

## REDISTRIBUTION AND TAX EXPENDITURES: THE EARNED INCOME TAX CREDIT

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*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 that 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 to the credit. Finally, we calculate the efficiency effects of marginal changes to EITC parameters.*

*Keywords: distribution of benefits, hypothetical reforms, efficiency effects, Earned Income Tax Credit*

*JEL Codes: H21, H24*

“...[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.” Edwin Amenta (1998, p. 948)

### I. 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 2008, about 25 million families

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benefited from the tax credit, at a total cost to the federal government of \$51 billion (Tax Policy Center, 2010). By comparison, combined state and federal spending for poor families in the Temporary Assistance for Needy Families (TANF) was \$28.1 billion in 2008 (U.S. Department of Health and Human Services, 2010).

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 provides only minimal support to the poorest families. On the other hand, it rewards work: 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 (Hotz and Scholz, 2003). Notably, the EITC removed almost 2.6 million children from poverty in 2005, more than any other government program (Sherman, 2009). These estimates reflect the intent of the 1993 EITC expansion to lift full-time workers earning the minimum wage out of poverty.

This paper evaluates tax expenditures to lower-income families through the Earned Income Tax Credit. We begin in Section II with a review of the design of the EITC and trace its growth over time, as well as the evidence on the behavioral responses to the program. Given that the EITC has become the main redistribution program at the Federal level in the United States, we then turn our focus to its distributional effects. In Section III, we use tax-return data to examine who gets the credit, and show the benefits extend well into the middle of the income distribution. We also examine the size of this tax expenditure by tax-filing status and by geographic region. Section IV evaluates the behavioral responses to the EITC. We briefly review the empirical evidence on labor supply responses, which are well known and documented. We note that the credit has been enormously successful at encouraging labor-market participation by single parents, and that the evidence, showing no meaningful distortions to hours worked by tax filers in the labor force, has implications for how we might redesign the program. Potential reforms to the credit are then considered in Sections V and VI. We use data from the Current Population Survey to evaluate the distributional effects of major expansions and contractions of the EITC (Section V) and then the efficiency effects of small reforms (Section VI). This analysis of the welfare effects of EITC reforms considers seriously the evidence on the composition of labor supply, and shows that ignoring the participation response can substantially bias the analysis. Section VII concludes.

## II. 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, or farm self-employment income. Further, the taxpayer must have adjusted gross income and earned income below a specified amount (in tax year 2010, the maximum allowable income for a single taxpayer with two or more children is \$40,363). 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.<sup>1</sup>

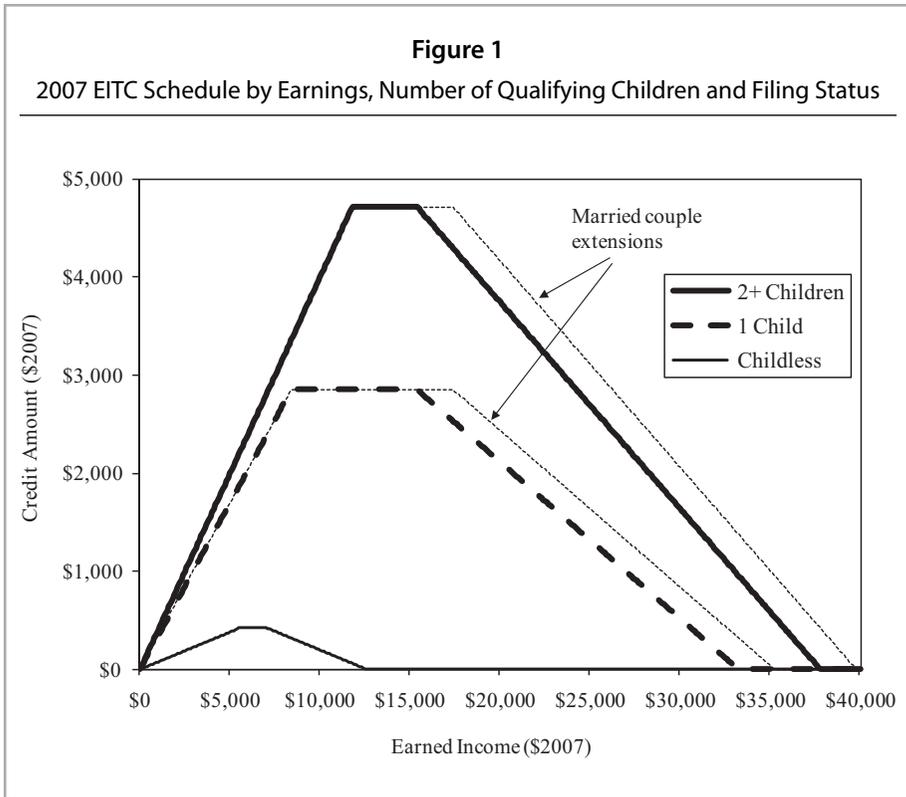
The *total tax cost* of the EITC consists of two components. The *pure tax expenditure* is the amount by which the EITC reduces the amount of taxes owed. Because the EITC is refundable, however, there is also the *outlay* component — taxpayers receive a tax refund when the EITC exceeds their taxes owed. The outlay component is large: in 2004 the total tax cost of the EITC was \$40 billion 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 consider the total tax cost (tax expenditure plus outlay) as the relevant object of study.

Each of the credit schedules (for no children, one child, and 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 2010, the subsidy rate of the EITC is 34 percent for taxpayers with one child, 40 percent for taxpayers with two 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 receives the maximum credit. In 2010, the maximum credit is \$3,050 for one child, \$5,036 for two children, and \$464 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 percent for one child, 21 percent for two or more children, and 7.65 percent for childless taxpayers). The flat and phase-out regions of the EITC are extended by about \$5,000 for married filers in 2010; this is the only aspect of the credit schedule that varies by filing status. Overall, the EITC schedule is traced out in Figure 1. This figure 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, 2009 median family income (most recent year available) was \$49,777 for all households and \$32,597 among female headed households (DeNavas-Walt, Proctor, and Smith, 2010).

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, both due to its income guarantee and its phase out. Ultimately the EITC was born out of a desire to reward work rather than provide a guaranteed income. Subsequently, the EITC was

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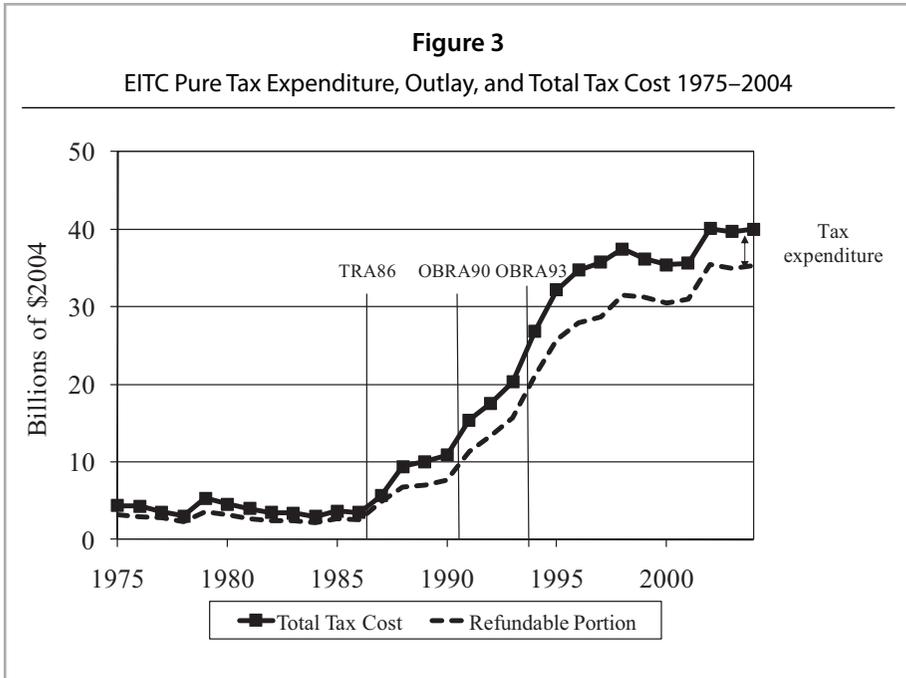
<sup>1</sup> A “qualifying child” for the EITC must be under age 19 (or 24 if a full-time student) or permanently disabled and residing with the taxpayer for more than half the year.



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 a relatively small 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 percent

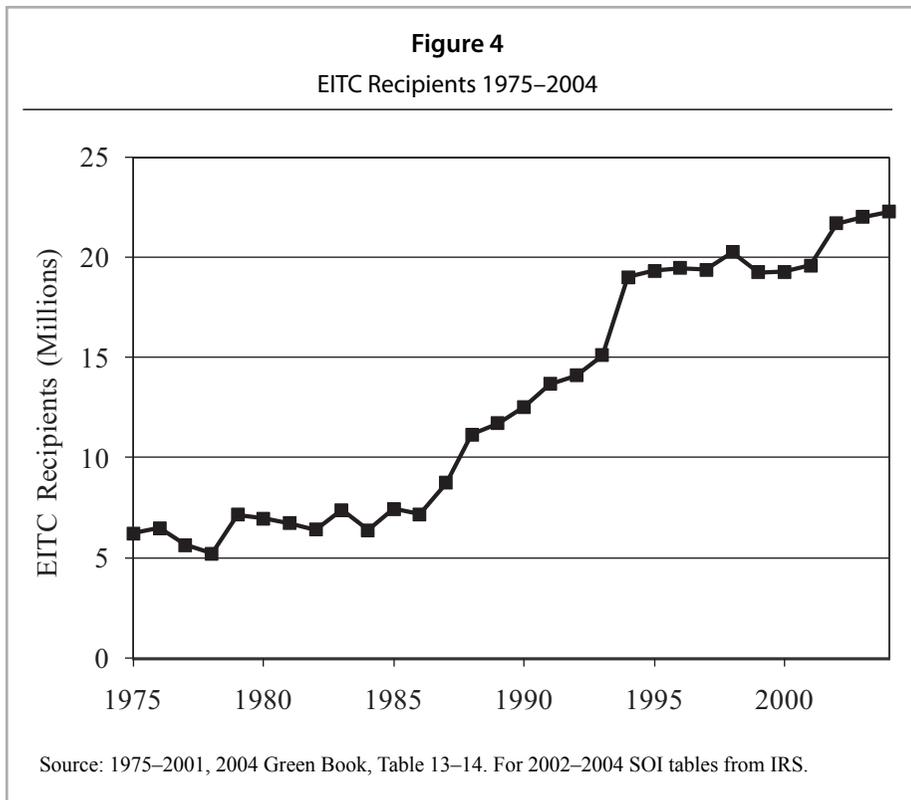




more than 10 years earlier.<sup>2</sup> Figure 3 also shows that the vast majority of the total tax cost — throughout the history of the EITC — derives from the refundable portion of the credit rather than the pure tax expenditure.

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 individuals (see also the discussion in Liebman (1998)). Indeed, administrative costs amount to an estimated 0.5 percent of EITC benefits (Internal Revenue Service, 2003). This compares to about 16 percent of the budget for traditional transfer programs (U.S. Congress House Ways and Means Committee, 2004). Further, there is likely to be 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 both

<sup>2</sup> At the same time as the federal EITC was expanding, many states introduced “add on” credits as part of their state income tax schedule. Currently, a total of 22 states and the District of Columbia have state EITCs, typically structuring their credits as a share of the federal credit, varying between 5 percent in Illinois to 40 percent in the District of Columbia (Williams, Johnson, and Shure 2009) The most recent cost data, from 2006, show states spent an estimated \$1.5 billion on the EITC (Okwuje and Johnson, 2006).



participation in the program and the well-being of those eligible for assistance. A disadvantage of administering benefits through the tax system is that the Internal Revenue Service (IRS) is not well suited to monitoring compliance with 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 some families.<sup>3</sup> Finally, the 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.

### III. WHO GETS THE EITC? DISTRIBUTIONAL ANALYSIS UNDER CURRENT LAW

In this section, we examine the distribution of the tax credit across income, demographic characteristics (family size, family type), and geography. This analysis is useful for assessing the success of the credit in reaching its intended beneficiaries. It also

<sup>3</sup> Although taxpayers can receive the credit as part of their monthly pay (through the “advance” option), only 3 percent of those eligible choose to do so. (Stamatiades, Cook, and Larson 2008).

serves as a baseline for evaluating the distributional effects of the various reforms we consider in the next section.

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. 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 22.1 million EITC recipients resulting in a total tax cost of \$40.1 billion. In Table 1, we show the distribution of recipients by the number of EITC qualified children, filing 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 total tax credits while those with one child receive 36 percent of this tax expenditure. Childless recipients represent 21 percent of all EITC recipients — numbering 4.7 mil-

**Table 1**  
EITC Distributional Analysis under 2004 Tax Law

	EITC Recipients		Total Tax Cost		Average Payment per Recipient (\$)
	Number (Millions)	Percentage of Total	Amount (\$Billions)	Percentage of Total	
All	22.1	100.0	40.1	100.0	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	55	19.2	48	1,595

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

lion in 2004 — but account for only 2 percent of the total tax cost. Table 1 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 distributions of credit dollars and recipients by EITC region — phase-in, flat, and phase-out — are also presented in Table 1. These distributions effectively determine the potential 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 are in the flat region of the EITC and account for 29 percent of the total tax cost, and fully 54 percent of recipients, accounting for 48 percent of the total tax cost, are in the phase-out region. The data therefore show that more than three-quarters of recipients have earnings in the flat and phase-out ranges, where the credit generates disincentives to work additional hours (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 shown in Table 1) 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 by examining the distribution of tax filers and EITC recipients by ranges and deciles of cash income in Table 2.<sup>4</sup> By design, the tax credit is concentrated at the bottom of the income distribution. About 35 percent of the tax expenditure goes to filers in the 3<sup>rd</sup> cash income decile (\$11,163–\$17,100 in 2004). About a quarter of the tax cost is in each of the 2<sup>nd</sup> and 4<sup>th</sup> cash income deciles (with income ranging from \$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 4<sup>th</sup> decile, and almost all of that is in the 5<sup>th</sup> decile.

We note that the EITC benefits are by no means exclusive to low-income families, reaching families well into the fifth decile of the income distribution (with incomes from \$23,570–\$31,650). Figure 5 shows the pattern of EITC expenditures across the income distribution. The top panel of the figure presents the distribution of EITC costs

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<sup>4</sup> Cash income is constructed as AGI less state and local tax refunds, plus deductions for IRA, student loan interest, alimony paid, tuition and 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).

**Table 2**  
EITC Distributional Analysis by Cash Income Deciles

	All Tax Filers (Millions)	EITC Recipients (Millions)	EITC Tax Cost (Billions \$)	Cash Income (Billions \$)	Percent		Tax Cost per Recipient (\$)	Tax Cost per Tax Filer (\$)	Tax Cost as Percent of Cash Income
					EITC Recipients (%)	Distribution, EITC Cost (%)			
All	130.9	22.1	40.1	7,099.3	100.0	100.0	1,811	306	0.6
Cash income decile									
0-10%	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

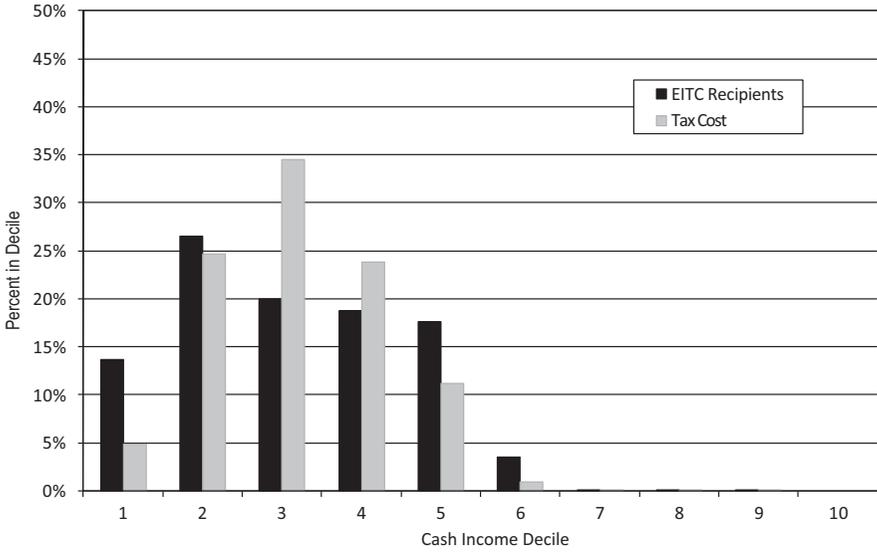
Cash income bracket	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Less than 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0-2,500	5.1	1.0	0.3	6.7	0.8	0.8	331	64	0.8	0.8	331	64	0.8	0.8	331	64	4.9
2,500-5,000	6.0	1.8	1.4	22.4	3.4	3.4	764	229	3.4	3.4	764	229	3.4	3.4	764	229	6.1
5,000-7,500	5.6	2.1	2.8	34.9	6.9	6.9	1,328	495	6.9	6.9	1,328	495	6.9	6.9	1,328	495	7.9
7,500-1,000	5.8	2.7	4.6	50.7	11.5	11.5	1,726	793	11.5	11.5	1,726	793	11.5	11.5	1,726	793	9.1
10,000-12,500	5.5	2.5	6.0	62.3	15.0	15.0	2,417	1,084	15.0	15.0	2,417	1,084	15.0	15.0	2,417	1,084	9.6
12,500-15,000	5.6	1.8	5.9	76.6	14.8	14.8	3,308	1,067	14.8	14.8	3,308	1,067	14.8	14.8	3,308	1,067	7.8
15,000-17,500	5.6	1.7	5.4	90.1	13.4	13.4	3,090	968	13.4	13.4	3,090	968	13.4	13.4	3,090	968	6.0
17,500-20,000	5.5	1.6	4.1	102.5	10.1	10.1	2,576	744	10.1	10.1	2,576	744	10.1	10.1	2,576	744	4.0
20,000-22,500	4.9	1.7	3.6	104.5	8.9	8.9	2,158	729	8.9	8.9	2,158	729	8.9	8.9	2,158	729	3.4
22,500-25,000	4.5	1.5	2.6	105.7	6.4	6.4	1,698	576	6.4	6.4	1,698	576	6.4	6.4	1,698	576	2.4
25,000-27,500	4.1	1.3	1.7	107.9	4.3	4.3	1,271	415	4.3	4.3	1,271	415	4.3	4.3	1,271	415	1.6
27,500-30,000	3.9	1.2	1.0	112.5	2.5	2.5	861	260	2.5	2.5	861	260	2.5	2.5	861	260	0.9
30,000-32,500	4.0	0.7	0.5	124.5	1.2	1.2	706	120	1.2	1.2	706	120	1.2	1.2	706	120	0.4
32,500+	64.8	0.6	0.3	6,098.2	0.7	0.7	452	4	0.7	0.7	452	4	0.7	0.7	452	4	0.0

Notes: The bottom cash income decile excludes tax units with negative cash income.  
 Source: Authors' tabulations of 2004 SOI Public Use File.

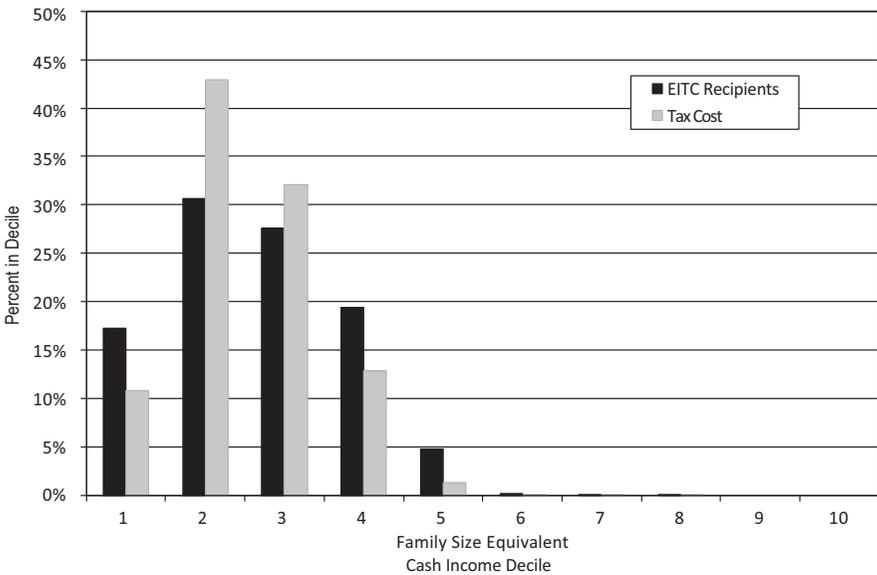
**Figure 5**

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

(A) Unadjusted Cash Income Deciles



(B) Deciles using Family Size Adjusted Cash Income



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

and recipients by income decile (consistent with Table 2). One issue that arises with this income distribution is that family size varies by income, which clouds the interpretation of the EITC's benefits. To adjust for family size, we use the Congressional Budget Office (CBO, 1997) procedure of dividing family income by the square root of family size. Panel B presents the distribution of benefits by this "family-size-equivalent" measure of income, and shows a similar distribution of EITC expenditures (tax cost), though somewhat more concentrated in the lowest deciles. Nearly three-quarters of all expenditures are in deciles two and three. For the remainder of the paper, we return to our original income deciles (unadjusted for family size).

#### IV. BEHAVIORAL EFFECTS OF THE EITC

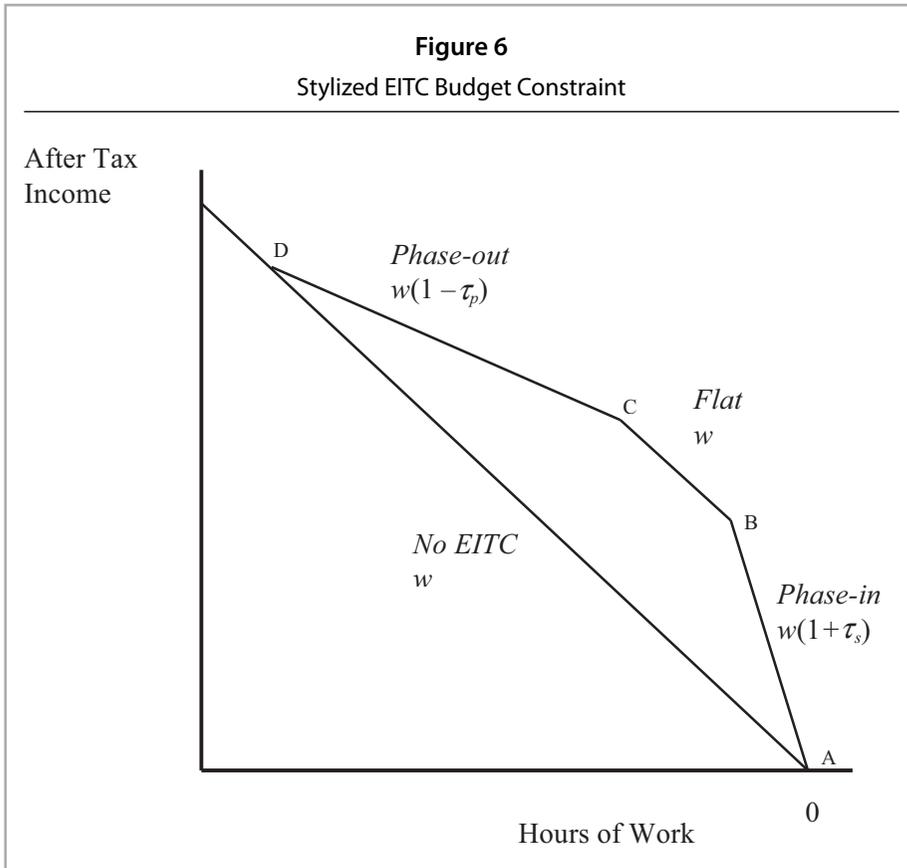
A primary motivation for recent expansions of the EITC is to reward the values of "work and family." In this section, we describe the work incentives created by the credit, and review the empirical evidence on the behavioral effects of the program.

##### A. Labor Supply Incentives

A key design feature of the EITC that distinguishes it from traditional income support programs is that it 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 (participation) and a reduction in the intensive margin (hours worked) of labor supply.

Consider first families with one parent or one potential earner. Figure 6 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  $\tau_s$  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  $\tau_p$  (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 income 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.

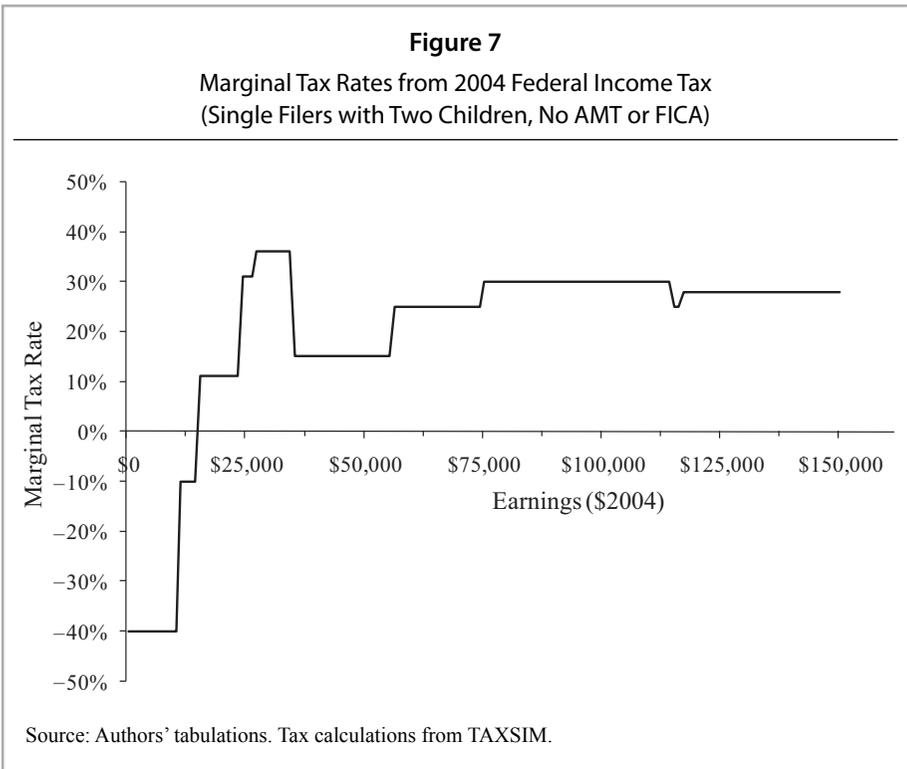


The impact of the EITC on the hours worked by a single working taxpayer, however, is generally expected to be negative but depends on which region of the credit the woman is in before the credit is expanded or introduced. If she is in the phase-in region, the EITC leads to an ambiguous impact on hours worked due to the negative income effect and positive substitution effect of the increase in the after tax wage due to the credit. 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 region, a negative substitution effect.<sup>5</sup> Given that most EITC recipients have income beyond the phase-in range (see Table 1), the expectation is that the EITC will *reduce* the number of hours worked by most eligible single taxpayers already in the labor force.

<sup>5</sup> 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.

These labor supply incentives are substantial. Eissa and Hoynes (2006) 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 an income 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 7. For these simulations, we assume that the family only has earned income and takes the standard deduction; the tax calculation ignores state income taxes, the alternative minimum tax (AMT), and the payroll tax. This figure shows that the marginal tax rates in the phase-out region are higher than those experienced by taxpayers at far greater earnings.

For married couples, the labor supply predictions are less clear. For primary earners in married couples, the EITC is expected to increase employment but reduce hours worked (as with single taxpayers). However, the EITC is expected to *reduce* the participation and hours worked of most secondary earners in eligible families (primarily women). This occurs because the credit is based on *family* earnings and



income. For example, suppose that the husband is the primary earner and his earnings place the family in the phase-out range. From the standpoint of the secondary earner, the EITC raises family after-tax income and reduces her net-of-tax wage — thereby, through negative income and substitution effects, leading unambiguously to a reduction in hours worked *and* participation. This situation describes all but the lowest income married couples, and therefore it is unlikely the EITC will have any positive effect on either the intensive or extensive margins of labor supply of married women.

## B. Empirical Evidence on Labor Supply

The empirical literature on the labor supply effects of the EITC, which mostly focuses on single mothers, reports results very much in line with the predictions discussed above.<sup>6</sup> The research on single mothers shows consistently that the EITC leads to significant increases in employment (extensive margin), suggesting highly responsive labor supply for this group. In contrast, there is little evidence that the EITC leads to a reduction in labor supply for those in the labor market (intensive margin). There are fewer studies on the incentive effects for married couples, but the available evidence finds that the EITC leads to small but statistically significant decreases in participation rates and hours worked.

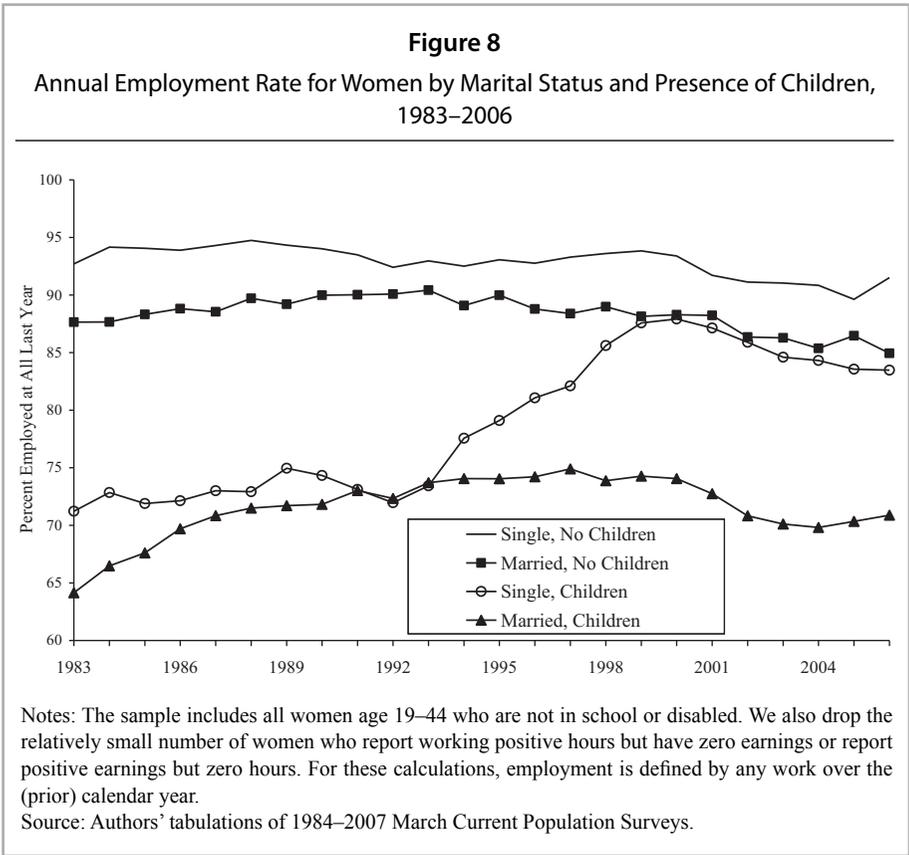
The finding for single mothers of a significant extensive margin effect but no intensive margin effect is consistent with the current consensus that intensive labor supply elasticities are relatively small. It might also be that EITC recipients are not fully aware of the structure of the EITC schedule (Chetty and Saez, 2009). These results have important implications for the welfare impacts of the EITC as well as its “optimal” design (discussed below).

To illustrate the findings from the quasi-experimental analyses of single mothers, Figure 8 presents annual employment rates for women by marital status and presence of children for 1983–2006.<sup>7</sup> 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 when 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 OBRA93. Over this same period, there was little change in employment rates of single women without children.

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<sup>6</sup> 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 (2006).

<sup>7</sup> 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.



**V. HYPOTHETICAL REFORMS TO THE EITC**

The EITC is generally considered a powerful tool for the government to offset the stagnation of wages at the bottom of the skill distribution. In fact, the American Recovery and Reinvestment Act passed February 2009 increased the subsidy rate for families with more than two children. Yet, as the Federal budget gets more stretched in the future, it seems reasonable to consider potential cuts in the program. This section examines the potential distributional impact of changes to the EITC parameters. The EITC can be (re)designed to achieve very different distributional objectives. For example, current proposals to expand the childless adult credit would better target the lowest-income tax-payers and extend coverage to more lower-income tax filers at lower cost.

We evaluate several hypothetical reforms to the EITC, including both expansions and contractions of the program. Table 3 presents the parameters for 2004 (current) law — Panel A — and for each reform. Panel B presents two reforms that expand the

**Table 3**  
EITC Parameters under Alternative Simulations

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

program by (1) increasing the phase-in rate (and hence increasing the maximum credit and phase-out range), and (2) expanding the credit for childless adults. Panel C presents the parameters of what we term “universal” reforms, which reduce the phase-out rate to one-third the current-law rate (5.33 percent and 7.02 percent for families with one and two-or-more children, respectively) and thereby expand eligibility further up the earnings distribution. Panel D presents the parameters of what we term “targeted” reforms, which raise the phase-out rate three-fold (47.94 percent and 63.18 percent, respectively) and thereby focus the credit on lower-earning tax filers.<sup>8</sup> For the universal and targeted reforms, we consider both non-revenue neutral and revenue neutral variations. We impose revenue neutrality 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 on 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 suggestive, however, since a comprehensive 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 VI, in which we carry out a welfare evaluation of different EITC phase-out rates.

Our profile of the EITC population is based on the 2004 SOI Public Use Tax Data. Using the NBER’s TAXSIM model, we recalculate each individual tax filer’s tax liability and marginal tax rate under alternative EITC policies. We then sum the individual data to get the total number of recipients and total cost.<sup>9</sup> 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 VI) 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 thus assume no changes in labor supply or earnings (we relax this assumption in Section VI).<sup>10</sup> 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

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<sup>8</sup> Removing the “AMT patch” and eliminating the 2001 and 2003 tax cuts lead to no significant changes for the EITC. In an effort to lessen 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). We find that these changes were modest in size and impact; these results are available upon request.

<sup>9</sup> Dan Feenberg was incredibly helpful in coding all of the alternative EITC policies and making this analysis possible with TAXSIM.

<sup>10</sup> For married couples, we calculate the marginal tax rate for the primary earner.

decile under current law and the alternative policies in Table 4.<sup>11</sup> We compare marginal and average tax rates under current and the alternative policies in Table 5. Below, we discuss each reform separately, considering first expansionary reforms.

### A. Expansionary Reform 1: Increased Subsidy Rate

Our first simulation 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 (Figure 9a). We hold fixed the size of the phase-in and flat regions and so raise the maximum credit to \$3,487 (\$5,754) for those with one child (two more children).<sup>12</sup> Note 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.

Our simulation estimates that this expansion would cover an additional 2.5 million tax filers (11 percent of the population) but does so at a high cost — \$20 billion (or nearly 50 percent of current law expenditures). This expansion creates winners and no losers among EITC recipients.<sup>13</sup> 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 tax filers with higher incomes — 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 receive 52.1 percent. Those who gain most have income in the 5<sup>th</sup> and 6<sup>th</sup> deciles of the income 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 5 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 7<sup>th</sup> decile benefit, but that the largest gains accrue to the second and third decile (who are primarily in the EITC's flat region). By reducing their tax liabilities, this reform expands the budget set for all eligible filers

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<sup>11</sup> Note that the numbers for “current law” in Table 4 differ slightly from the results presented earlier in Tables 1–2. The current law numbers in Table 5 use TAXSIM to calculate the EITC under current law assuming a 100 percent take-up rate. This provides the best comparison to the simulations of the alternative policies. Our re-calculation of current law shows about 22.9 million recipients about 800,000 more than under current law. Most of the additional recipients are childless adults.

<sup>12</sup> This policy assumes no change to the credit for the childless.

<sup>13</sup> Taxpayers who finance the additional expenditures are losers, as in all scenarios that expand the EITC.

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.<sup>14</sup>

The EITC expansion considered here reduces marginal tax rates (increases subsidy rates) for some recipients and raises them (increases phase-out rates) for newly eligible recipients. This renders the pattern of marginal tax rates far more variable than the pattern of average tax rates (Table 5). Head of household and single filers face lower marginal rates, while joint filers face a slightly higher marginal tax rate on earnings. 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 the phase-out region. These filers have income in the 5<sup>th</sup> and 6<sup>th</sup> decile of the distribution and this factor explains 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 rate increases affect more individuals. 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 9b illustrates this reform and shows it to be a relatively modest expansion. The simulation suggests it would cover an additional 3.3 million tax filers (14 percent) and cost about \$2.8 billion per year (7 percent more than under current law). The distribution of the EITC tax cost changes in predictable ways. More benefits go to single filers and to filers with no children, but also to individuals in the phase-in and (mainly) flat regions (relative to the 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 results on labor supply and taxes generally suggests small elasticities (Pencavel, 1987). However, in work that does not incorporate income taxes, Juhn (1992) finds substantial declines in labor market participation in the 1970s and 1980s by less-skilled men in response to deteriorating wage opportunities. It is therefore possible that this reform will generate some labor supply and efficiency gains.

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<sup>14</sup> For a full discussion of welfare effects along the discrete labor force participation margin, see Section VI.

**Table 4**  
**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
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	6.6	5.7	7.4	4.0	5.2	9.9	8.8
0-10%							
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

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.

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

**Table 5**  
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	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		-1.3	-0.7	-2.6	-1.5	4.3	3.2				
Newly ineligible											
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				

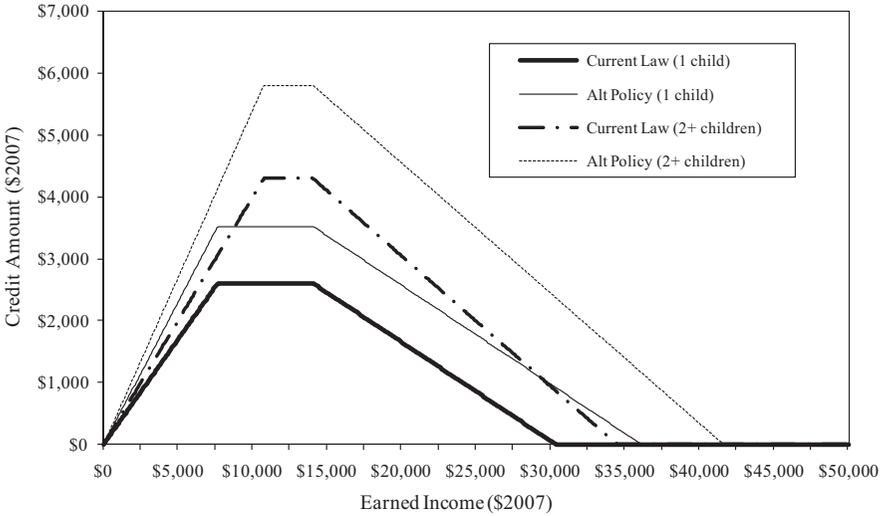
	Marginal Tax Rate by									
<b>Marital status</b>										
Head of household	7.5	-0.5	0.1	-3.1	-1.8	1.2	2.4			
Joint return	16.8	0.4	0.0	0.3	-0.1	-0.1	0.2			
Single	12.1	-0.1	0.3	-0.1	0.0	0.1	0.0			
<b>EITC range</b>										
Not eligible	18.0	0.0	0.0	-0.2	-0.1	0.0	0.1			
Phase-in	-8.8	-2.6	-0.9	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	14.8		5.6	5.8	5.5					
Newly ineligible						-15.3	-14.9			
<b>Cash income decile</b>										
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			

Notes: 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). <sup>a</sup>“Current law” is not the actual tax cost but our recalculation using TAXSIM assuming a 100 percent take-up rate in the EITC. <sup>b</sup>“Newly ineligible” and <sup>c</sup>“newly eligible” refer to the portion of the phase-out range that is expanded or contracted with the change in policy.

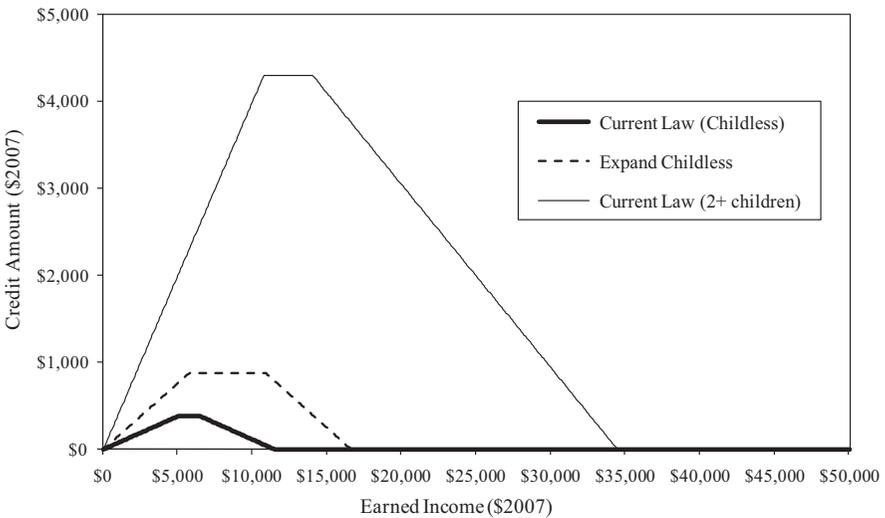
Source: Authors’ tabulations of the 2004 SOI Public Use File.

**Figure 9**  
Expansionary EITC Reforms

(A) Increase Phase-in Rate



(B) Expand Childless Credit



### 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 4). Because of the scale of this expansion, illustrated in Figure 10a, 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 10b.

The revenue neutral reform is projected to cover 7.3 million (or 32 percent) more tax filers. 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.

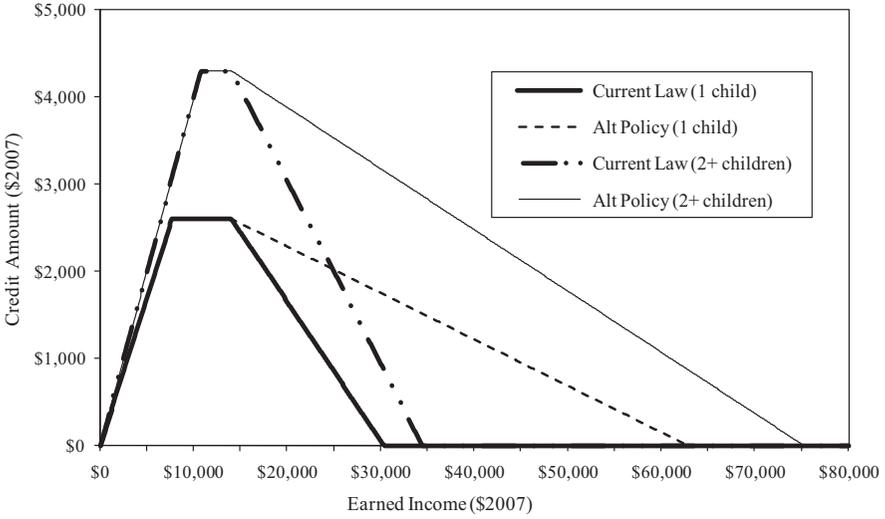
The impact of these redirected benefits on tax liability and average tax rates is stark. Tax liability rises everywhere along the EITC schedule except for those who are newly eligible. The 7 million newly-eligible filers get a 1.5 percentage point reduction in their average tax rate. The distribution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

### D. Targeted Reforms

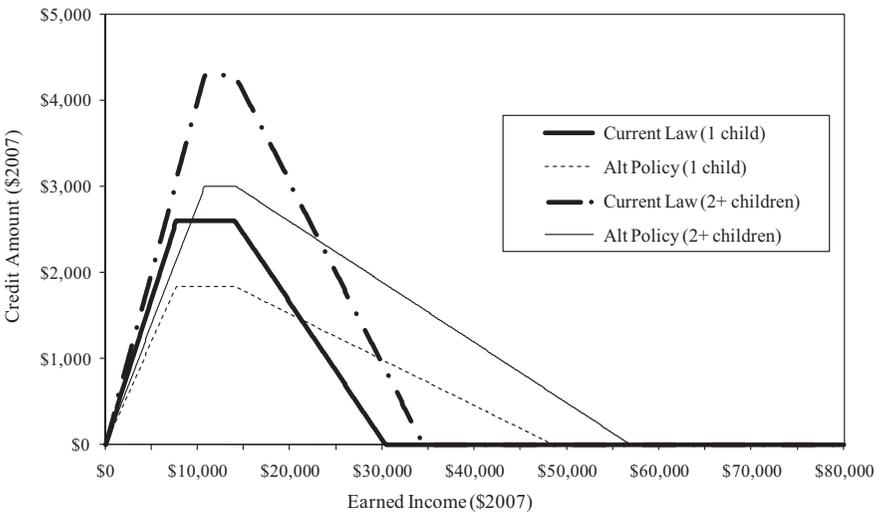
Our final set of large reforms target the credit by curtailing substantially the reach of the phase-out region. This is accomplished by raising sharply the phase-out rate from the 15.98 (21.06) percent for families with one child (two or more children) under current law to 47.94 (63.18) percent (Figure 11a). These rates might seem entirely unrealistic, but we note they are quite modest for traditional welfare programs, such as TANF and

**Figure 10**  
EITC Reforms Increasing "Uniformity"

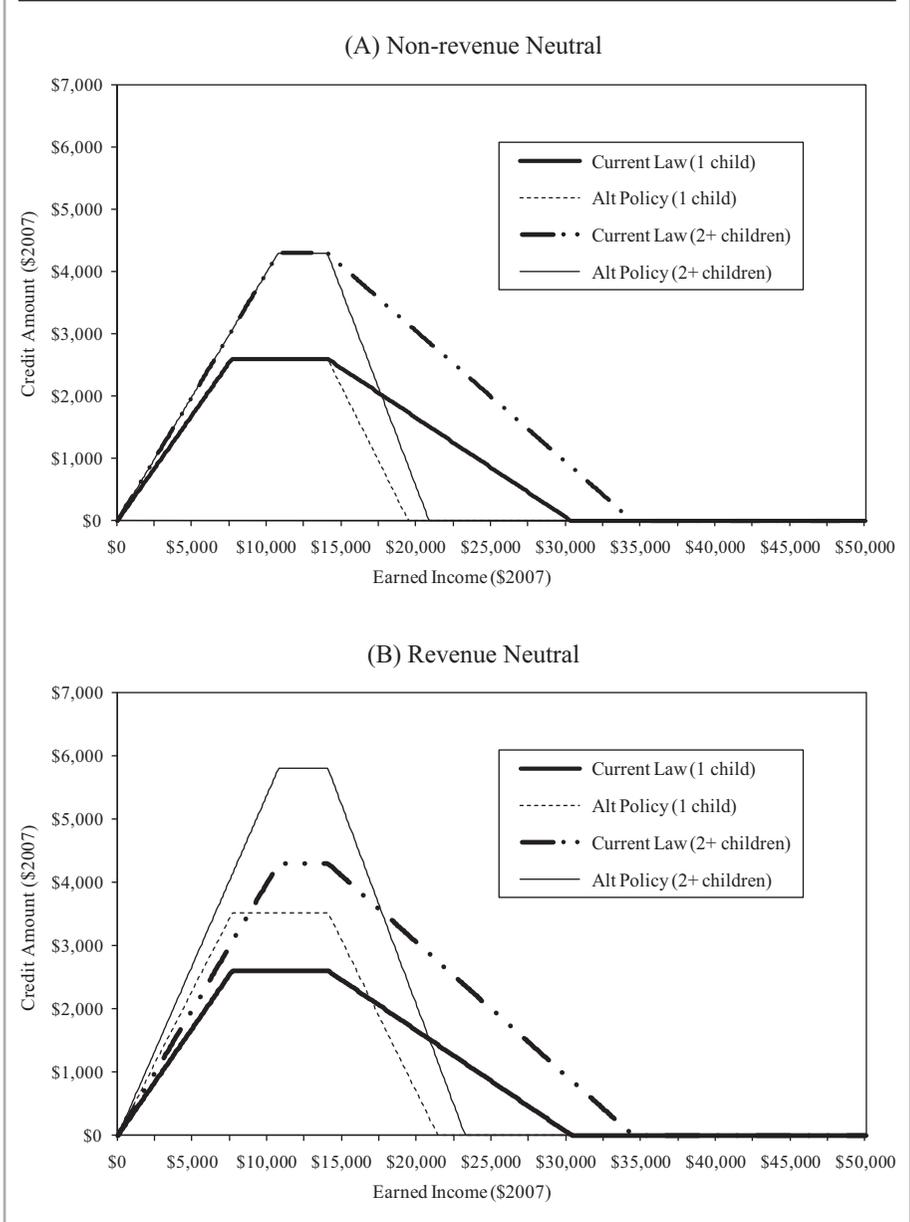
(A) Non-revenue Neutral



(B) Revenue Neutral



**Figure 11**  
EITC Reforms Increasing "Targeting"



its predecessor, Aid to Families with Dependent Children (AFDC). The net impact is to render ineligible for the credit tax filers 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 4). The revenue neutral version of this reform, illustrated in Figure 11b, uses the tax-revenue savings to finance 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 3.

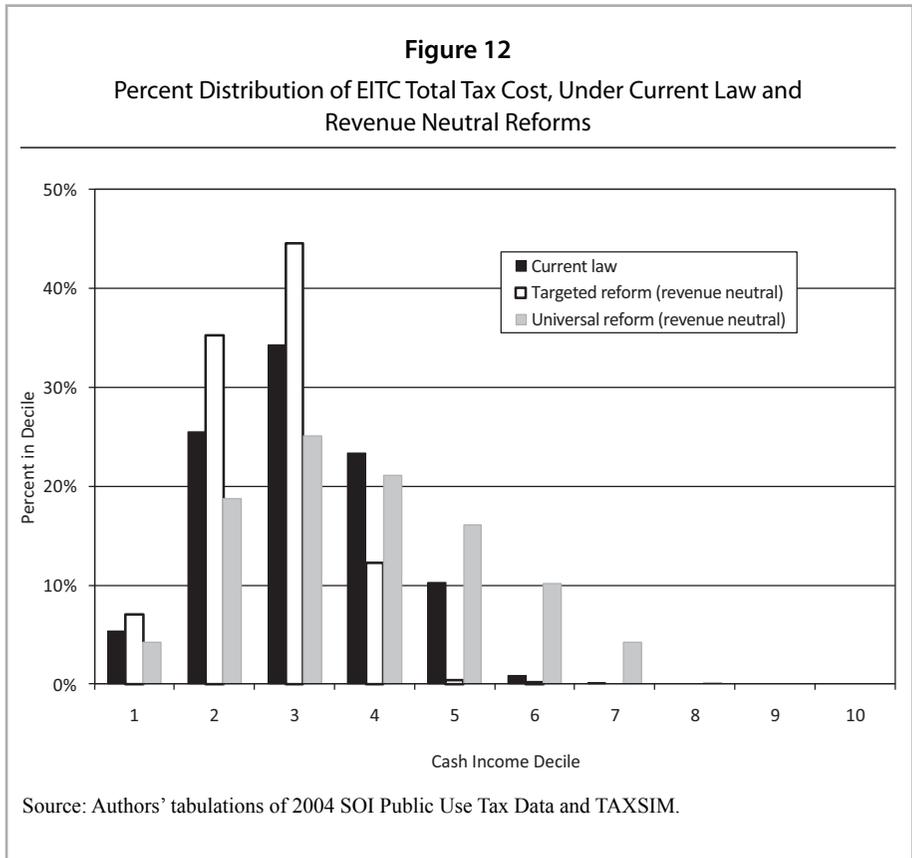
On net, the revenue neutral targeted EITC reform eliminates 5.4 million recipients (a decline of about 23 percent), who are more likely to be joint filers. Therefore, we observe redistribution from joint filers (who have higher incomes) to single and (mainly) head of household filers. There is very little 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 4<sup>th</sup> decile to deciles below. In fact, this reform transfers 88.7 percent of the credit to filers with incomes at or below the 3<sup>rd</sup> decile (compared to 66.9 percent under current law and 49.6 under the comparable universal reform). Figure 12 illustrates further the differences in the distribution of benefits under current law and each of the revenue neutral reforms (universal and targeted).

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

Marginal tax rate changes, on the other hand, suggest substantial distortions to tax filers in the phase-out region (where the increase in the MTR is fully 11 percentage points). These are offset, however, by reductions in the marginal rates that newly ineligible filers now face, which are on the order of 15 percentage points. Along the cash-income distribution, marginal rates fall for everyone except those in the 3<sup>rd</sup> and 4<sup>th</sup> deciles, who face marginal tax rates that are 6.6 to 6.9 percentage points higher. Distortions to hours worked for some individuals are therefore offset by better incentives for others. This pattern again complicates somewhat the inference about potential efficiency effects. 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.

## VI. EFFICIENCY IMPACTS OF THE EITC

Previous work has argued the composition of labor supply responses (greater along the extensive than intensive margin) has important implications for the welfare evaluation of taxes. Saez (2002) shows that accounting for labor force participation responses



changes the optimal transfer program, if participation elasticities are sufficiently high. More precisely, the optimal tax-transfer scheme is similar to an EITC, with negative marginal tax rates at the bottom of the earnings distribution. In the standard model with only intensive (hours worked) responses, an EITC would be inefficient.<sup>15</sup>

Liebman (2002) examines the optimal design of the EITC, using a micro-simulation model, calibrated to 1999 CPS data. His model has fixed costs (nonconvexities in the budget set), which are significant because they allow first-order welfare effects along the extensive margin. This allows him to illustrate the trade-offs between efficiency and equity in the design of an EITC, including the optimal maximum credit, phase-in rates, and phase-out rates. Liebman finds that the efficiency cost of transferring income through the EITC is substantially lower than previous studies of the EITC have found (Browning, 1995), in large part because of the participation response of

<sup>15</sup> Saez (2002) 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.

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.<sup>16</sup> Eissa, Kleven, and Kreiner (2008), hereafter EKK, take a reduced-form approach to examining the impact of participation responses on the welfare evaluation of tax reforms in 1986, 1990, 1993, and 2001. They extend the standard framework for welfare evaluation of tax reforms to include non-convexities in preferences and budget sets. Incorporating discrete choice allows different tax changes (and efficiency effects) along the intensive and extensive margins. The 1993 expansion is especially interesting because it reduced the tax rate on labor force participation but increased the marginal tax rates on hours worked for most workers. EKK show that ignoring the participation margin can reverse the sign on the welfare effect of taxation. More generally, their findings show that conflating the average and marginal tax rates in welfare analysis can be fundamentally misleading.

### A. Welfare Analysis of the EITC for Single Mothers

It is useful to start by characterizing the welfare effect of tax reform as the “behavioral revenue effect,” or the effect of behavioral responses on government revenue. This is related to two distinct margins of labor supply response: hours worked and labor force participation. The first effect captures the revenue effect from the change in the optimal hours worked by 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-market entry (the *participation tax rate*), the efficiency effect from changed working hours depends on the tax burden on the last dollar earned (the *marginal tax rate*).

In this section, we examine small reforms by applying the reduced-form methods from EKK. This approach has the advantage that it is representative of the set of refinements the EITC regularly undergoes. Arguably, the EITC is unlikely to be overhauled in a major way, absent major tax reform. Another advantage is the simplicity and transparency of small reforms. To see this advantage, consider that large reforms generate first-order labor supply and revenue effects, so that a full analysis of the welfare effects would have to reflect the externalities created by changes in government revenue. Here, we largely (though not completely) avoid the need to specify utility functions and to estimate (or calibrate) utility parameters and the fixed costs of work that generate discrete responses along the extensive margin.

Our simulation approach uses the methods and deadweight loss formula in EKK. We review only the basic methods here. We focus our welfare analysis on single parents

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<sup>16</sup> It should be noted that this estimate is higher than those found in the broader literature on the marginal efficiency cost of redistribution (e.g., Ballard’s (1988) evaluation of similar wage-based transfers). Different data, methods (computable general equilibrium versus micro-simulation), and underlying parameter assumptions likely explain some of the differences.

(head of household filers), who represent the largest group of recipients, accounting for about 65 percent of EITC recipients and expenditures. This is also the group for which discrete responses have been shown to be especially important.

We begin by creating a sample of single parents from the Current Population Survey (CPS) who are between 18 and 49 years of age. We use the CPS data to estimate an earnings equation using the sample of working women and adjusting for the participation decision. For each sample member, we then predict earnings using the estimated earnings equation and use TAXSIM to calculate their earned income credit and net tax liability. To be consistent and to avoid the problem of endogenous earnings and tax rates, we impute these data for workers and non-workers alike (rather than using their actual earnings). Third, we simulate individual marginal and average tax rates under current law and under the marginal reforms (again using predicted, rather than actual, earnings). Finally, we calculate welfare effects based on the imputed tax rates and assumed elasticities, again following EKK.

Tax rates are simulated using the NBER TAXSIM model augmented by a simple welfare calculator. This allows us to generate the impact of the total tax-transfer system. Our measure of effective tax rates therefore includes federal and state taxes, payroll taxes, and public assistance (cash, Food Stamps, and Medicaid).<sup>17</sup> 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 (Moffitt, 1992).

## B. 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 adding or subtracting one percentage point (from a base 15.98 percent for single mothers with one child and 21.06 percent for those with two or more children). This extends the credit to tax filers 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. Second, we change the subsidy rate in the same way (from a base of 34 and 40 percent, respectively). The reduced subsidy rate generates an eligible earnings range similar to the higher phase-out rate, allowing us to evaluate the impact of transferring money to similar populations but using different instruments. The full parameters of these small EITC reforms are shown in Panels E and F of Table 3.

Although we run the full set of simulations, we present only the results for the impact of a more generous EITC.<sup>18</sup> We first examine a lower phase-out rate and then a higher subsidy rate.

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<sup>17</sup> We assume workers bear the full incidence of employer payroll taxes, and adjust pre-tax wages accordingly. This adjustment reduces the effective tax rates associated with all the different taxes and benefits, not just the payroll tax.

<sup>18</sup> The other results are available upon request from the authors.

### 1. *More Generous EITC: Lower Phase-out Rate*

Panel A of Table 6a shows the impact of reducing the phase-out rate by 1 percentage point on the number of recipients and on average and marginal tax rates. Nearly a quarter million new single mothers would be covered by the more generous EITC (for a total of 12.89 million). The participation tax rate falls by 0.1 percentage points, from 27.1 percent to 27.0 percent of wage income. This decline is concentrated in the original and extended phase-out region (where a decline of 0.3 percentage points is experienced by both groups). On the intensive margin, tax rates decline by 0.2 percentage points overall, but show a far less systematic pattern. Marginal tax rates decline by 0.9 percentage points for the 7.64 million EITC recipients in the (current-law) phase-out region and increase by a full 15.2 percentage points for the 0.23 million newly-eligible recipients. The tax wedge for the population eligible for this more generous EITC, not reported in the table, is about 0.367 on the extensive margin, and 0.528 on the intensive margin.<sup>19</sup>

Making the EITC less generous (e.g., increasing the phase-out by 1 percentage point) has impacts that are similar in size but of the opposite sign. About 210,000 taxpayers in the (current-law) phase-out of the EITC would lose eligibility, and face marginal tax rates that are on average 16.7 percentage points lower than under current law.

### 2. *More Generous EITC: Higher Subsidy Rate*

Raising the subsidy rate by 1 percentage point, while holding all other parameters fixed, is simulated to extend benefits to 115,000 new tax filers. A greater credit amount reduces the overall tax burden and makes entry into the labor market more rewarding: the overall participation tax rate among tax filers eligible for the EITC falls by 0.5 percentage points. The unchanged overall marginal tax rate is somewhat misleading because it masks substantial heterogeneity across the population. Tax filers in the phase-in region see a 0.9 percentage point reduction in their marginal tax rate while marginal tax rates among tax filers newly eligible for the EITC rise substantially, on the order of 15.9 percentage points.

The results in Table 6a show that changes in the two instruments (subsidy rate and phase-out rate) can have very different effects on the participation and marginal tax rates. First, the table shows that changes in the subsidy rate have a greater impact on participation incentives than changes in the phase-out rate. This is because changes in the subsidy reduce the tax burden throughout the EITC range while changes in the phase-out rate affect only those at the higher end of the EITC-eligible income range (where we might expect labor-force participation to be less sensitive to taxes). In contrast, changes in the subsidy rate have a smaller impact on the incentives for hours worked than changes in the phase-out rate because few workers are located in the subsidy region.

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<sup>19</sup> The tax wedge is the tax rate divided by one minus the tax rate. The tax wedge figures reported in the text are calculated under current law.

**Table 6a**  
Impacts of a More Generous EITC on Incentives at the Intensive  
and Extensive Margins

	Population (millions)	Current Law Participation Tax Rate	Change in Participation Tax rate	Current Law Marginal Tax Rate	Change in Marginal Tax rate
A. Marginal Reform 1: 2004 EITC with lower phase-out rate					
Total single mothers	14.954	0.271	-0.001	0.291	-0.002
By EITC region					
Phase-in	2.333	0.150	0.000	0.007	0.000
Flat	2.688	0.153	0.000	0.176	0.000
Phase-out	7.641	0.308	-0.003	0.402	-0.009
Newly eligible	0.227	0.387	-0.003	0.322	0.152
B. Marginal Reform 2: 2004 EITC with higher subsidy rate					
Total single mothers	14.954	0.271	-0.005	0.291	0.000
By EITC region					
Phase-in	2.333	0.150	-0.009	0.007	-0.009
Flat	2.688	0.153	-0.007	0.176	0.000
Phase-out	7.641	0.308	-0.004	0.402	0.000
Newly eligible	0.115	0.383	-0.001	0.326	0.159

Notes: EITC regions assigned under current law EITC parameters. Numbers do not add up to the total because the total includes non-EITC eligible families. Participation and marginal tax rates are means under current law. Difference is alternative policy minus current law.

Source: Authors' tabulations of the 2005 March CPS.

### C. Impacts of Small Reforms on Economic Welfare

Table 6b presents the efficiency analysis. We use a moderate total labor supply elasticity of 0.4, and assume the response is concentrated along the participation margin — the participation elasticity ( $\eta$ ) is set to 0.3 and the intensive, compensated hours-of-work elasticity ( $\epsilon$ ) is set to 0.1. We show the welfare effect, along the intensive (column 1) and extensive (column 2) margins, and overall (column 3). We also present the “traditional” welfare effect (column 4) which ignores the extensive margin response and applies the total labor supply elasticity of 0.4 to the intensive margin. Column 5 shows the tax burden reduction, as a percentage of wage income, and column 6 shows the welfare gain per dollar spent (column 6).

**Table 6b**  
**Welfare Effects of EITC Changes for Single Mothers by EITC Region**  
**(Percent of Wage Income)**

	Welfare Effect				Tax Burden Reduction (5)	Welfare Gain per Dollar Revenue (6)
	Intensive (1)	Extensive (2)	Total (3)	Traditional (4)		
A. Lower Phase-out						
Total single mothers	0.022	0.029	0.050	0.086	0.179	1.391
By EITC region						
Phase-in	0.000	0.000	0.000		0.000	
Flat	0.000	0.000	0.000		0.000	
Phase-out	0.041	0.028	0.068		0.319	
Newly eligible	-0.019	0.001	-0.018		0.254	
B. Higher Subsidy						
Total single mothers	-0.011	0.036	0.026	-0.043	0.326	1.086
By EITC region						
Phase-in	0.000	0.002	0.002		0.928	
Flat	0.000	0.004	0.004		0.715	
Phase-out	0.000	0.031	0.030		0.408	
Newly eligible	-0.010	0.000	-0.010		0.109	

Notes: The welfare gain is measured as a percent of wage income and is calculated using equation (23) in Eissa, Kleven, and Kreiner (2008). The total welfare gain is calculated as the sum of the intensive and extensive gains. The intensive labor supply elasticity is 0.1 and the extensive labor supply elasticity is 0.3 for a total labor supply elasticity of 0.4. The “traditional” welfare gain is calculated assuming the total labor supply elasticity is along the intensive margin (and therefore is equal to 4 times the figure in column 1). The reduction in tax burden measures the decrease in tax liabilities as a percent of wage income and before any behavioral responses. The welfare gain per dollar spent equals  $CTB/(CTB-EG)$  where EG is the efficiency gain and CTB is the change in tax burden. Data come from the March 2005 Current Population Survey. EITC regions assigned under current law EITC parameters.

Before proceeding, we note an important caveat to the welfare analysis. Although we consider only a 1 percentage point change in the phase-out and subsidy rates, these small changes in EITC parameters lead to large changes in the marginal tax rates for (small) subsamples of the population. This is a simple result of the nonlinearity of the EITC schedule. This raises questions about the validity of this as a “small reform” exercise. However, a comprehensive welfare analysis is beyond the scope of this paper. Instead,

we show separately the estimated welfare effects within each EITC region, and for newly eligible tax filers. We opt for this approach over the alternative of eliminating tax filers whose eligibility status changes as a result of the EITC expansion.

Making the EITC more generous generates a welfare gain for single mothers. Both the lower phase-out rate and a higher subsidy rate raise economic welfare, but they do so through different channels. We find a lower phase-out rate creates welfare gains along both the intensive and extensive margins, whereas the greater subsidy generates gains along the extensive margin only.

Panel A of Table 6b shows that reducing the phase-out rate by 1 percentage point creates an overall welfare gain of 0.05 percent of wage income (column 3). This occurs equally along the intensive (0.022 percent of wage income) and the extensive (0.029 percent) margins. Consistent with the findings on tax rates (Table 6a), we find substantial heterogeneity in the welfare effects across the EITC schedule. The extensive-margin gains occur solely for workers whose incomes are predicted to be in the phase-out region, where the participation tax rates decline. The overall welfare gain along the intensive margin gain is more complicated to characterize, and reflects offsetting effects for tax filers with incomes in the (current law) phase-out region and tax filers newly eligible for the EITC. The lower phase-out rate reduces the marginal rate and generates a welfare gain for EITC recipients in the (current-law) phase-out region equal to 0.041 percent of wage income. But it also adds new recipients whose marginal rate increases by 15.2 percentage points and these new recipients experience a welfare loss of about 0.02 percent, which dampens the overall welfare gain.<sup>20</sup>

We also examine the impact of the participation response in the calculation of the welfare effect, by assuming the labor supply response occurs entirely on hours worked. This “traditional” approach yields a welfare gain that is nearly two-thirds greater, at 0.086 percent. We show below that in some cases, the traditional approach not only yields the wrong magnitude, but in some cases the wrong sign.

The efficiency effects are somewhat different when the subsidy rate is increased. The net welfare gain of 0.026 percent of wage income represents offsetting effects along the intensive margin (a loss of 0.011 percent of wage income) and the extensive margin (a gain of 0.036 percent). The welfare loss along the intensive margin seems counter-intuitive since the higher subsidy reduces the marginal tax rate on hours worked. But it is entirely plausible, since although a higher subsidy rate reduces the marginal tax rate in the phase-in region, few workers are located there. At the same time, the higher subsidy rate increases the maximum income for EITC eligibility, adding 115,000 new recipients, all of whom face substantially higher marginal tax rates. Ultimately, the welfare loss incurred by new recipients dominates the (nearly non-existent) gain for

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<sup>20</sup> In simulations not presented, we also find an intensive margin welfare gain (of 0.050 percent of wage income) with a higher phase-out rate. This occurs because the efficiency gains for newly-ineligible taxpayers, whose marginal tax rates fall by an average 16.7 percentage points, dominates the welfare loss for the recipients whose marginal rate rises by 0.9 percentage points. These findings highlight the important role of the distribution of taxpayers along the EITC schedule and of individual heterogeneity.

very low-income workers. Our analysis also shows the importance of accounting for the composition of the labor supply response in evaluating welfare effects. The traditional approach (column 4) would have predicted a welfare loss from this expansion of the EITC of 0.043 percent.

To facilitate comparison across different instruments, we calculate the welfare gain per dollar spent. Column 6 shows this estimate to be in the range of 1.09 to 1.39. Comparing the welfare effects per dollar spent for the two instruments shows they are more sensitive to the total labor supply elasticity when the phase-out rate is changed. This is notable because the welfare gain per dollar spent is larger than one, implying that the tax cuts for single mothers may generate pure efficiency gains even if the expansion is financed using distortionary taxation. For the EITC expansion to create efficiency gains in this case, the marginal cost of funds (MCF) would have to be lower than the welfare gains per dollar spent reported in the table. Although MCF estimates are highly sensitive to the design of the tax increases (Kleven and Kreiner, 2006), it is notable that even with a MCF of 1.4 — a reasonably high value given existing estimates — the tax cuts to single mothers are creating pure efficiency gains for at least the phase-out rate cut. This result is quite important, since one could thus justify the EITC expansion without appealing to higher social-welfare weights for lower-income single mothers than for the rest of population.

## VII. CONCLUSION

The Earned Income Tax Credit is one of the 10 costliest tax expenditures in the federal income tax system (U.S. Government Accountability Office, 2005). The total tax cost of the EITC, including the pure tax expenditure as well as the outlay, was \$40 billion 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, which takes 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 by appealing to arguments based on both efficiency (promoting work) and equity (the working poor have greater social welfare weights than the non-working poor).

The reason for providing a transfer like the EITC through the tax system 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 already measured by the IRS. Further, there may lower “stigma” with a tax-based benefit, which increases participation in the program and individual welfare. However, the IRS may not be well suited to monitoring compliance with other aspects of the credit eligibility, such as verifying the status of 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 operation of the EITC, describe its incentive effects, and review the empirical

literature on measuring these 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 these 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 these reforms, we also discuss how the policies change incentives for work by simulating the changes to marginal and average tax rates.

Finally we conduct a welfare analysis of the EITC for single parents, applying the approach used in Eissa, Kleven, and Kreiner (2008). This allows us to capture the changes in efficiency associated with changes on the extensive and intensive margins of labor supply. We show that making the EITC more generous by reducing the phase-out rate is welfare improving, and for some labor supply elasticities, could be justified without appealing to differentially higher welfare weights for single mothers. Changing the subsidy rate generates welfare gains, but of a smaller size, and so could only be justified with higher weights on the welfare of single mothers than for the rest of the population.

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