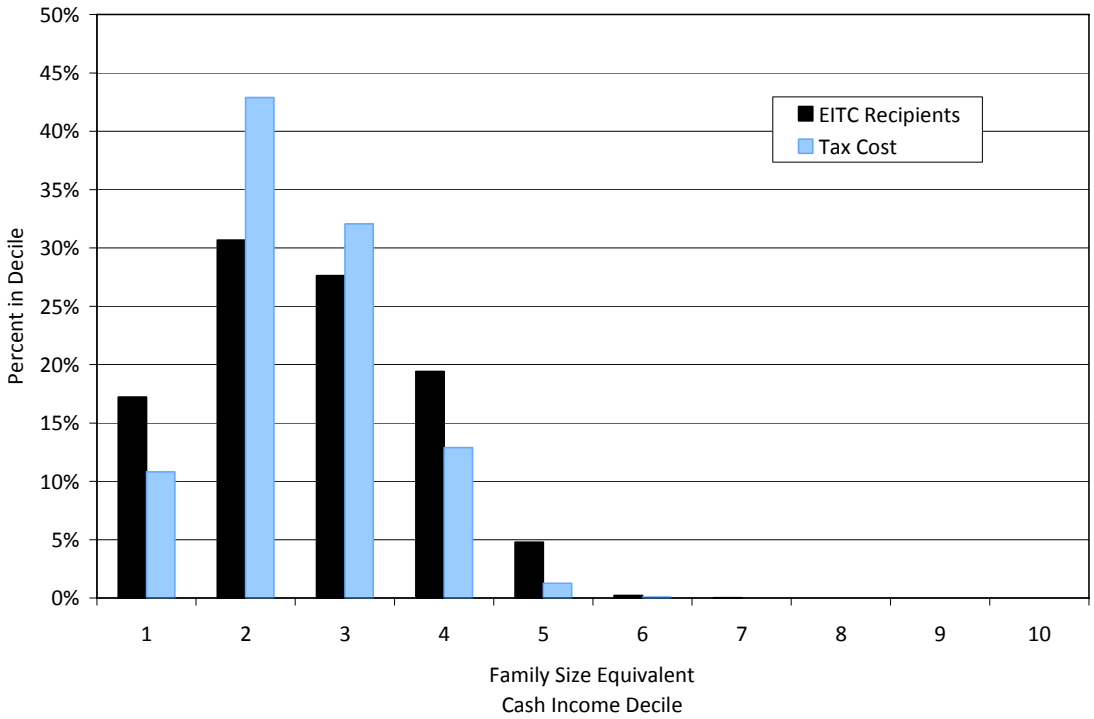
Source: Authors' tabulations of the 2004 SOI Public Use File.

Figure 6
Percent of EITC Total Tax Cost by Cash Income Decile, 1984-2004
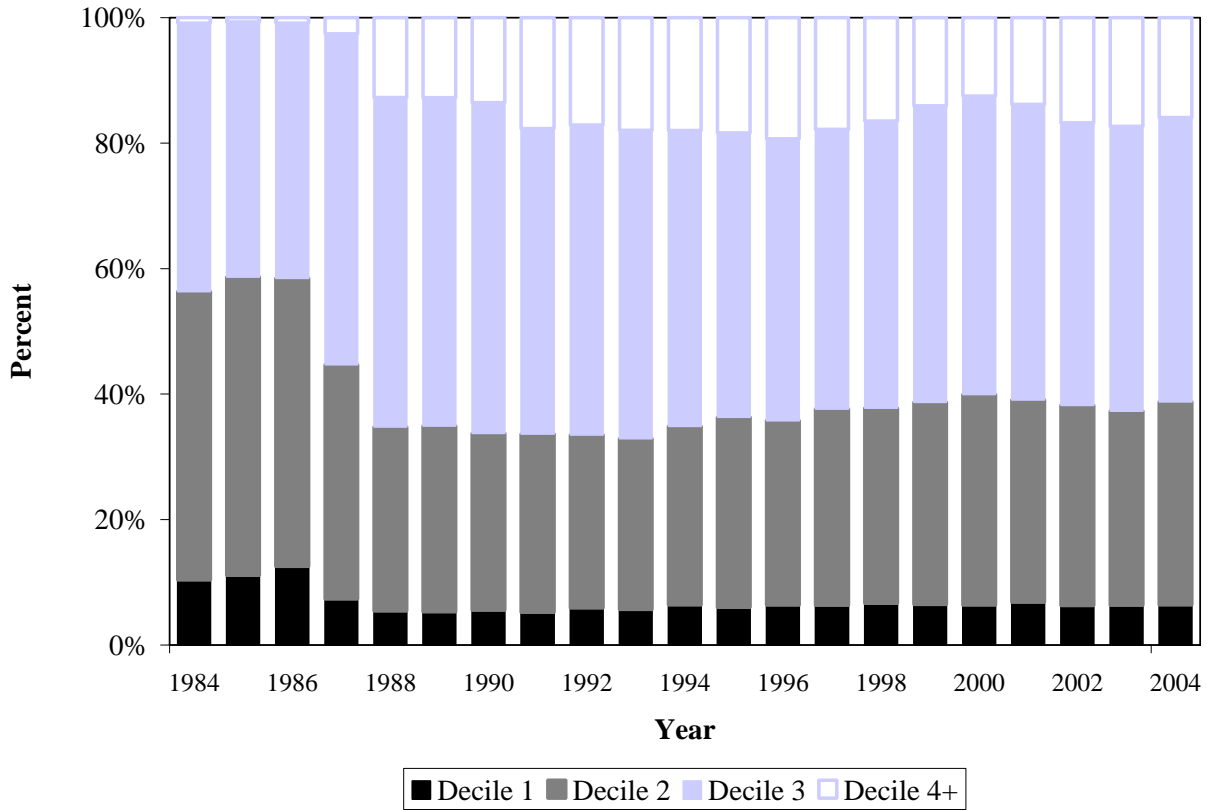
Source: Authors' tabulations of 2004 SOI Public Use File.

Figure 7
EITC Total Tax Cost per Income Tax Filer, by State in 2004

EITC Tax Cost per Filer, Lower 48 States
Source: 2004 SOI Public Use File

504 - 617
415 - 504
332 - 415
306 - 332
263 - 306
245 - 263
203 - 245
178 - 203
161 - 178
102 - 161
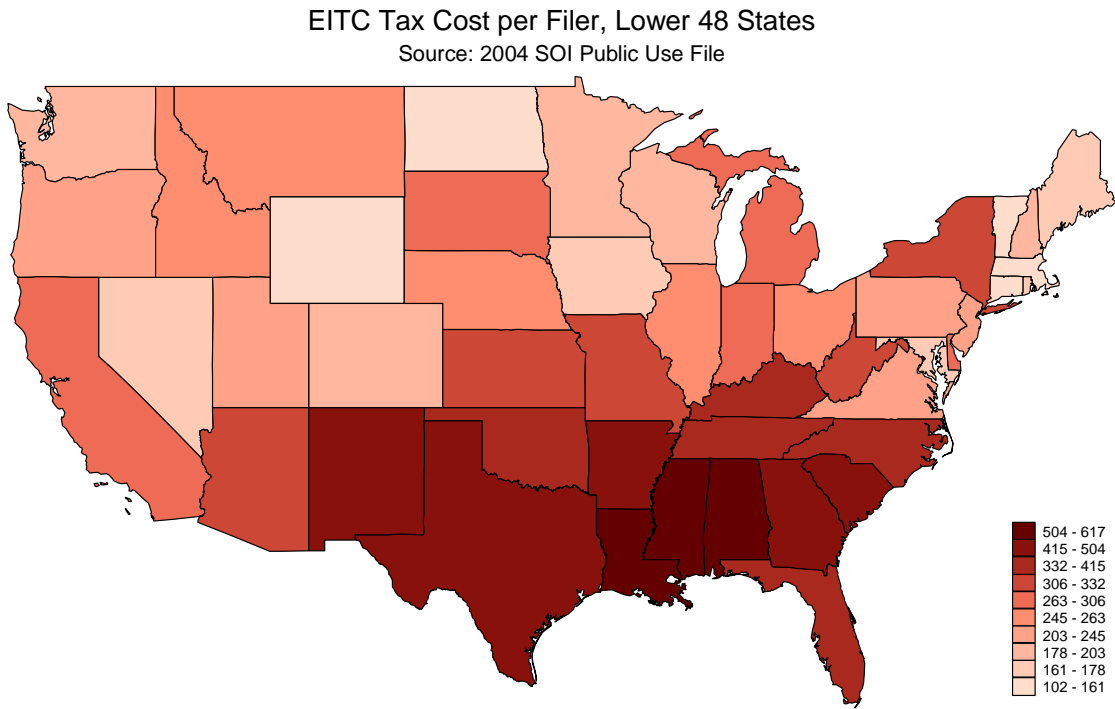
Source: Authors' tabulations of 2004 SOI Public Use File.

Figure 8
Stylized EITC Budget Constraint

After Tax
Income

D   *Phase-out*
         w(1-τ$_p$)

                        C   *Flat*
                                 w

         No EITC
         w   B

                                 Phase-in
                                 w(1+τ$_s$)

                                        A

                                 0

Hours of Work
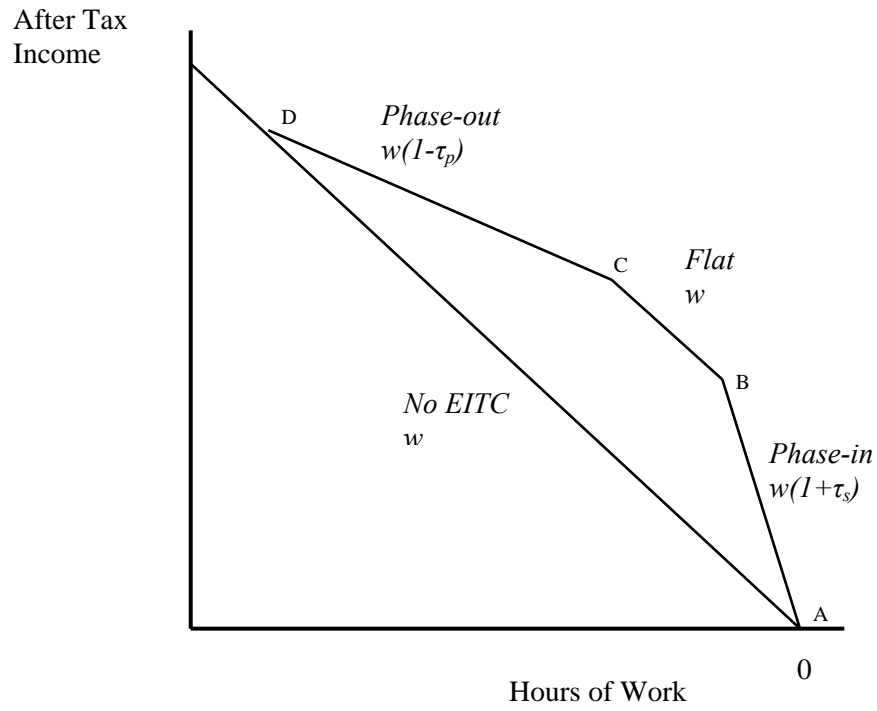
Figure 9
Marginal Tax Rates from 2004 Federal Income Tax
Single Filers with Two Children, No AMT or FICA
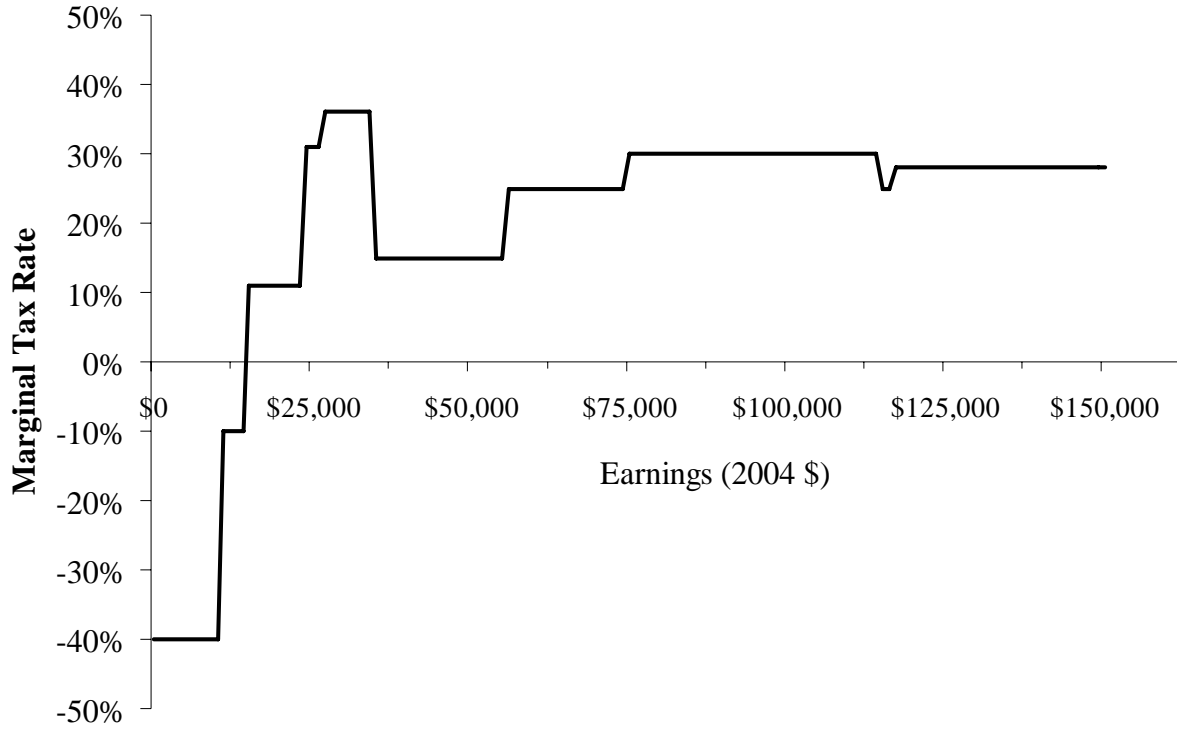
Source: Authors' tabulations. Tax calculations from TAXSIM.

Figure 10

Annual Employment Rate for Women by Marital Status and Presence of Children, 1983-2006
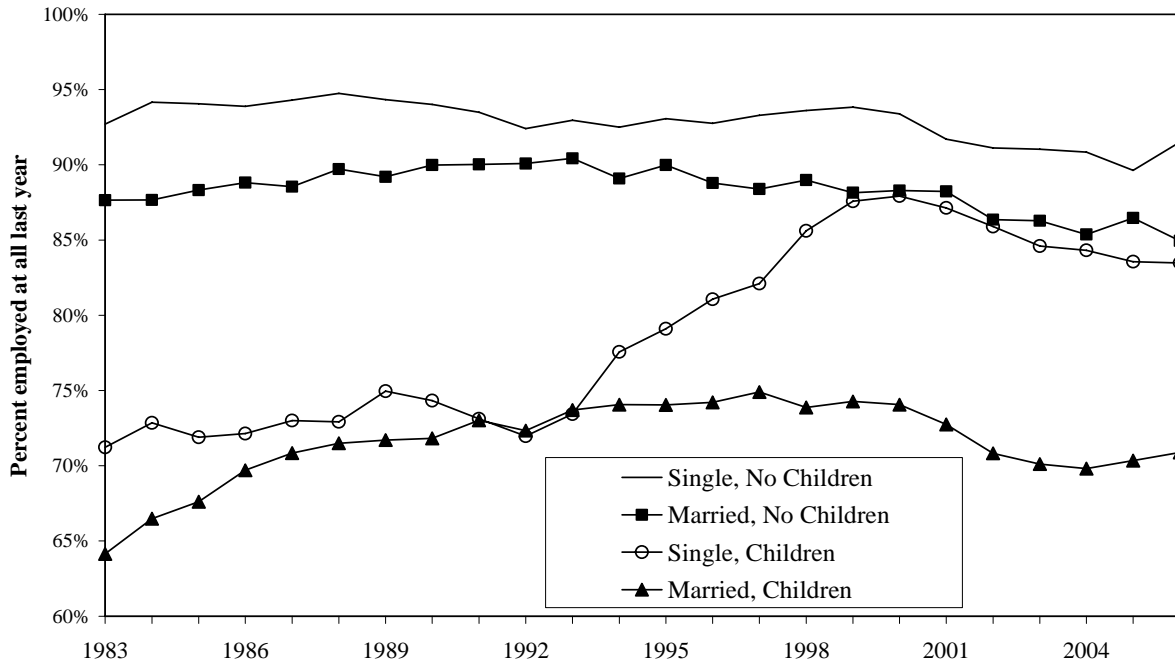
Source: Authors' tabulations of 1984–2007 March Current Population Surveys. The sample includes all women aged 19-44 who are not in school or disabled. We also drop the relatively small number of women who report working positive hours but have zero earnings or report positive earnings but zero hours. For these calculations, employment is defined by any work over the (prior) calendar year.

Figure 11
Expansionary EITC Reforms

(A) Increase Phase-in Rate
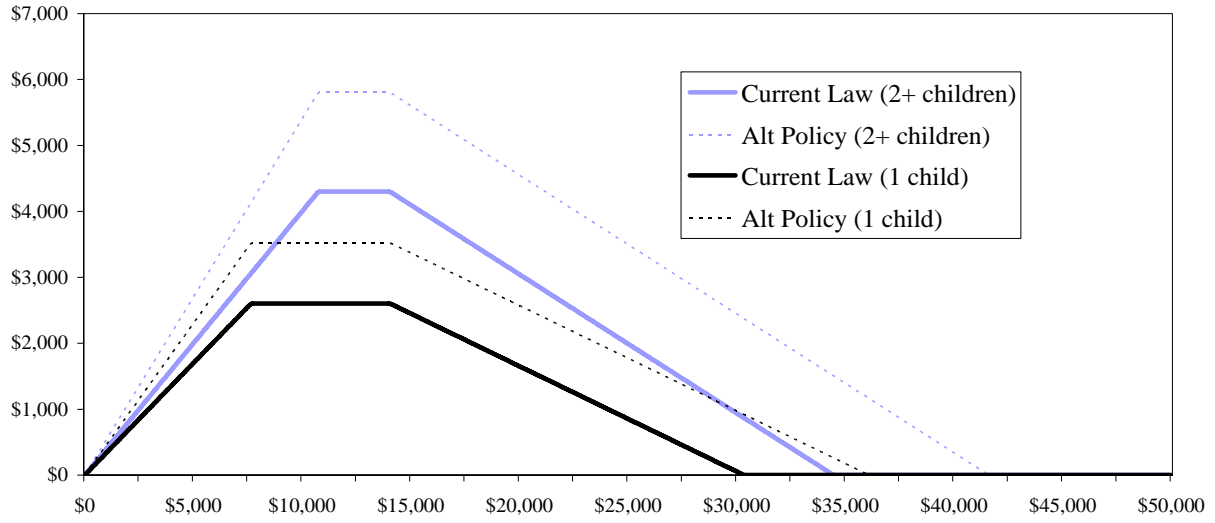
(B) Expand Childless Credit

Figure 12
EITC Reforms Increasing "Uniformity"

(A) Non-revenue neutral

(b) Revenue Neutral

Figure 13
EITC Reforms Increasing "Targeting"

(A) Non-revenue Neutral

(B) Revenue Neutral

Figure 14
Percent Distribution of EITC Total Tax Cost, under current law and revenue neutral reforms

Source: Authors' tabulations of 2004 SOI Public Use Tax Data and TAXSIM.

Table 1: Historical EITC Parameters (current year dollars)

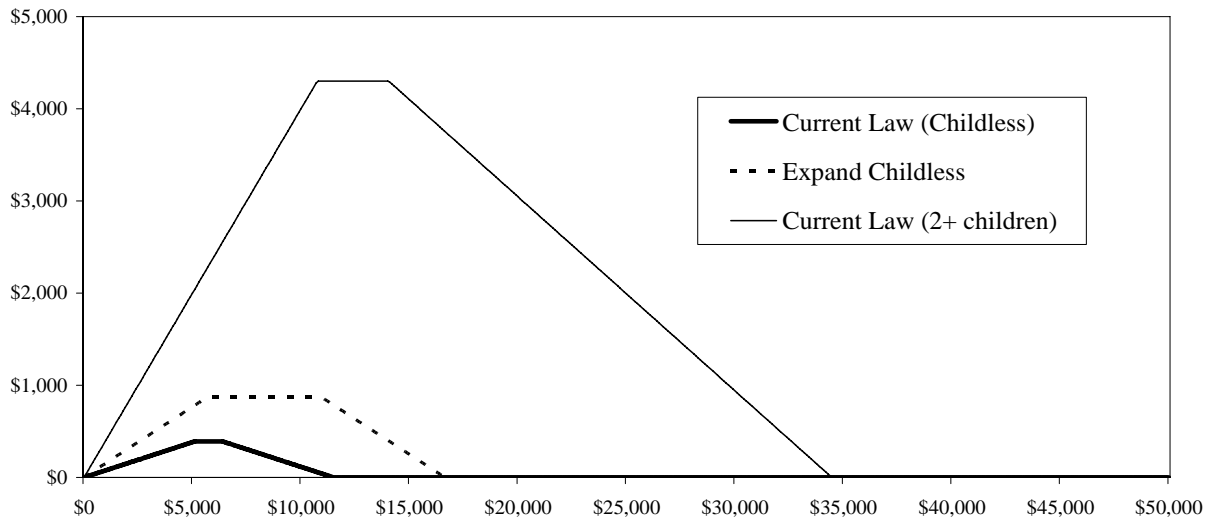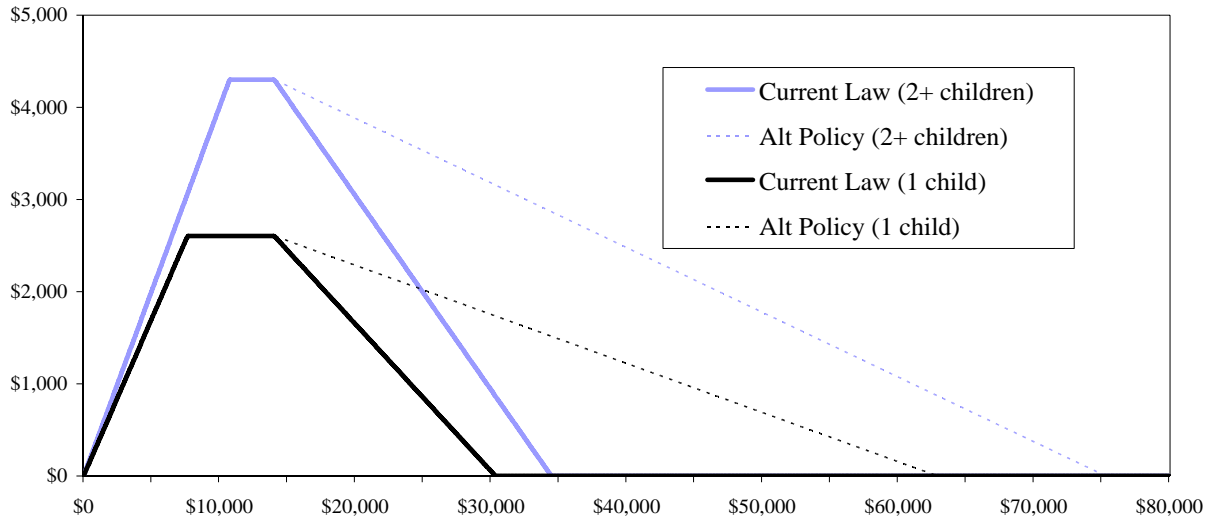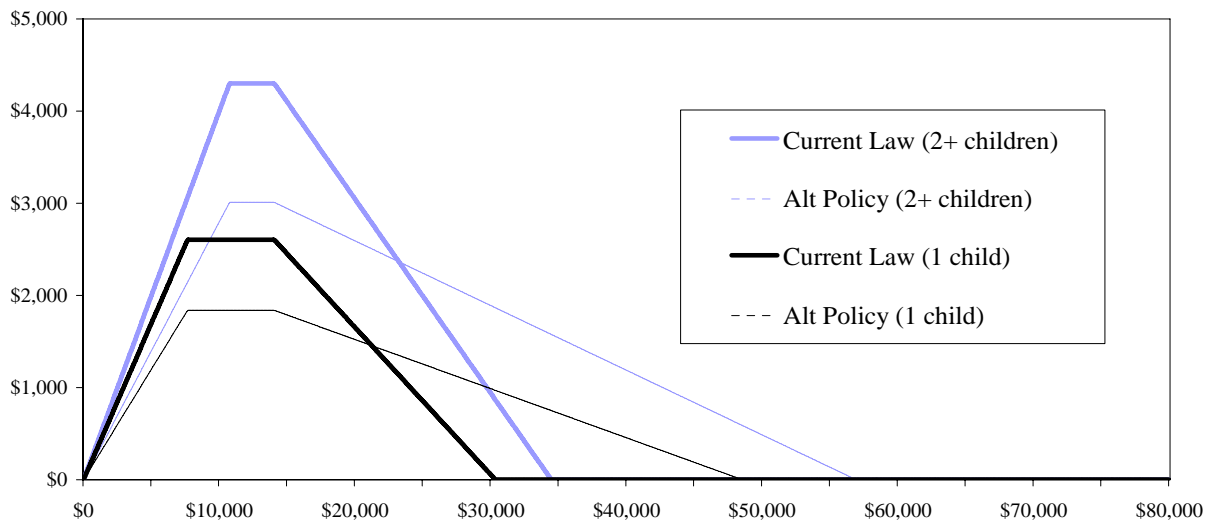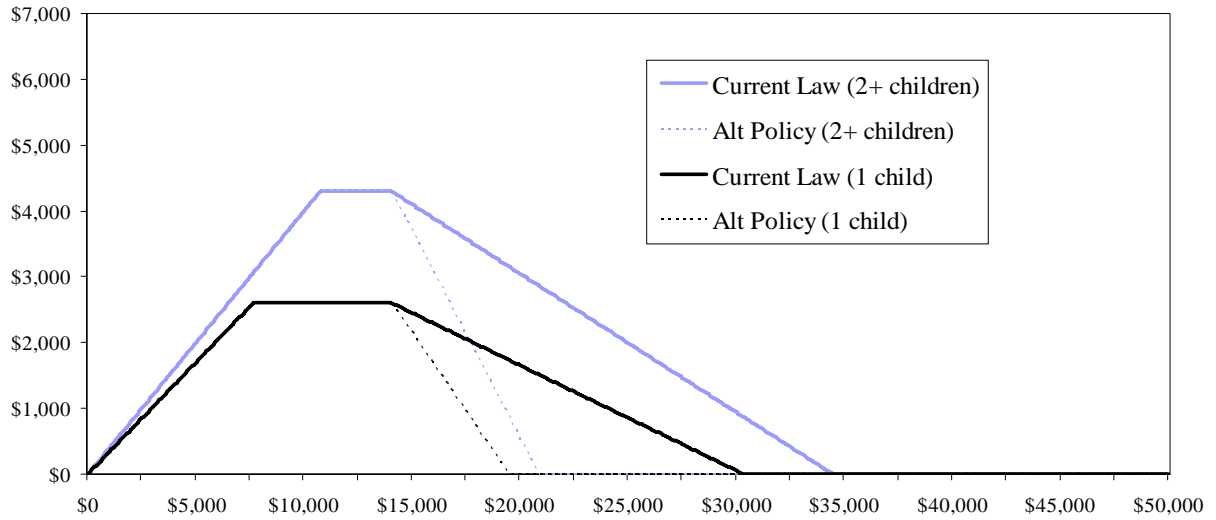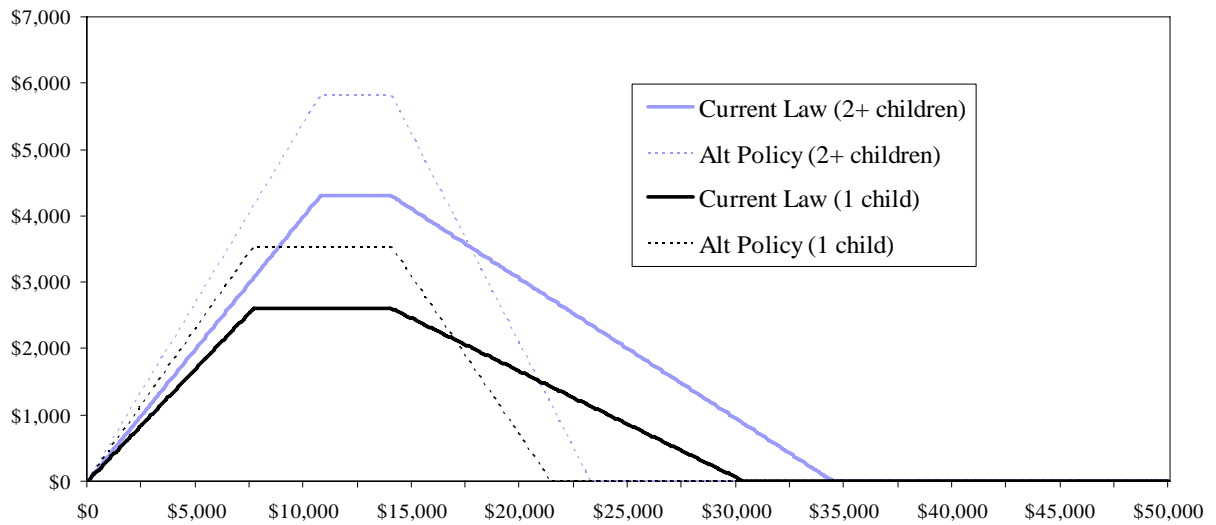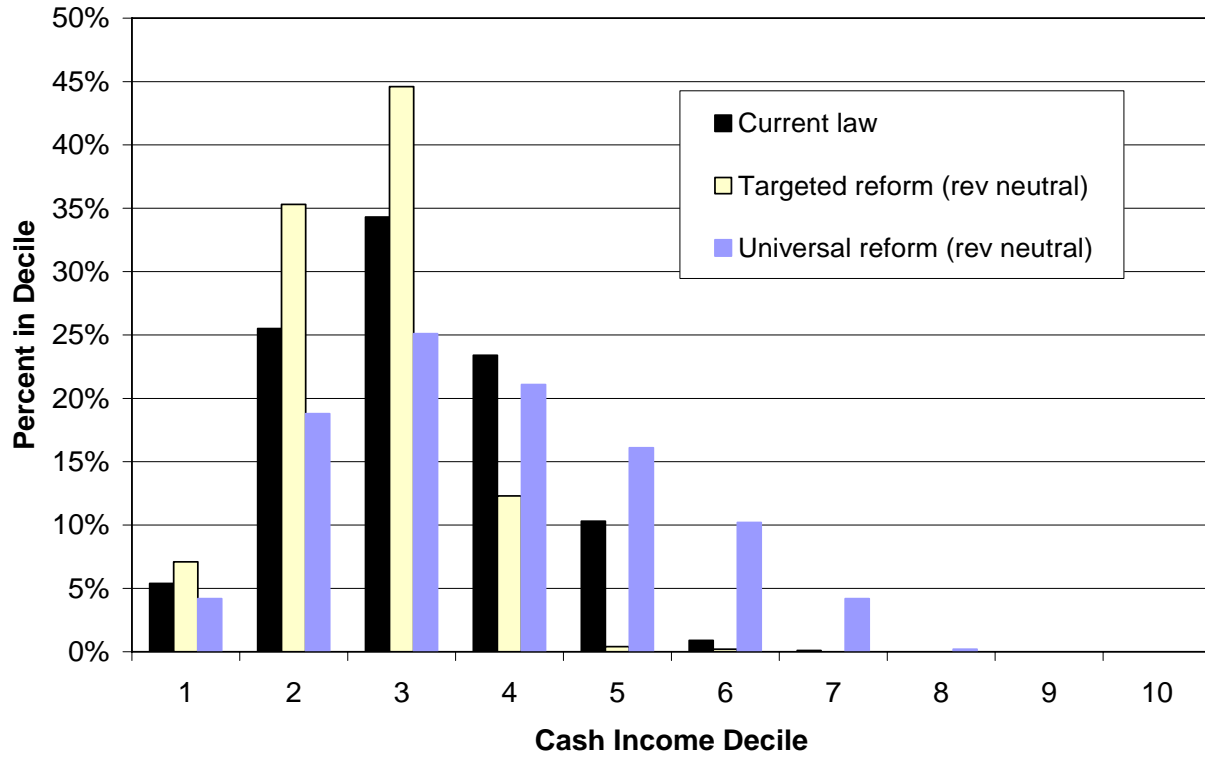| Tax year		Phase-in rate	Minimum income for max credit	Maximum Credit	Phase-out rate	Phaseout range Beginning Income	Ending Income
1975–78		10	4,000	400	10	4,000	8,000
1979–84		10	5,000	500	12.5	6,000	10,000
1985–86		14	5,000	550	12.22	6,500	11,000
1987		14	6,080	851	10	6,920	15,432
1988		14	6,240	874	10	9,840	18,576
1989		14	6,500	910	10	10,240	19,340
1990		14	6,810	953	10	10,730	20,264
1991	One child	16.7	7,140	1,192	11.93	11,250	21,250
	Two children	17.3	7,140	1,235	12.36	11,250	21,250
1992	One child	17.6	7,520	1,324	12.57	11,840	22,370
	Two children	18.4	7,520	1,384	13.14	11,840	22,370
1993	One child	18.5	7,750	1,434	13.21	12,200	23,050
	Two children	19.5	7,750	1,511	13.93	12,200	23,050
1994	No children	7.65	4,000	306	7.65	5,000	9,000
	One child	26.3	7,750	2,038	15.98	11,000	23,755
	Two children	30	8,425	2,528	17.68	11,000	25,296
1995	No children	7.65	4,100	314	7.65	5,130	9,230
	One child	34	6,160	2,094	15.98	11,290	24,396
	Two children	36	8,640	3,110	20.22	11,290	26,673
1996	No children	7.65	4,220	323	7.65	5,280	9,500
	One child	34	6,330	2,152	15.98	11,610	25,078
	Two children	40	8,890	3,556	21.06	11,610	28,495
1997	No children	7.65	4,340	332	7.65	5,430	9,770
	One child	34	6,500	2,210	15.98	11,930	25,750
	Two children	40	9,140	3,656	21.06	11,930	29,290
1998	No children	7.65	4,460	341	7.65	5,570	10,030
	One child	34	6,680	2,271	15.98	12,260	26,473
	Two children	40	9,390	3,756	21.06	12,260	30,095
1999	No children	7.65	4,530	347	7.65	5,670	10,200
	One child	34	6,800	2,312	15.98	12,460	26,928
	Two children	40	9,540	3,816	21.06	12,460	30,580
2000	No children	7.65	4,610	353	7.65	5,770	10,380
	One child	34	6,920	2,353	15.98	12,690	27,413
	Two children	40	9,720	3,888	21.06	12,690	31,152
2001	No children	7.65	4,760	364	7.65	5,950	10,710
	One child	34	7,140	2,428	15.98	13,090	28,281
	Two children	40	10,020	4,008	21.06	13,090	32,121
2002	No children	7.65	4,910	376	7.65	6,150	11,060
	One child	34	7,370	2,506	15.98	13,520	29,201
	Two children	40	10,350	4,140	21.06	13,520	33,178
2003	No children	7.65	4,990	382	7.65	6,240	11,230
	One child	34	7,490	2,547	15.98	13,730	29,666
	Two children	40	10,510	4,204	21.06	13,730	33,692
2004	No children	7.65	5,100	390	7.65	6,390	11,490
	One child	34	7,660	2,604	15.98	14,040	30,338
	Two children	40	10,750	4,300	21.06	14,040	34,458
2005	No children	7.65	5,220	399	7.65	6,530	11,750
	One child	34	7,830	2,662	15.98	14,370	31,030
	Two children	40	11,000	4,400	21.06	14,370	35,263
2006	No children	7.65	5,380	412	7.65	6,740	12,120
	One child	34	8,080	2,747	15.98	14,810	32,001
	Two children	40	11,340	4,536	21.06	14,810	36,348
2007	No children	7.65	5,590	428	7.65	7,000	12,590
	One child	34	8,390	2,853	15.98	15,390	33,241
	Two children	40	11,790	4,716	21.06	15,390	37,783

Source: Tax Policy Center, http://www.taxpolicycenter.org/taxfacts/Content/PDF/historical_eitc_parameters.pdf.
Note: The values of the beginning and ending points of the phase-out range were increased for married taxpayers filing jointly by $1,000 in 2002-2004 and $2,000 in 2005-2007.

Table 2
EITC Distributional Analysis under 2004 Tax Law

	EITC Recipients		Total Tax Cost		
	Number (millions)	% of total	Amount (billions)	% of total	Average payment per recipient
All	22.1		$40.1		$1,806
Number of EITC Qualifying Children					
1 child	8.4	38%	$14.4	36%	$1,715
2+ children	9.2	42%	$24.7	62%	$2,693
No Children	4.6	21%	$1.0	3%	$218
Filing Status					
Head of Household	11.7	53%	$26.1	65%	$2,230
Joint Return	5.1	23%	$10.0	25%	$1,953
Single	5.3	24%	$3.9	10%	$742
EITC Range					
Phase In	5.9	27%	$9.1	23%	$1,544
Flat	4.2	19%	$11.7	29%	$2,817
Phase Out	12.1	54%	$19.2	48%	$1,595

Source: Authors tabulations of 2004 SOI Public Use File.

Table 3
EITC Distributional Analysis by Cash Income Deciles

	All Tax Filers (millions)	EITC Recipients (millions)	EITC Tax Cost (Billions)	Cash Income (Billions)	Percent distribution, EITC recipients	Percent distribution, EITC tax cost	Tax cost per EITC recipient	Tax cost per tax filer	Tax cost as % of cash income
All	130.9	22.1	$40.1	$7,099.3	100.0%	100.0%	$1,811	$306	0.6%
Cash Income Decile									
0-10% (excluding negative)	11.9	3.0	$2.0	$33.0	13.6%	4.9%	$647	$165	5.9%
10-20%	13.2	5.9	$9.9	$108.9	26.5%	24.6%	$1,685	$747	9.1%
20-30%	13.2	4.4	$13.8	$186.5	20.0%	34.5%	$3,127	$1,047	7.4%
30-40%	13.2	4.1	$9.6	$267.4	18.7%	23.9%	$2,309	$723	3.6%
40-50%	13.2	3.9	$4.5	$364.3	17.6%	11.2%	$1,151	$339	1.2%
50-60%	13.2	0.8	$0.4	$480.1	3.5%	0.9%	$463	$27	0.1%
60-70%	13.2	0.0	$0.0	$622.6	0.1%	0.1%	$884	$2	0.0%
70-80%	13.2	0.0	$0.0	$810.5	0.0%	0.0%	$1,860	$0	0.0%
80-90%	13.2	0.0	$0.0	$1,100.6	0.0%	0.0%	$481	$0	0.0%
90-100%	13.2	0.0	$0.0	$3,125.5	0.0%	0.0%	$0	$0	0.0%
Cash Income Bracket									
Less than 0	0.0	0.0	$0.0	$0.0	0.0%	0.0%	$0	$0	0.0%
0-2500	5.1	1.0	$0.3	$6.7	0.8%	0.8%	$331	$64	4.9%
2500-5000	6.0	1.8	$1.4	$22.4	3.4%	3.4%	$764	$229	6.1%
5000-7500	5.6	2.1	$2.8	$34.9	6.9%	6.9%	$1,328	$495	7.9%
7500-1000	5.8	2.7	$4.6	$50.7	11.5%	11.5%	$1,726	$793	9.1%
10000-12500	5.5	2.5	$6.0	$62.3	15.0%	15.0%	$2,417	$1,084	9.6%
12500-15000	5.6	1.8	$5.9	$76.6	14.8%	14.8%	$3,308	$1,067	7.8%
15000-17500	5.6	1.7	$5.4	$90.1	13.4%	13.4%	$3,090	$968	6.0%
17500-20000	5.5	1.6	$4.1	$102.5	10.1%	10.1%	$2,576	$744	4.0%
20000-22500	4.9	1.7	$3.6	$104.5	8.9%	8.9%	$2,158	$729	3.4%
22500-25000	4.5	1.5	$2.6	$105.7	6.4%	6.4%	$1,698	$576	2.4%
25000-27500	4.1	1.3	$1.7	$107.9	4.3%	4.3%	$1,271	$415	1.6%
27500-30000	3.9	1.2	$1.0	$112.5	2.5%	2.5%	$861	$260	0.9%
30000-32500	4.0	0.7	$0.5	$124.5	1.2%	1.2%	$706	$120	0.4%
32500+	64.8	0.6	$0.3	$6,098.2	0.7%	0.7%	$452	$4	0.0%

Source: Authors' tabulations of 2004 SOI Public Use File.

Table 4
EITC Parameters under Alternative Simulations

EITC Policy Reform Parameters

Number of Children	Phase-In Rate	Maximum income for phase-in ($)	Maximum Credit ($)	Phase-Out Begin ($)	Phase-Out Rate	End of Phase-Out Region ($)
Panel A: 2004 Law						
0	0.08	5,100	390	6,390	0.0765	11,490
1	0.34	7,660	2,604	14,040	0.1598	30,338
2+	0.40	10,750	4,300	14,040	0.2106	34,458
Panel B: Expansionary Reforms						
Increase phase-in rate						
1	0.46	7,660	3,487	14,040	0.1598	35,861
2+	0.54	10,750	5,754	14,040	0.2106	41,362
Expand EITC for childless adults						
0	0.153	5,720	780	10,900	0.1530	15,998
Panel C:Universal Reforms						
Non revenue neutral						
1	0.34	7,660	2,604	14,040	0.0533	62,896
2+	0.40	10,750	4,300	14,040	0.0702	75,294
Revenue Neutral						
1	0.24	7,660	1,811	14,040	0.0533	48,017
2+	0.28	10,750	2,988	14,040	0.0702	56,604
Panel D :Targeted Reforms						
Non revenue neutral						
1	0.34	7,660	2,604	14,040	0.4794	19,472
2+	0.40	10,750	4,300	14,040	0.6318	20,846
Revenue Neutral						
1	0.46	7,660	3,487	14,040	0.4794	21,314
2+	0.54	10,750	5,754	14,040	0.6318	23,147
Panel E: Moderate Reforms						
Phaseout Rate Cut(1 percentage point)						
1	0.34	7,660	2,604	14,040	0.1498	31,423
2+	0.40	10,750	4,300	14,040	0.2006	35,476
Phaseout Rate Increase (1 percentage point)						
1	0.34	7,660	2,604	14,040	0.1698	29,376
2+	0.40	10,750	4,300	14,040	0.2206	33,532
Panel F: Moderate Reforms						
Subsidy Rate Cut(1 percentage point)						
1	0.33	7,660	2,528	14,040	0.1598	29,859
2+	0.39	10,750	4,193	14,040	0.2106	33,947
Subsidy Rate Increase (1 percentage point)						
1	0.35	7,660	2,681	14,040	0.1598	30,817
2+	0.41	10,750	4,408	14,040	0.2106	34,968

Table 5: Distributional Implications of Major Reforms

	Panel A:	Panel B: Expansionary Reforms		Panel C: Universal		Panel D: Targeted	
	Current Law (recalculation)	Increase phase-in	Expand to Childless	Non revenue neutral	Revenue neutral	Non revenue neutral	Revenue neutral
Number of EITC Recipients (millions)	22.9	25.4	26.2	35.5	30.2	16.1	17.5
Total Tax Cost (billions)	$40.1	$60.0	$42.9	$67.1	$39.1	$26.5	$38.4

Percent Distribution of Total Tax Cost by

Number of EITC Qualifying Children

1 child	34.0%	34.2%	31.8%	33.1%	33.3%	35.0%	35.0%
2+ children	54.2%	55.3%	50.8%	58.8%	56.4%	52.1%	50.7%
No Children	11.8%	10.5%	17.4%	8.1%	10.2%	12.9%	14.2%
Marital Status							
Head of Household	65.2%	65.4%	61.2%	56.7%	60.8%	66.7%	67.4%
Joint Return	24.8%	25.8%	23.9%	36.6%	30.7%	19.9%	20.6%
Single	10.0%	8.8%	14.9%	6.7%	8.5%	13.4%	12.0%
EITC Range							
None	5.5%	5.5%	3.1%	4.6%	5.0%	4.6%	4.9%
Phase In	19.9%	17.8%	20.3%	12.0%	14.7%	30.0%	27.6%
Flat	25.1%	22.5%	29.6%	15.2%	18.2%	37.5%	34.6%
Phase Out	49.4%	52.1%	43.1%	45.8%	50.3%	27.9%	32.8%
Cash Income Decile							
0-10%	6.6%	5.7%	7.4%	4.0%	5.2%	9.9%	8.8%
10-20%	27.1%	24.1%	28.6%	16.3%	19.9%	40.9%	37.5%
20-30%	33.2%	30.1%	32.8%	20.7%	24.5%	43.6%	42.4%
30-40%	22.7%	22.9%	21.4%	18.7%	20.9%	5.1%	10.7%
40-50%	9.4%	13.3%	8.9%	15.3%	15.5%	0.4%	0.4%
50-60%	0.8%	3.6%	0.8%	12.0%	9.9%	0.2%	0.2%
60-70%	0.1%	0.2%	0.1%	8.8%	4.0%	0.0%	0.0%
70-80%	0.0%	0.0%	0.0%	4.0%	0.2%	0.0%	0.0%
80-90%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
90-100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Authors' tabulations of the 2004 SOI Public Use File.
Note: EITC ranges for income are constructed using adjusted gross income and defined separately for each reform. In some cases, therefore, the tax rate can change due to changes in the composition of the group (as well as due to policy changes for those remaining in the group). "Current law" is not the actual tax cost but our recalculation using TAXSIM assuming a 100 percent take-up rate in the EITC.

Table 6
Average and Marginal Tax Rates under Current Law and Changes with EITC Reform

| | Tax Rates under Current Law | Change In Tax Rates: (Alternative Simulation - Current Law) | | | | | |
| | | Expansionary Reforms | | Universal | | Targeted | |
		Increase phase-in	Expand to Childless	Non revenue neutral	Revenue neutral	Non revenue neutral	Revenue neutral
Average Tax Rate by							
Marital Status							
Head of Household	-10.2%	-4.7	-0.1	-2.4	2.2	2.0	-1.7
Joint Return	4.7%	-0.5	0.0	-0.7	0.1	0.4	0.1
Single	4.6%	-0.2	-0.6	0.0	0.2	0.1	-0.1
EITC Range							
Not eligible	7.6%	-0.1	0.1	-0.1	0.0	0.1	0.0
Phase In	-10.1%	-3.0	-1.5	0.0	2.6	0.0	-3.0
Flat	-15.5%	-4.9	-1.1	-0.1	4.4	0.2	-4.7
Phase Out	-6.6%	-2.6	-0.2	-2.0	0.5	1.9	0.5
Newly eligible (phase-out)		-1.3	-0.7	-2.6	-1.5	-	-
Newly ineligible (phase-out)		-	-	-	-	4.3	3.2
Cash Income Decile							
0-10%	-4.9%	-1.4	-1.2	-0.6	1.0	0.0	-1.4
10-20%	-8.5%	-3.2	-1.3	-0.1	2.7	0.0	-3.1
20-30%	-6.3%	-2.5	-0.4	-0.2	2.1	0.9	-1.6
30-40%	-1.7%	-1.7	0.0	-1.2	0.4	2.9	1.8
40-50%	2.4%	-1.2	0.0	-1.8	-0.6	1.1	1.1
50-60%	5.0%	-0.4	0.0	-1.6	-0.7	0.1	0.1
60-70%	6.5%	0.0	0.0	-1.0	-0.3	0.0	0.0
70-80%	7.9%	0.0	0.0	-0.3	0.0	0.0	0.0
80-90%	9.5%	0.0	0.0	-0.1	0.0	0.0	0.0
90-100%	14.8%	0.0	0.0	0.0	0.0	0.0	0.0
Marginal Tax Rate by							
Marital Status							
Head of Household	7.5%	-0.5	0.1	-3.1	-1.8	1.2	2.4
Joint Return	16.8%	0.4	0.0	0.3	-0.1	-0.1	0.2
Single	12.1%	-0.1	0.3	-0.1	0.0	0.1	0.0
EITC Range							
Not eligible	18.0%	0.0	0.0	-0.2	-0.1	0.0	0.1
Phase In	-8.8%	-2.6	-0.9	0.0	2.7	0.1	-2.5
Flat	-4.9%	-0.2	-0.7	0.0	0.8	2.1	1.3
Phase Out	12.9%	0.1	0.3	-5.7	-5.6	8.7	11.0
Newly eligible (phase-out)		14.8	5.6	5.8	5.5	-	-
Newly ineligible (phase-out)		-	-	-	-	-15.3	-14.9
Cash Income Decile							
0-10%	-4.0%	-1.4	-1.0	0.0	1.2	0.0	-1.4
10-20%	-1.1%	-1.7	-0.4	-0.1	2.0	0.1	-1.7
20-30%	5.3%	0.1	3.2	-2.1	-2.0	6.9	6.9
30-40%	13.7%	0.0	0.0	-4.0	-3.9	0.8	6.6
40-50%	16.8%	0.5	0.1	-3.2	-3.2	-5.0	-4.9
50-60%	16.4%	2.9	0.1	0.9	0.9	-0.9	-0.8
60-70%	18.6%	0.2	0.0	2.0	1.6	-0.1	-0.1
70-80%	18.8%	0.0	0.0	2.0	0.2	0.0	0.0
80-90%	21.3%	0.0	0.0	0.3	0.0	-0.1	-0.1
90-100%	28.4%	0.0	0.0	0.0	0.0	0.0	0.0

Source: Authors' tabulations of the 2004 SOI Public Use File.
Note: EITC ranges for income are constructed using adjusted gross income and defined separately for each reform. In some cases, therefore, the tax rate can change due to changes in the composition of the group (as well as due to policy changes for those remaining in the group). "Current law" is not the actual tax cost but our recalculation using TAXSIM assuming a 100 percent take-up rate in the EITC.

Table 7a

Impacts of Marginal EITC Changes on Incentives at the Intensive and Extensive Margins

	Population (millions)	Participation Tax Rate	Change in Participation tax rate	Marginal Tax Rate	Change in Marginal tax rate
A. Marginal Reform 1: 2004 EITC with lower phase-out rate					
Total Eligible for EITC	13.268	0.268	-0.002	0.288	-0.003
By EITC Region					
Phase In	2.421	0.164	0.000	0.023	0.000
Flat	2.783	0.169	0.000	0.187	0.000
Phase Out	7.852	0.331	-0.003	0.405	-0.007
Newly *Eligible*	0.212	0.401	-0.002	0.323	0.107
B. Marginal Reform 2: 2004 EITC with higher phase-out rate					
Overall Eligibles	12.817	0.270	0.002	0.293	0.002
By EITC Region					
Phase In	2.421	0.164	0.000	0.023	0.000
Flat	2.783	0.169	0.000	0.187	0.000
Phase Out	7.613	0.329	0.003	0.404	0.008
Newly *In*eligible	0.24	0.394	0.002	0.442	-0.113
C. Marginal Reform 3: 2004 EITC with lower subsidy rate					
Total Eligible for EITC	12.938	0.268	0.006	0.290	0.0002
By EITC Region					
Phase In	2.421	0.164	0.009	0.023	0.009
Flat	2.783	0.169	0.007	0.187	0.000
Phase Out	7.734	0.330	0.004	0.405	-0.001
Newly *In*eligible	0.118	0.398	0.001	0.434	-0.103
D. Marginal Reform 4: 2004 EITC with higher subsidy rate					
Overall Eligibles	13.174	0.267	-0.006	0.288	0.000
By EITC Region					
Phase In	2.421	0.164	-0.009	0.023	-0.009
Flat	2.783	0.169	-0.007	0.187	0.000
Phase Out	7.852	0.331	-0.004	0.405	0.001
Newly Eligible	0.118	0.400	-0.001	0.317	0.099

Source: Authors' tabulations of the 2005 March CPS.
Notes: EITC regions assigned under current law EITC parameters. Participation and marginal tax rates are means under current law. Difference is alternative policy minus current law.

Table 7b
Welfare Effects of Phase-out Rate Changes on Single Parents

	Elasticity Composition	Efficiency gains			Traditional (4)	Welfare gain per Dollar Revenue (5)
		Intensive (1)	Extensive (2)	Total (3)		
A. Marginal Reform 1: 2004 EITC with lower phase-out rate						
Low	$\varepsilon=0, \eta=0.2$	0.000	0.019	0.019	0.043	1.120
Middle	$\varepsilon=0.1, \eta=0.3$	0.022	0.029	0.050	0.086	1.391
High	$\varepsilon=0.2, \eta=0.4$	0.043	0.039	0.082	0.129	1.834
Middle [Reversed]	$\varepsilon=0.3, \eta=0.1$	0.065	0.010	0.074	0.086	1.706
B. Marginal Reform 2: 2004 EITC with higher phase-out rate						
Low	$\varepsilon=0, \eta=0.2$	0.000	-0.018	-0.018	0.100	1.118
Middle	$\varepsilon=0.1, \eta=0.3$	0.050	-0.026	0.023	0.199	0.877
High	$\varepsilon=0.2, \eta=0.4$	0.100	-0.035	0.064	0.299	0.721
Middle [Reversed]	$\varepsilon=0.3, \eta=0.1$	0.149	-0.009	0.140	0.199	0.542
C: Marginal Reform 3: 2004 EITC with lower subsidy rate						
Low	$\varepsilon=0, \eta=0.2$	0.000	-0.024	-0.024	0.129	1.080
Middle	$\varepsilon=0.1, \eta=0.3$	0.065	-0.035	0.029	0.258	0.916
High	$\varepsilon=0.2, \eta=0.4$	0.129	-0.047	0.082	0.388	0.796
Middle [Reversed]	$\varepsilon=0.3, \eta=0.1$	0.194	-0.012	0.182	0.258	0.637
D. Marginal Reform 4: 2004 EITC with higher subsidy rate						
Low	$\varepsilon=0, \eta=0.2$	0.000	0.024	0.024	-0.021	1.080
Middle	$\varepsilon=0.1, \eta=0.3$	-0.011	0.036	0.026	-0.043	1.086
High	$\varepsilon=0.2, \eta=0.4$	-0.021	0.049	0.027	-0.064	1.091
Middle [Reversed]	$\varepsilon=0.3, \eta=0.1$	-0.032	0.012	-0.020	-0.043	0.943

Source: Authors' tabulations of the 2005 March CPS.
Note: The participation elasticity is given by η and the compensated hours of work elasticity is given by ε. The welfare gain is measured in percentage of wage income. The total welfare gain is calculated as the sum of the intensive and extensive gains. The "traditional" welfare gain is calculated assuming that the total labor supply elasticity is entirely along the intensive margin. The welfare gain per dollar spent equals RTB/(RTB−EG) where EG is the efficiency gain and RTB is the reduction in tax burden.