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THE EARNED INCOME TAX CREDIT

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ABSTRACT

Since its inception in 1975, the Earned Income Tax Credit (EITC) has grown into the largest, Federally-funded means-tested cash assistance program in the United States. In this chapter, we review the political history of the EITC, its rules and goals and provide a broad set of program statistics on its growth and coverage. We summarize conceptual underpinnings of much of the recent economic research on the EITC, discussing participation in the credit and compliance with its provisions, and its effects on labor force participation and hours of work, marriage and fertility, skill formation and consumption. We note that participation rates of the credit are high, rates of credit noncompliance are also high, and that there are theoretical reasons to prefer the EITC to other anti-poverty programs if one's objective is to encourage work among the poor. We also note that the predicted effects of the EITC are not all pro-work, especially with respect to hours and its labor market incentives for two-earner couples. We then summarize the existing empirical research on the behavioral effects of the EITC, paying particularly emphasis to the effects of the 1986, 1990 and 1993 expansions of the credit on labor force participation and hours of work. The literature provides consistent evidence, generated from a variety of empirical approaches, that the EITC positively affects labor force participation. The literature also finds smaller, negative effects on hours of work for people already in the labor market and for secondary workers. We conclude the chapter with a discussion of the ongoing EITC-related policy debates and highlight what, if any, critical economic issues underlie these debates.

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I. Introduction

The earned income tax credit has grown from $3.9 billion in 1975 (in 1999 dollars), the first year it was part of the tax code, to $31.9 billion in 1999. No other federal antipoverty program has grown at a comparable rate. In 1999 EITC spending was within $4 billion of the *combined* federal spending on Temporary Assistance for Needy Families (TANF) and food stamps.[1]

The growth of the EITC has been even more striking given the antipathy most Americans express over welfare,[2] and the rhetoric of both political parties about recognizing the limitations of Government programs. The EITC's popularity relative to means-tested cash transfers like the old Aid to Families with Dependent Children (AFDC) and new TANF programs is due, at least in part, to the perception that the EITC rewards work.

The credit began as part of a broader effort by Senator Russell Long (D-LA) to derail Congressional and Presidential interest in a negative income tax (NIT) in the late 1960s and early 1970s. The initial debates highlighted a tension that exists to this day. The attraction of the NIT was that as a universal *antipoverty* program – it would provide a guaranteed minimal standard of living to all in an administratively efficient way (though the tax system) without having the notches and high cumulative marginal tax rates that characterize a patchwork system of narrower programs. Senator Long's primary objection to the NIT was that it provided its largest benefits to those without any earnings, and hence would dull the labor market attachment of poor families. His alternative, initially called the "work bonus," would phase in and so increase with earnings up to a point.

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[1]The FY2001 Budget indicates total food stamp spending in 1999 is $19.0 billion and total TANF spending is $16.7 billion. The total EITC tax expenditure is $31.9 billion.

[2]The General Social Survey at the University of Chicago has, over time, asked people "Are we spending too much money, to little money, or about the right amount on welfare." In the 1972-82 surveys, 54.8 percent of the respondents replied "too much." This number has fluctuated over time, but in the most recent 1996 survey, 57.7 replied "too much."

Over the years, the EITC has played different tax policy, labor market and antipoverty roles. In Section II, we review the political history of the EITC, its rules and goals and provide a broad set of program statistics that summarize its growth and coverage. Various goals of the program occasionally come into conflict. For example, in the most recent expansion that occurred as part of the 1993 budget bill, the EITC was singled out as an important anti-poverty program that in addition, has positive (relative to alternatives) labor market incentives. Around the same time, however, studies of EITC noncompliance suggested that the credit was difficult for the Internal Revenue Service (IRS) to administer. One's view of the credit will be influenced significantly by the weight one places on its antipoverty effects, its labor market effects and the ability of the IRS to administer the credit.

The core of this chapter is a discussion of EITC-related behavioral issues and research. Section III provides EITC program statistics. As would be expected with a program that has more than tripled in size (in real dollars) in the 1990s, there has been a considerable amount of attention paid to the EITC in recent years. In Section IV of the chapter, we outline the conceptual underpinnings of much of this recent work, discussing EITC participation and compliance, its effects on labor force participation and hours of work, marriage and fertility, skill formation and consumption. In this overview, we show there are theoretical reasons to prefer the EITC to other anti-poverty programs if one's objective is to encourage work among the poor. At the same time, the predicted effects of the EITC are not all pro-work, especially with respect to hours and its labor market incentives for two-earner couples. But a policy focus only on labor markets would be overly narrow, since it is clear that the EITC has the potential to affect almost every dimension of economic behavior.

Section V of the chapter reviews the evidence to date on these behavioral issues. Existing EITC research meshes tightly with the goals of the credit that have influenced its evolution. Given the design and size of the credit, it is not surprising that the credit delivers significant resources to working poor families. A large set of studies examine the credit's labor market effects, as would be expected given a central distinction between the EITC and NIT approach to antipoverty policy is the expected superiority of the EITC in encouraging labor force participation. Recent studies have also focused on the degree to which expansions of the EITC over the last 20 years can explain trends in labor force participation for single women with children in the U.S.

As highlighted in Moffitt (1998), many studies over the last 10 years have examined the effects of programs like AFDC, Medicaid and Food Stamps on family structure and children's well-being. These studies have been motivated by a growing concern in the U.S. that public assistance programs have contributed to the rise in out-of-wedlock childbearing and female headship, two behaviors that are associated with the incidence of poverty, especially among children. Until very recently, however, little attention has been paid to the effects of the EITC expansions on these same behaviors. We discuss the recent EITC-related studies on this issue. We also discuss recent studies of the EITC's effect on consumption patterns of the poor. Because the credit is administered through the nation's (and, in some cases, state's) income tax collection systems, EITC payments to low-income households are typically received once a year, as an adjustment to tax liabilities or refunds. This payment pattern contrasts to monthly payments typically associated with AFDC/TANF and food stamps and may provide a way to gain additional insight into the nature of credit markets and consumption behavior for low-income families.

Our goal in Section V is to succinctly, yet accurately, summarize what has been done, evaluate the strengths of this work and identify areas where additional work could be useful to either verify existing conjectures or alter what we thought was known.

In the final sections of the chapter, we briefly discuss ongoing EITC-related policy debates and highlight what, if any, critical economic issues underlie these debates. We also briefly identify issues on which there is a need for future research.

II. Program History, Rules, and Goals[3]

It is not surprising, given its status as the largest cash or near-cash antipoverty program, that fundamental tensions in the design of the safety net arise vividly at different points in the EITC's history. In the mid 1960s and early 1970s there was a great deal of discussion about the appropriate design of antipoverty policy. At the risk of oversimplifying, one part of the policy debate focused on either direct earnings subsidies (of which the EITC is one) or on subsidies paid to employers to hire disadvantaged workers. Remnants of the latter approach are found in the current, modest Work Opportunity and Welfare-to-Work Tax Credits that are part of the federal income tax system.[4] A problem with earnings or employment subsidies is that they do nothing for adults (and the children that live with them) who are unable or unwilling to work. Consequently, they must be matched with programs that help provide food, housing, health care and other basic needs to those not in the labor market.

The EITC was established in the political jostling surrounding negative income tax debates in the 1960s and 1970s. The NIT held great promise to the early designers of the War on Poverty since it would solve the difficult integration issues that arise with categorical antipoverty

[3]Our discussion of the EITC's political history comes directly from Liebman's (1997a) and Ventry's (1999) interesting accounts.

[4]For further discussion of employment subsidies and a broader treatment of employment strategies for low-wage labor markets, see Killingsworth (2000), Bishop and Haveman (1978) and Haveman (1996).

programs – the need for bureaucracies to administer and enforce eligibility and benefit rules and the need to mitigate potentially high marginal tax rates that recipients face as earnings increase. In part, for these reasons, in 1966 a negative income tax was the capstone of the Office of Economic Opportunity's – the federal agency in charge of conducting the War on Poverty – plan to eradicate poverty. President Johnson, however, opposed the negative income tax and a leading alternative proposal at the time, a guaranteed annual income, on the grounds that they undermined work effort. Without the support of the President, a negative income tax was not adopted. Nevertheless, in the late 1960s and early 1970s, the government launched the first widespread social experiments, the Gary, New Jersey, Iowa and Seattle-Denver Income Maintenance Experiments, to examine the effects of a negative income tax.

In 1969 President Nixon introduced a negative income tax called the Family Assistance Plan (FAP) that would replace the Aid to Families with Dependent Children program. Though it enjoyed widespread initial support, FAP was subsequently attacked by liberals as being insufficiently generous and by conservatives as being overly expensive and having insufficiently stringent work requirements.

Senate Finance Committee chair, Russell Long opposed the FAP and, as an alternative, designed in 1972 a proposal targeted at those willing to work. The proposal included a large public service jobs component and a "work bonus" equal to 10 percent of wages subject to Social Security taxation. FAP was defeated in 1972, but Senator Long aggressively pushed his work bonus scheme over the next three years. His efforts were aided by the confluence of three events. First, from 1960 to 1970 the payroll tax rate had increased to 4.8 percent from 3.0 percent (on *both* employers and employees) and it increased further to 5.8 percent in 1973, which focused attention on the rising tax burdens of low-income families. Second, fostered in part by the

income maintenance experiments, there continued to be a great deal of intellectual attention paid to negative income taxes in think tanks, universities and government agencies. Third, a recession started in 1974. This prompted members of Congress to try to stimulate aggregate demand by refunding in 1975 $8.1 billion in 1974 income taxes, and cutting 1975 income taxes by an additional $10 billion. With a tax bill being passed in 1975, Senator Long was able to enact a variant of his work bonus called the EITC, on a temporary, 18-month basis. The provision added a 10 percent supplement to wages up to $4,000 ($12,387 in 1999 dollars) for taxpayers with children and phased out at a 10 percent rate over the $4,000 to $8,000 income range.

Senator Long undoubtedly understood that once a provision is in the tax code, it is likely to remain. Indeed, the EITC remained in the tax code each subsequent year until it was made permanent in 1978. The 1978 legislation also added a flat range to the EITC's phase-in and phase-out ranges, as shown in Figure 1.[5] An "advance payment" option was also added to the credit in 1978, so that workers would be able, if so desired, to receive the credit incrementally throughout the year.

While spending on the safety net slowed in the late 1970s and shrank in the 1980s, the EITC varied little between 1978 and the Tax Reform Act of 1986 (TRA86). However, the lack of indexing in the tax code (and of the EITC) caused a substantial erosion of the real value of the credit over that period, so TRA86, as part of its efforts to eliminate taxes on poor families, increased the EITC to the point where the maximum credit in 1987 equaled the real value of the credit in 1975. TRA86 also indexed the credit for inflation. During this period the EITC continued to be supported by liberals and conservatives, both of who were sympathetic to the idea of reducing tax burdens on low-income families and rewarding work.

[5]The phase-in rate for the credit was 10 percent credit on earnings up to $5,000, for a maximum credit of $500. Over the flat portion of the schedule, the maximum credit was available for taxpayers with earnings between $5,000 and $6,000. The phase-out rate for the credit was 12.5 percent rate on incomes between $6,000 and $10,000.

Through much of the 1980s and into the 1990s, deficits were a dominant topic in Washington economic policy discussions. By 1990 annual deficit forecasts exceeding $300 billion "as far as the eye can see" were common, so that year President Bush agreed to abandon his "no new taxes" pledge and meet with Democratic leaders of Congress to fashion deficit reduction legislation. The torturous negotiations, which took place at Andrews Air Force Base, lead to the 1990 tax bill that phased out exemptions and itemized deductions on high-income taxpayers, and raised the highest marginal tax rate to 31 percent from 28 percent. While distributional issues have always played a role in tax policy, they played an exceptionally important role in 1990, perhaps because of antipathy the Democratic Congressional leaders felt toward the Republican President, and the sense by those leaders that the tilt of policy in the 1980s disfavored low-income families.[6] Whatever the reason, the EITC proved to be the easiest way to alter the distributional characteristics of various deficit reduction packages, and distributional tables became an important factor behind the 1990 EITC expansion that was phased in over three years. In 1991, the credit for the first time was also made larger for taxpayers with two or more children relative to the credit available to taxpayers with one child.

The most recent major change to the EITC occurred as part of the 1993 budget bill. In his first State of the Union Address, President Clinton said "The new direction I propose will make this solemn, simple commitment: by expanding the refundable earned income tax credit, we will make history; we will reward the work of millions of working poor Americans by realizing the principle that if you work 40 hours a week and you've got a child in the house, you will no longer be in poverty." This declaration completed the evolution of the EITC from Senator

[6]Many of the newspaper articles about 1990 budget talks emphasize distributional issues. See for example, "GOP's Tax Proposal Said to Favor Wealthy; Budget Talks Proceeding at 'Glacial' Pace," *Washington Post*, 9/14/90 (A12); and "Budget Negotiations Recess Amid Confusion on Progress; Officials Disagree on Extent of Disagreement," *Washington Post*, 9/18/90 (A1).

Long's modest "work bonus" to a major anti-poverty initiative. President Clinton set a target for the EITC: full time work at the minimum wage plus the EITC (and any food stamps the families is eligible for) should be enough to raise the family's net-of-payroll-tax income above the poverty line. To achieve this goal, the EITC was again increased, and sharply increased for families with two or more children.[7] In 1994 a small credit for the first time was made available to childless taxpayers.

The 1993 budget bill (and EITC expansion) passed by one vote in the Senate and received not a single supporting Republican vote. This too marked a transformation in the EITC's political history. For the first time, the EITC became a policy linked exclusively to Democrats. In the subsequent years, there have been highly partisan battles over EITC-related issues.

EITC Rules

To receive the credit taxpayers file their regular tax return and fill out the six-line Schedule EIC that gathers information about qualifying children. The EITC is refundable, meaning that it is paid out by the Treasury regardless of whether the taxpayer has any Federal income tax liability. There are several basic tests for EITC eligibility. The taxpayer must have earned and adjusted gross income below a threshold that varies by year and by family size. Until recently the taxpayer had to have a "qualifying child."[8] The qualifying child needs to meet age, relationship, and residence tests. The age test requires the child to be younger than 19, younger than 24 if a full-time student, or any age if totally disabled. The relationship test requires the claimant to be the parent or the grandparent of the child or for the child to be a foster child.[9] Under the

[7] The specific goal was achieved only for families with fewer than three children, and only after the minimum wage was increased in 1996 and 1997.

[8] A small credit available for childless taxpayers between the ages 24 in 65 with very low incomes was added in 1994. The credit rate for these taxpayers is 7.65 percent and the maximum credit in 1999 is $347.

[9] Until late 1999, a foster child was any child for whom the claimant cared for "as if the child is their own." Now the caring stipulation still holds, but the child must also be placed in the home by an authorized placement agency.

residence test the qualifying child must live with the taxpayer at least six months during the year (or 12 months if a foster child).[10] Another rule limits the sum of taxable and tax-exempt interest, dividends, net capital gains, rents, royalties and "passive" income to less than $2,350 (indexed for inflation).

In 1999, taxpayers with two or more children could receive a credit of 40 percent of income up to $9,540, for a maximum credit of $3,816. Taxpayers (with two or more children) with earnings between $9,540 and $12,460 receive the maximum credit. Their credit is reduced by 21.06 percent of earnings between $12,460 and $30,585. The EITC schedule in 1999 for families with two or more children is shown in Figure 1. Table 1 shows the complete evolution of income eligibility thresholds, credit rates, and phase-out (or implicit tax) rates.

Figure 2a shows total tax payments and marginal tax rates for two-parent, two-child families in Illinois (a state with relatively high tax rates on low-income families) in 1998.[11] We assume workers bear the full burden of payroll taxes, so the employer and employee share of payroll taxes is 14.2 percent.[12] The marginal tax rate line is initially at -25.8 percent, reflecting the sum of the 14.2 percent effective payroll tax rate and the -40 percent EITC rate. The flat portion of the EITC occurs around $10,000, where the Illinois household would face a 3 percent marginal state tax rate. Effective rates are 38.3 percent over much of the phase-out range, reflecting the sum of the 14.2 percent payroll tax, the 21.1 percent EITC phase-out, and the 3 percent Illinois state income tax. Rates jump to 53.3 between $25,000 and $29,000 as this family enters the 15

[10]In 1990 (tax year 1991) the residency and AGI tiebreaker (see below) tests replaced a support test, since in principle it is easier to verify where a child lives than it is to verify who supports a child. Under the support test the taxpayer had to pay for at least half the child's support, where items like transfer payments (i.e., AFDC and housing subsidies) and child support were not considered support provided by the taxpayer.

[11]19 states impose positive (but typically small) state income taxes on families of four with incomes below the poverty line (Johnson, 1999).

[12]Employers and employees both contribute 7.65 percent of earnings as payroll taxes, but the incidence assumption implies that after-tax earnings would be 7.65 percent larger in the absence of payroll taxes, so the effective payroll tax rate is (.153 / 1.0765) or 14.2 percent.

percent bracket of the federal income tax.[13] The corresponding average tax burdens are shown in the bars. Two-parent, two-child Illinois families would have negative combined income and payroll taxes up to roughly $17,200.[14]

Figure 2b shows the analogous situation for the same type of families in 1984, before the 1986 tax reform, and the 1990 and 1993 EITC expansions, all of which reduced taxes on low-income families. The pattern of marginal and average tax rates is strikingly different than what applied in 1998 to low-income families. The payroll tax (7 percent on employers and employees) was almost as high as it is now, resulting in an effective rate of 13.1 percent. The EITC was only 10 percent on incomes up to $5000, so even taxpayers with very low incomes faced positive marginal rates. The EITC was phased out at a 12.5 percent rate beginning at $6,000. In addition, the 11 percent Federal marginal tax bracket started at around $6,000 of income. Thus, all but the lowest income families faced marginal tax rates of at least 28 percent and some faced significantly higher marginal rates.

As of July 2000, fourteen states and the District of Columbia have EITCs as part of their state income taxes. The parameters of these credits are summarized in Table 2. Most are structured as percentages of the federal credit and use the same eligibility definitions. In New York, for example, the state EITC is 20 percent of the federal credit. Ten of the state EITCs are refundable and most make the credit available to workers without qualifying children.

Two unusual features show up in state EITCs. Wisconsin's state EITC has a three-tiered

[13]The EITC phase-out rate is lower for taxpayers with one child, but because they only receive one child credit and have one fewer personal exemption, one-child families begin to pay the federal 15 percent marginal income tax rate at an income of roughly $19,000. Hence, EITC recipients with one child and incomes between $19,000 and $27,000 have cumulative marginal tax rates nearing or above 50 percent.

[14]Low-income families would generally file returns because their incomes exceed filing thresholds or to get back withheld taxes. With the $500 child credit along with exemptions of $2,250 and the standard deduction of $7,200, a married couple with two children will not have a positive income tax liability until their earnings exceed $24,866, even without the EITC, but they will be required to file a tax return as long as their income exceeds $11,700.

schedule equaling 4 percent of the federal credit for taxpayers with one child, 14 percent of the federal credit for taxpayers with two children, and 43 percent of the federal credit for taxpayers with three or more children. This schedule was developed with explicit reference to the higher incomes that are needed to keep families with three or more children out of poverty. The Minnesota schedule includes a second phase-in range, developed to combat the problem that increases in wages or hours for certain minimum wage workers made them no better off because of the loss of cash assistance, food stamps and tax increases (see Johnson, 1999, page 25 for more details).

The state credits in combination with the federal credit can be substantial. A family with 3 or more children earning $9,600 in Wisconsin, for example, could receive a combined state and federal EITC of $5,457, or a 57 percent supplement to their earned income.

Interaction with Other Social Welfare Programs

The tax system operates independently of transfer programs, so there is relatively little interaction between the EITC and other programs. In 1979 (as part of a technical corrections bill) Congress required both advance and lump-sum EITC payments to be treated as earned income for AFDC, food stamp and SSI recipients. OBRA81 went even further in requiring welfare agencies to assume that individuals eligible for both the EITC and AFDC received the EITC incrementally through the year, thus likely lowering AFDC and food stamp benefits. In 1984 this position was reversed and states were allowed to reduce AFDC benefits only when they could verify individuals actually received the EITC. OBRA90 prohibited the counting of the EITC as income or as a resource in the month received or in the following month when determining eligibility for AFDC, Medicaid, food stamps, SSI, and low-income housing benefits. Finally, the 1993 Mickey Leland Hunger Act prohibited counting the EITC for the first 12 months after

receipt for food stamp benefits and eligibility. Beyond these time intervals, the EITC could cause potential recipients to fail program asset tests.

With the abolition of AFDC, it is not yet clear how the EITC will interact with state TANF programs. There are two major issues. First, States now have the authority to count the EITC as income when determining eligibility for their welfare programs. Second, many TANF programs contain employer subsidies and other job-related activities, which may or may not trigger tax obligations and potential EITC payments. The 1997 budget bill made clear that the EITC could not be claimed on income that results from "community service" and "work experience" jobs funded under TANF. Other situations will be judged by their "facts and circumstances" under the general welfare doctrine.[15] The law has not yet been well developed in this area.

Quality Control and Noncompliance

Compared to alternative delivery mechanisms, the EITC is inexpensive to administer. Most EITC recipients would be required to file a tax return even in the absence of the credit, so the marginal cost of obtaining the EITC is simply the small cost of filling out Schedule EIC. The cost to the IRS is also quite small. The entire IRS budget is roughly $8 billion and the IRS serves roughly 120 million individual taxpayers and 15 million corporations. The incremental cost of administering the EITC is surely a very small fraction of this total. The costs of administering two other major income support programs for low-income families are much higher. Administrative costs in FY1995 were $3.7 billion for food stamps and $3.5 billion for AFDC, though a significant portion of those costs also paid for client services.

While a system based largely on self assessment (like the U.S. income tax) will have lower

[15]A loose description of the general welfare doctrine is that if payments are made for the general welfare, meaning payments are public support for a disadvantaged family, they are not taxable and do not trigger the EITC. If payments are more job-related, they are less likely to be viewed is payments made to support the general welfare and more like compensation for services rendered. In this case they would be taxable and trigger the EITC.

administrative costs than a more bureaucratic approach, it will also have higher noncompliance. The most recent study of EITC noncompliance examined returns filed in 1995 (for tax year 1994) and found that of the $17.2 billion claimed in EITC, $4.4 billion, or 25.8 percent of the total exceeded the amount to which taxpayers were eligible (Internal Revenue Service, 1997).[16]

McCubbin (1999) shows that of the $4.4 billion in erroneous claims, $3.1 billion arise because of qualifying child errors.[17] Of these qualifying child errors, $1.7 billion arise because EITC qualifying children fail to live with the taxpayer that is claiming the child for at least six months (12 months if the qualifying child is a foster child). Mistakes of this type can run the gamut from innocent taxpayers running afoul of complex IRS rules to fraud. Consider, for example, a divorced couple where the divorce agreement gives the dependency exemption to the noncustodial parent, who in turn is regularly paying child support. Since the noncustodial parent receives the dependency exemption, he or she could easily assume they could also use the child to receive the EITC if they are otherwise qualified. But in this case the claim would be inappropriate, since the child does not live with the claimant for more than six months. In the category of clearly noncompliant, consider the situation described in the ethnographic study of Romich and Weisner (1999). They write, "... one women relies on her mother to baby-sit her younger daughter every weekend. The grandmother also buys school clothes for the child. In return for this care, the grandmother 'gets hers back at the end of the year' by (illegally) filing the child as her dependent and receiving an EITC" (page 19).

The two other major sources of qualifying child errors arise with the AGI tiebreaker ($0.78

[16] IRS enforcement practices in place during the 1995 filing season would have reduced the estimated net overclaim rate to 23.5 percent. If the IRS had been able to treat a taxpayer's failure to provide valid social security numbers of EITC qualifying children over the age one as a mathematical error on 1994 returns, the net overclaim estimate would have been 20.7 percent (Scholz, 1997).

[17] Also see Scholz (1997) and U.S. General Accounting Office (1998) for additional discussion of the 1994 tax year compliance study and Holtzblatt (1991) for one of the earliest discussions of EITC compliance issues.

billion) and relationship ($0.56 billion) rules. The AGI tiebreaker rule stipulates that if two people could legitimately claim the same EITC qualifying child (such as a mother and grandmother in the same house), the one with the highest income is supposed to. Something like a tiebreaker rule is necessary, to establish legitimacy in cases where more than one taxpayer claims the credit based on the same child. But it can lead to outcomes, where, for example, a parent that is living and caring for a child cannot claim the child because the child's grandparent lives in the house and has a higher income. The relationship test is violated when the person claiming the EITC qualifying child is not the child's parent (including the parent of an adopted child, step-child or foster child) or grandparent.

The other major source of EITC errors (accounting for $1.4 billion) arose in situations where the taxpayer's filing status was misreported. Like other sources of error, these can range from the innocent to obnoxious. For example, the custodial parent in a married couple that separates but does not get a divorce should, in some cases, file a joint or married filing separate return rather than file as a head of household, where they may be more likely to be eligible for the credit.[18] It seems likely that only the savviest taxpayers would understand these rules. Alternatively, a married couple living together may choose to file two separate tax returns (perhaps two head of household returns, or one head of household and one single return), strategically splitting their incomes and children to maximize the EITC.

There have been several technical changes made to the EITC since 1994 that should have modest, beneficial effects on EITC compliance. The most important changes require taxpayers to provide the social security numbers of all dependents and EITC qualifying children (starting in 1997), provides new resources for IRS enforcement and EITC-related educational efforts (for

[18]See Holtzblatt and Rebelein, (1999, page 8) for a discussion of the "abandoned spouses" rules.

both taxpayers and paid preparers), and provides the IRS with greater ability to deny certain questionable EITC claims before the credit is paid out.[19] As part of the 1997 Budget Agreement, the groundwork was put into place for a potentially more far-reaching compliance initiative. Specifically, Congress directed the Secretaries of Treasury and Health and Human Services to jointly use the Federal Case Registry (FCR) of Child Support orders to improve the accuracy of EITC claims. Forty-eight states are now reporting information to the FCR, typically identifying a child, the custodial parent and a noncustodial parent.[20] Since a large fraction of EITC errors arise in cases where someone other than the person living with the child is claiming the child for the purposes of the EITC, the FCR has the potential to allow the IRS to identify a substantial number of noncompliant cases, where previously they had no useful information. It is too early to know whether the FCR's apparent potential can be realized.[21]

The rate of EITC noncompliance appears higher than the overall U.S. tax gap, where it is estimated that 17 percent of total taxes are not paid (Internal Revenue Service, 1996).[22] While compliance appears to be very high for wage and salary income, presumably because of third-party information reporting, compliance rates on self-employment income, sales of business property, certain types of capital income and income earned in the informal sector are comparable and in some cases, far worse than EITC compliance rates.

[19]Specifically, the IRS was given authority to treat returns with missing or erroneous social security numbers as "mathematical errors," and hence not pay out EITC claims until these errors are resolved.

[20]Congressional Testimony by Olivia Golden, Assistant Secretary of HHS before the House Ways and Means Subcommittee on Human Resources, September 23, 1999.

[21]While the Federal Case Registry would appear to be a promising compliance tool, the data in the registry could be low quality; living arrangements could be fluid, making the FCR data insufficiently up-to-date; or it could be infeasible or inefficient (from a cost-benefit standpoint) to use FCR data during processing to stop questionable refund claims before money is paid out. Once inappropriate EITC claims are paid out, it is very difficult to get the money back.

[22] There is some question about the reliability of the tax gap estimates since the underlying data are from 1988.

III. Program Statistics

Table 3 provides information on the maximum real EITC benefit (in 1999 dollars) over time, real expenditures, and caseloads since the credit was established in 1975. For the first 16 years of the credit, the real value of the maximum EITC never exceeded its 1975 value by more than $10. Real spending on the credit increased sharply starting with the 1986 EITC expansion. Prior to 1986, the EITC cost between $2.6 and $4.7 billion. The 1986 expansion roughly doubled total spending on the credit by increasing the maximum credit (to make up for the loss in the value of the credit due to inflation), indexing the credit, and extending its phase-out range. The credit rate, maximum credit and spending increased every year from 1990 through 1996 as a consequence of the three-year phase-ins of the 1990 and 1993 EITC increases. Real EITC spending more than tripled in the 1990s.

The evolution of the number of EITC claimants shown in Table 3 closely mirrors the changes in EITC statutes and, to a lesser extent, business cycle changes. Between 5.2 and 7.4 million taxpayers claimed the credit between 1975 and 1986. By extending EITC eligibility to taxpayers with incomes up to an indexed level of $18,576 in 1988, the 1986 EITC changes increased the number of EITC recipients by roughly 50 percent. The phased-in 1990 expansions also modestly increased the income thresholds that determine EITC eligibility, so the number of recipients increased by roughly 1 million per year from 1990-93. The number of recipients increased by roughly 4 million claimants as a consequence of the childless worker credit that was available for the first time in 1994. The number of EITC claimants has been constant since 1995, despite the increasing labor force participation rate of single parent families, possibly in part due to increased compliance efforts.

Though the evidence is now somewhat dated, it appears that the EITC reaches a large

percentage of its intended beneficiaries. Scholz (1994) used matched data from tax returns and the SIPP to calculate that 80 to 86 percent of taxpayers eligible for the EITC appeared to receive it in 1990.[23] Developments since 1990 have an ambiguous effect on EITC participation rates. The maximum credit has increased sharply since then, from $1,207 to $3,756 in 1999 dollars, and the credit extends further up in the income distribution, where filing propensities are high. There have also been expanded outreach efforts by the IRS, state agencies and non-profit organizations. However, there has been a steady increase in labor force participation of single women with children (Meyer and Rosenbaum, 1999a, 1999b), and new workers in this group presumably have lower filing propensities than the typical worker in the population. Hotz, Hill, Mullin and Scholz (1999), for example, suggest that EITC participation rates for single mothers who recently had been on AFDC in California were in the range of 42 to 54 percent in 1993 and 1994. In addition, the IRS no longer will intervene and award the credit when taxpayers file and appear eligible, but do not take the credit (they did this until the early 1990s). Instead they send a letter to taxpayers encouraging them to consider filing an amended return. EITC compliance efforts may also have discouraged some eligible taxpayers from claiming the credit.

Given the large expansions of the credit in the 1990s and changes in low-wage labor markets documented by Meyer and Rosenbaum (1999a, 1999b) and others, it would be very useful to see solid, updated EITC participation rate calculations. Conducting such a study is difficult, however, since no single data set has the information necessary to determine the population of eligible taxpayers and simultaneously determine who filed a tax return and received the EITC.

Liebman (1999a) uses matched data from the 1990 Current Population Survey and tax

[23]Blumenthal, Erard, and Ho (1999) present similar participation rates for 1988 making use of detailed audit data from the 1988 Taxpayer Compliance Measurement Program.

returns to examine the characteristics of EITC-eligible taxpayers. He writes

> "50 percent of eligible 1990 EITC taxpayers are married, while 30 percent are formerly married, and 20 percent have never been married. A little more than half are white, a quarter are Black, and 18 percent are Hispanic. 74 percent of eligible EITC recipients have a high school education or less; 44 percent live in the South; and 36 percent live in a central city. 58 percent work 1500 hours or more, though married couples in which one spouse does not work bring down this average. 16 percent of eligible EITC tax returns are filed by individuals in households that receive welfare income during the year and 26 percent are in households receiving food stamps" (page 20).

Just as the net effect of trends in EITC participation since 1990 are difficult to predict, it is also difficult to predict how the characteristics of EITC participants have evolved. The income threshold at which the EITC is fully phased out has increased to roughly $30,000 from $20,000 (nominal) dollars since 1990, and many taxpayers have incomes in that range, so it is likely that EITC recipients appear somewhat more affluent than what Liebman found. At the same time, labor force participation rates of single women with children have increased over this period, and many of these new workers have low levels of human capital.

Antipoverty effects, target efficiency, distributional impact

By its structure, the EITC is limited in 1999 to taxpayers with earned income and adjusted gross income less than $30,580 if they have more than one qualifying child, $26,928 if they have one qualifying child, and $10,200 if they have no qualifying children. Given the distribution of families filing tax returns, more than half of EITC payments go to families with incomes above the poverty line.[24] Scholz and Levine (2000), for example, calculate that over 60 percent of EITC payments go to taxpayers with pre-EITC incomes below the poverty line and roughly half of total payments directly reduce the poverty gap. Liebman (1997a) plots density functions for

[24]The HHS poverty guidelines for 1999 are $8,240 for a one person family, $11,060 for two-person families, $13,880 for three person families, and $16,700 for four-person families.

EITC payments following the 1993 expansion that show a right-skewed distribution, centered at roughly $13,000, with most payments going to families with incomes between $7,000 and $26,000.[25]

Figure 3 presents data from 1997 tax returns on the distribution of EITC returns and payments by adjusted gross income class for EITC claimants with children. Roughly 23.3 percent of EITC claimants are in the phase-in range of the credit and they receive 22.3 percent of total payments. Roughly 18.2 percent are in the flat range and they receive 26.4 percent of total payments. The remaining 58.3 percent of claimants are in the phase-out range of the credit. They receive 51.3 percent of total payments.

Because the EITC is based on annual family income and not wages, it is possible that people with high hourly wages who for some reason or another, choose to work relatively few annual hours could receive the credit. In fact, the evidence suggests that in low-wage labor markets, incomes and wages are tightly linked. Scholz (1996) describes tabulations from the Survey of Income and Program Participation (SIPP) showing that roughly two-thirds of EITC payments go to taxpayers with wages in the bottom 25 percentile of all workers with children (below $6.43 per hour) and more than 95 percent of all EITC benefits are paid to workers with wages below the median of $9.42 per hour. Liebman (1997a) reports that in 1990, 75 percent of EITC recipients worked at least 1,000 hours and 60 percent worked more than 1,500 hours per year. Incomes and wages are now even more tightly linked for EITC recipients since EITC-eligible taxpayers cannot have more than $2,350 of capital (and net capital gains) income.

Liebman (1997a) also presents calculations that provide an interesting perspective on the importance of the EITC in low-wage labor markets. Between 1976 and 1996, the share of

[25] Liebman (1999a) notes that a household may have more than one tax filing unit, so household income can be larger than income reported on a tax return.

income received by the lowest fifth of the population fell to 3.7 percent from 4.4 percent. The share received by the top 5 percent increased to 21.4 percent from 16.0 percent over that period. Liebman's calculations show that for households with children, the EITC offsets 29 percent of the decline in incomes in the first quintile of the population and 9 percent of the decline in the second quintile. A more direct measure of the EITC's importance is that in 1997 and 1998 it removed 4.3 million persons from poverty (Council of Economic Advisors, 1998, 2000).

IV. Review of Behavioral Issues

In this section we consider several conceptual issues related to the behavioral effects of the EITC.

Program Participation: Claiming the EITC

Perhaps the most basic behavioral issue associated with the EITC is whether *eligible* taxpayers actually file tax returns to receive it. At first glance the analytic underpinnings of this decision appear straightforward: the benefit of filing for the credit is the dollar value of the EITC. The costs include the transactions costs associated with filing a return (for those who would not otherwise file) and gathering the necessary information to claim the EITC (or resources to pay a professional tax preparer). These cost-benefit considerations lead to straightforward implications. Claiming the credit is more likely the larger the potential credit and the greater that filer's familiarity with the tax system and with English.

From the work of Holtzblatt (1991), McCubbin (1999), and others, however, we know that a significant fraction of taxpayers receive the EITC when they are not technically eligible. Thus, a focus on participation among eligibles may, in some circumstances, be too narrow. For policymakers and scholars interested in overall EITC participation, participation and compliance issues are intertwined. Even when thinking about participation of eligibles, participation and

compliance are linked, since legitimate current year claims, for example, may lead to scrutiny of past tax returns or the possibility that funds may be garnished to cover defaulted student loans, past taxes or child support.

Compliance issues can usefully be thought of in the classic tax evasion framework of Allingham and Sandmo (1972). Taxpayers will adopt an optimal reporting strategy, weighing the tradeoff between the return to misreporting a dollar of income and the corresponding increased risks of detection and penalty. Interestingly for the case of the EITC, some taxpayers may prosper by *overreporting* income, a situation the IRS has little experience with.[26] Also, unlike the classic tax evasion model that focuses on income reporting, a central issue with EITC noncompliance has to do with the residence of the qualifying child. The IRS (until perhaps recently) has had little information with which to examine these claims.

The Decision to Work and Hours of Work

As noted in both the introduction and political history of the EITC, one of the arguments frequently used in support of the EITC is that it provides stronger work incentives than the negative income tax or entitlement programs like AFDC, food stamps and Medicaid. This assessment, while true in a comparative sense, obscures a complicated set of work and labor supply incentives created by the EITC for different household structures and individuals at different parts of the income distribution. As a result of these complicated incentives, the overall effect of the EITC on hours of work is ambiguous.

The simplest framework in which to consider the work incentive effects of the EITC is the static labor-leisure model that is displayed in Figure 4. In this stylized setting, the EITC creates, for eligible households, an expanded budget constraint, shifting out the constraint from *ade* to

[26]Steurele (1991) has referred to this phenomenon as the "superterranean economy."

abcde. The phase-in region is represented by the segment *ab*, the flat region by *bc* and the phase-out region by *cd*. Consider the implications for individuals who do not work, whose well-being is indexed by utility level, U_0^I, in the absence of the EITC. As illustrated in Figure 4, the introduction of the EITC induces such individuals to enter the labor force and work, and their utility increases to U_1^I from U_0^I. The EITC creates an incentive for these non-workers to enter the labor force since it increases the marginal value of working by raising the effective wage. More formally, the rise in the effective wage rate due to the EITC for individuals initially out of the labor force results in only a positive substitution effect and no income effect.

Figure 4 also displays preferences for two additional types of individuals, indexed by *II* and *III*, who, in the absence of the EITC (or other social programs), would participate in the labor force. As one can see, the introduction of an EITC program does not alter their decision to work. Thus, the incentive effects of the EITC with respect to labor force participation are unambiguously positive: the EITC will encourage some workers to enter the labor force and should not induce individuals, low-skilled or otherwise, to leave the labor force. This result stands in contrast to the labor force participation predictions that arise with programs related to the negative income tax (like AFDC), where a guaranteed benefit at zero hours of work creates incentives for some people to leave the labor force.

At the same time, the predicted effect of an EITC of the simple static labor-leisure model on the *extent* of work, i.e., number of hours of work, is ambiguous. As Figure 4 illustrates, this is because of the differential effects that the EITC has in its flat and phase-out regions. The EITC structure implies different marginal returns to work (i.e., effective marginal wage rates) for different parts of the pre-program income distribution. For Type *II* individuals, who would participate in the labor force in the absence of the EITC, the introduction of the EITC does not

change the value of their time in the labor market, but only alters the income they can receive through the tax credit. As such, there is only an income effect associated with the introduction of the EITC for Type *II* individuals. Whether this income effect is negative (leisure is a normal good) or positive is not clear *a priori*. The empirical evidence on income effects suggest that leisure is a normal good, so, as illustrated in Figure 4, the EITC may result in a reduction of hours of work for this type of individual.

The phase-out region of the EITC is relevant for the Type *III* individuals in Figure 4. These individuals, as drawn, have an incentive to reduce their hours of work enough so that they actually receive a credit. This final case illustrates the potentially negative effect on hours that is generated in the phase-out region of the EITC. There the EITC implies a *lower* effective wage rate relative to the absence of the EITC, which, by itself, results in a negative substitution effect. In addition, there is an income effect that, if negative, will lead to a further reduction in hours of work.

The above considerations suggest that the consequences of the EITC expansions for affecting the work behavior of low-income workers are complicated. In particular, the labor market effects of the credit depend on the distribution of taxpayers within the credit's ranges and the degree to which people in and out of the labor market respond to incentives. On the former issue, as noted earlier, around 77 percent of EITC recipients will have incomes that fall in the flat or phase-out range of the credit, which raises the concern that the EITC may lead to a net reduction in the labor supplied by low-income workers. The latter issue concerning the responsiveness to the "effective" wage and income changes associated with the EITC expansions also cannot be resolved *a priori*. It is an empirical matter. Below, we discuss the empirical evidence to date on the magnitudes of these effects.

Our simple model in Figure 4 focuses on the behavioral effects for individuals and ignores an important feature of the U.S. tax code applicable to the EITC. *Married* couples generally file joint tax returns and, thus, adjusted gross income (AGI) subject to taxes depends on the combined and not the separate incomes of each spouse. The fact that families are the unit of analysis for the tax system rather than individuals has consequences for the effective wage rates of secondary earners, which is an issue made even more important by the EITC. To see this, consider the following example discussed in Eissa and Hoynes (1998).

Suppose that the husband earns $11,650 (in 1997) and that the couple makes its time allocation decisions sequentially, with the wife taking actions under the assumption that her husband's income is given. In this case, the family will receive the maximum credit of $3,656 (assuming the couple has 2 children) if the wife does not participate in the labor force. If she does participate, the family's credit, at the margin, will be reduced by $0.21 and that dollar will be subject to the social security payroll tax of $0.142 percent and any state taxes. As such, her marginal tax rate is at least 35 percent, i.e., her effective wage rate will be only 65 percent of her gross wage rate. This lowering of the wife's effective wage that results from the joint filing requirement provides an incentive for the wife *not* to participate in the labor force, even though the presence of an EITC might induce her husband to enter the labor force. Furthermore, if she works, she has an incentive to reduce her hours of work in the presence of the EITC (compared to no EITC) due to lowering of her effective wage (inducing a substitution effect) and to the higher income the family receives from the EITC (inducing an income effect). Note that ambiguous effect of the EITC on the labor force participation choice of one of the spouses does not hinge on the sequential decision-making assumption noted above. Under a more general model of joint decision-making, the greater the disparity in the gross wage rates and/or tastes for

non-work time across spouses, the greater the incentive for an expansion of the EITC to induce one of the spouses to *not* participate in the labor force. Again, the importance of this potential work disincentive effect of the EITC depends on the magnitudes of the labor supply and labor force participation wage elasticities of husbands and wives, the degree to which people correctly perceive tax incentives, and on the distributions of their wage rates relative to the phase-in, flat and phase-out regions of the EITC. We examine empirical evidence on the labor force participation and labor supply effects of the EITC for married couples below.

Marriage and Fertility

The previous discussion of the potential for differential effects of the EITC by marital status raises an important issue about the potential effects of the EITC on family structure. As noted above, the tax treatment of married couples is different from that of single parents or individuals, which leads to situations where a married couple may face larger total tax liabilities than they would pay if they split. Similarly, two unmarried people may pay lower taxes than they would if they got married. This is the well known "marriage penalty" that has been the focus of attention in the public finance literature and policy circles.[27] In practice marriage penalties tend to accrue to two-earner couples where both partners have similar earnings, and marriage bonuses tend to accrue to couples where the partners have disparate earnings or only one earner. Two recent studies have suggested that the EITC and its expansions over the last 10 years are an important contributing source of the marriage penalty.[28] For example, Holtzblatt and Rebelein (1999) estimate that the EITC will increase the net marriage penalties in the individual income tax by between $3.6 and $9.9 billion in 2000, depending on the specific assumptions, and that these

[27]See Feenberg and Rosen (1995), Alm and Whittington (1995), Congressional Budget Office (1997), Bull et al. (1999). The general statement of the problem is that the tax system cannot simultaneously be progressive, treat the family as the unit of taxation, and be neutral with respect to marriage.

[28]See Dickert-Conlin and Houser (1998) and Holtzblatt and Rebelein (1999).

EITC-related net penalties account for 10.0 to 31.7 percent of the total, net projected marriage penalties.

A natural question to ask is whether changes in the EITC are likely to affect rates of marriage and divorce among the poor. That is, the EITC, by providing resources to families with children, may decrease the incentive for single parents to marry. The credit also provides fairly substantial incentives for some people to marry and others to separate or not marry. This potential for the influence of the EITC on marital status is reminiscent of the concerns about the effects of other public assistance programs, most notably the AFDC program, on marriage and the incidence of female headship.[29] To date, much less attention has been paid in the literature to the impacts of the EITC on marital status compared to those of other assistance programs.

A related question arises as to whether the structure of the EITC also may affect the fertility decisions of households. As noted in Section II, the EITC was, prior to 1991, only available to families with children, and even now, the maximum credit available to families with children is much larger than that available to childless taxpayers. In addition, households with two or more children were able to claim a higher EITC than households with only one child, again starting in 1991. Both of these EITC features constitute a modest pro-natalist incentive for taxpayers. There is a substantial literature that examines the effects of AFDC on fertility, especially on out-of-wedlock births.[30] Furthermore, studies have found non-negligible effects of provisions of the tax code, namely the presence and generosity of the dependent exemptions, on fertility or the timing of birth.[31]

There is no direct empirical evidence on whether EITC fertility incentives have actually

[29] See Moffitt (1998) for a discussion of this issue and a summary of the empirical evidence on it.

[30] Again, see Moffitt (1998) for a summary of that literature and its findings.

[31] See Whittington, Alm and Peters (1990) and Dickert-Conlin and Chandra (1999).

influenced behavior. The question, however, is important for two reasons. First, the effects of policy on fertility are of general interest as part of an effort to assess the potential for unintended consequences of tax policy. Second, many of the methods used by researchers to isolate the effects of the EITC on other behaviors, especially labor supply, hinge crucially on the assumption that the EITC expansions have had no effects on the fertility of couples. We return to this issue below.

Consumption Behavior and Income Smoothing

The fundamental tenant of the life-cycle model is that utility-maximizing households will equate the marginal utility of consumption across periods. To do this families typically save in periods when income is unusually high and borrow when incomes are unusually low. EITC-eligible families relative to other taxpayers generally have lower incomes and are younger (because they have children). Thus, one would generally expect EITC-eligible households to include many that would like to borrow.

There is evidence, however, that some families in the economy who would like to borrow are unable to do so.[32] For these liquidity-constrained families, the EITC could enhance utility more than it would for an otherwise equivalent consumer who was not liquidity constrained. The EITC advance payment option might seem like a particularly important feature for credit-constrained taxpayers. By delivering a portion of the EITC incrementally with every paycheck, families presumably have an enhanced ability to smooth the marginal utility of consumption.[33]

[32]Jappelli (1990) looks at direct measures from the 1983 Survey of Consumer Finances and finds that roughly 20 percent of the population appears to be constrained. Also see Jappelli, Pischke and Souleles (1998).

[33]Taxpayers can receive a portion of their EITC incrementally throughout the year via the advance payment option. They do this by filing Form W-5 with their employer, who then includes the advance payment in their regular paycheck (the employer is held harmless as they reduce payroll tax remittances to the government). In order to reduce the possibility that advanced EITC payments will lead to an end-of-year tax liability, advance payments are limited to 60 percent of the maximum credit available to families with one child. Taxpayers receiving the advance payment are obligated to file at the end of the year to reconcile their tax liabilities.

As we discuss below, however, a very small fraction of EITC recipients take advantage of the advance payment option, though "refund anticipation loans" (with very high implied interest rates) are popular.

Further evidence of credit constraints among the EITC-eligible population might be inferred from unusual patterns of seasonality in consumption. In particular, most EITC payments are received in February and March of each year (Barrow and McGranahan, 2000). Since these payments can be a large fraction of a family's quarterly income, one might expect to see a corresponding increase in consumption for credit-constrained families. Souleles (1999), for example, presents evidence based on consumption Euler equations for the entire population that is consistent with tax refunds influencing the seasonality of consumption, which is consistent with the existence of liquidity constrained consumers.

Consumption-related issues also arise if one steps away from the canonical life-cycle model of consumption. Thaler (1994) and others have argued that self-control problems are pervasive in the economy. If rules of thumb, habit, innumeracy, or other psychological factors have a dominant influence on economic behavior, the forward-looking model of utility maximizing consumers may not do a particularly good job characterizing economic behavior. In this case, it is possible that self-control problems or other factors prevent families from accumulating resources that might allow them to enhance their long-run economic well-being. The lump-sum EITC may therefore provide a substantial one-time payment that can be used to purchase a car, enhance human capital or move out of a lousy neighborhood and in doing so break a cycle of economic deprivation. Needless to say, however, it is difficult to develop and test rigorous formulations of non-optimizing consumption behavior.

V. Review of Evidence on the Behavioral Effects of the EITC

In this section, we summarize the empirical evidence concerning the effects of changes in the EITC on a range of behavioral outcomes. We begin by discussing empirical estimates of the effects of the EITC on takeup (or EITC participation). Then given their centrality to the empirical literature on the EITC, we discuss identification issues that arise in studies of the EITC and labor market behavior. We then summarize the existing empirical studies of labor force participation, hours of work, marriage and living arrangements, human capital investment decisions and consumption decisions. We also comment on existing shortfalls in what is known about these behavioral effects and issues that need to be addressed in future research.

Evidence on EITC participation and noncompliance

It would be helpful to policymakers to know what fraction of EITC nonparticipation (among eligible taxpayers) is due to information barriers and what fraction is due to purposeful nonparticipation. The decision of individuals or households to participate in the EITC entails at least two potential choices. First, one or more adults in a household must choose to work for pay (i.e., have earned income) with earnings not greater than the EITC threshold and, until recently, must have qualifying children in order to be eligible for claiming the EITC. Meeting these criteria, households must then choose to file a tax return in order to claim the EITC. The optimizing model of the sort outlined in Section IV implies that the decision to participate in the EITC is based on whether their utility-maximizing hours of work choice is such that earned income falls in either the phase-in, flat or phase-out regions of the budget constraint. As we discuss below, filing a tax return may be a distinct choice.

As mentioned in Section IV, there are only two studies of EITC participation among eligibles, Scholz (1994) for 1990 and Blumenthal, Erard and Ho (1999) for tax year 1988.

Neither study models of the EITC participation decision based a formal optimizing model. Scholz (1994) presents reduced form regressions of factors correlated with nonparticipation. He found some evidence, based on his analysis of linked data from the 1990 Survey of Income and Program Participation and tax returns, that factors like working in the household service sector or being eligible for a small EITC were positively correlated with not claiming the credit when eligible. The question is still open, however, about the degree to which EITC participation can be increased by additional outreach and information.

Formally modeling the decision to claim the EITC will require one to grapple jointly with several information and noncompliance issues. There is mixed anecdotal evidence on the degree to which taxpayers are aware of the EITC. Liebman (1997a) suggests that awareness of the credit might be quite low, based on interviews he (along with Nada Eissa) conducted in Cambridge, Massachusetts in 1993, his experience as a VITA volunteer in 1994, and more recently in interviews with recipients of subsidized housing. Smeeding, Ross-Philips and O'Connor (1999), argue "there is growing recognition of the EITC program and its potential payoff for working households" based on their analysis of a sample of low-income households that use free tax services provided by the Center for Law and Human Services (CLHS) in Chicago. They found 83 percent of their sample expected a refund when they went to CLHS and among those, about one-third were familiar with the EITC. Romich and Weisner's (1999) ethnographic study of 42 Milwaukee families also found that most in the sample had heard of the EITC, but the sample was drawn from participants in a welfare reform project (Project New Hope), and consequently may have learned of the credit through New Hope services.

The degree of awareness of the credit is critical for some issues and less important for others. The credit could, for example, significantly increase labor force participation even if

people know little about it as long as workers have some understanding that the tax system rewards work at low levels of earnings. The link between the marginal incentives of the credit shown in Figure 2 and the labor supply decisions discussed in Figure 4 depend on people understanding the specific incentives inherent in the credit's structure. Given the lag between labor market decisions and receipt of the credit, which can be as many as 16 months, informational considerations suggest that the credit's effect on participation may be larger than its effect on hours, compared to a world where taxpayers have perfect knowledge of the credit.

Informational issues are probably less fundamental when thinking about EITC participation among taxpayers eligible for the credit. Scholz (1997) reports that roughly 95 percent of EITC claimants are either legally required to file tax returns or would file to recover over-withheld taxes, so most eligible taxpayers would get into the system even in the absence of the EITC. In 1996, 56.5 percent of claimants use paid tax preparers, who surely are aware of the credit. The IRS also has a policy to notify all taxpayers who do not claim the credit but appear to be eligible for it based on their filing information, that they may be eligible and can file an amended return to receive the credit.

Behavioral work on overall EITC participation and noncompliance must take into consideration three central facts. First, there appears to be little scope for overstating EITC claims by systematic, ongoing misreporting of wage and salary income. The IRS, using information returns filed by employers, can in principal corroborate wage and salary reports.[34]

Second, there would appear to be ample opportunities to misreport self-employment income

[34] The Internal Revenue Service (1996) reports that, in aggregate, net underreporting percentages on wage and salary income were 0.9 percent, lower than any items other than state tax refunds (at 0.8 percent). EITC-related wage and salary errors can still occur as claimants may not realize that employers provide independent information to the IRS, they may unintentionally omit a Form W-2 for a second job, they may wish to use the IRS as a "loan shark" for the period between submitting a claim and being audited (Andreoni, 1992), or they may wish to take the chance that the IRS will be unable to recover money once it is paid out (and spent).

to strategically manipulate the size of the available EITC, since there is no information reporting on most forms of self-employment income. According to McCubbin's (1999) work with the most recent IRS EITC audit study, however, only 10 percent of the EITC overclaims in 1994 involved returns with income errors, and only roughly half of those had to do with self-employment income. In addition, only 17.6 percent of all EITC filers claim any self-employment income and 54.3 percent of those reporting self-employment income have incomes in the phase-out range of the credit (Internal Revenue Service, 1999), so it is clear that strategic misreporting of self-employment income is not currently a dominant feature of EITC noncompliance. Finally, the lack of transparency of the EITC incentives may also hinder efforts to strategically manipulate self-employment income. Would-be tax cheats need to be sophisticated enough to *overstate* self-employment income in the phase-in range of the credit or *understate* self-employment income in the phase-out range to be effective.

Third, as pointed out by Liebman (1997a), Liebman (1999a) and McCubbin (1999) among others, the major area of EITC noncompliance (particularly participation by ineligibles) has to do with qualifying child errors. This is a particularly difficult area for the IRS to enforce, since information on children (beyond ages and social security numbers) is not collected in the tax system.[35] Liebman (1997b) develops the following intuitive idea: if noncompliance is inadvertent, it should not respond to the size of the available credit. He examines this by looking at whether the probability of erroneously claiming a dependent child depends on the tax gain to such a claim (McCubbin, 1999, pursues a similar strategy). He estimates that roughly one-third

[35] While there is some evidence that error rates are high for certain subgroups – for example, Liebman (1999a) reports that roughly one-third of male heads of households did not appear to have children in matched CPS data – audits are expensive so "hit rates" need to be much higher than 1 in 3 for compliance initiatives to pass any sensible cost-benefit test, even if the IRS were willing to pursue a gender-based compliance strategy. The U.S. General Accounting Office (2000), for example, reports that 86 percent of EITC claims selected for audit in fiscal year 1999 were found to be invalid.

of ineligible claimants in 1988 did so in response to the EITC incentive.

Good compliance studies will be difficult to conduct outside of Treasury, the IRS or Census because of data access limitations. An interesting question that is on the table for public servants and affiliated scholars at these agencies is whether data gathered for one purpose – for example, administering child support laws – could be useful in reducing erroneous EITC claims. To be useful for tax administration, research is needed to find ways to identify erroneous payments before money goes out, since once payments are made they are rarely recovered. In addition, the IRS has limited resources, so research is also needed on the cost effectiveness of alternative ways of improving compliance, both focusing on the EITC and the broader tax system. While EITC compliance has received considerable scrutiny in recent years, comparable work on other areas of the tax code is badly dated or nonexistent.

New studies that document changes in EITC participation rates of eligible taxpayers in the late 1990s are needed given the sharp changes in the credit over the decade and structure of low-wage labor markets. Greater detail on the characteristics of non-participants would also be useful, both for outreach and for understanding linkages between programs. Doing these studies is straightforward, though to do them, data rich enough to determine eligibility need to be linked with data that indicate whether or not a potentially eligible taxpayer files a return and receives the credit.

Econometric Methods Used for Identifying Behavioral Effects of the EITC and it Labor Market Effects

In this section, we outline the econometric approaches that have been used to identify the effects of the EITC on labor market outcomes, and, in some cases, the related literatures on the effects of tax and social program reform. Much of this literature on the effects of the EITC has sought to answer the following question: What has been the effects of historical changes in the

EITC on particular behaviors, e.g., labor force participation or hours of work, for certain types of households in the population? In essence, the objective of this line of research has been to determine the overall (or "reduced form") effects of a particular expansion on some particular behavior. We first discuss the approaches used to identify these reduced form effects.

We then consider what we shall refer to as "quasi-structural" models. While the assumptions required to identify parameters of interest in these models are not fundamentally different from those used in the analyses of the overall impacts of the EITC on behavioral outcomes, the focus of this second set of models is on parameters associated with relationships implied by optimizing models, e.g., wage and income effects associated with labor supply equations, or the effects of the EITC as it operates through effects on after-tax wage rates and income.

Finally, we briefly describe what can be referred to as "structural" models, in which the parameters of interest are ones that directly characterize the preferences functions and constraints in optimizing models of consumer choice. The discussion of each of these approaches is followed by a summary of the empirical studies that rely on these classes of models, paying particular attention to the estimation of labor force participation and labor supply decisions. Many of the issues we consider apply to the estimation of the effects of the EITC on other behaviors.

Identification and Studies of the Overall Effect of the EITC

Estimating the reduced form effects of the EITC typically exploit the historical expansions in the EITC discussed above to isolate and assess the overall impacts of these expansions on behavior. Exploiting this source of variation is a time-honored strategy in policy analysis and applied economics. It is commonly referred to as the "natural experiments" or "difference-in-

differences" approach.[36] To understand the variation exploited by this approach and what it identifies, consider the following framework. Suppose we are interested in estimating the effect of a policy (or bundle of policies) on some outcome, y. A natural experiment is deemed to be present if the policy changes from one time period to the next (or from one location to the next as in the case for programs like AFDC) and these effects vary as a function of individual characteristics. Drawing on the treatment-effects literature, let $d_t(Q_{it})$ denote some treatment that prevails in period t that is applicable to the i^{th} individual or household with characteristics Q_{it}. Note that d_t may represent a vector of policies – such as the credit rates associated with the various regions of the EITC, the maximum credit, or the earned income "boundaries" for the three credit regions – that prevail at t. In this case, the conditioning variables, Q_{it}, would consist of the individual or household attributes that determine which of the above parameters apply. For example, $d_t(Q_{it})$ might be the marginal tax rate applicable to the i^{th} household, based on the values of their observed (and chosen) income and number of children contained in Q_{it}.

In the context of analyzing the reduced form effects of the EITC expansions, the relevant definition of the treatment variable, $d_t(Q_{it})$, would be the following indicator variable

$$d_t(Q_{it}) = \begin{cases} 1 \text{ if individual } i \text{ is "eligible" for a policy reform that prevails in period t} \\ 0 \text{ otherwise} \end{cases}, \qquad (1)$$

where the conditioning variables in Q_{it} would include the number of children and family structure of the i^{th} household as of period t. Focusing, for now, on this definition of the treatment variable, consider the following linear specification of the determinants of behavioral outcomes, y_{it}, such as labor force participation or hours of work,

$$y_{it} = \beta d_t(Q_{it}) + \lambda_t X_{it} + \alpha_t + u_{it}, \qquad (2)$$

[36] The following discussion draws heavily on Moffitt and Wilhelm (forthcoming). Also see Blundell and MaCurdy (1999), Meyer (1995), and Angrist and Krueger (1999) for other discussions of approaches to estimating the effects of policy interventions.

where β is the overall effect of the policy change, X_{it} is a vector of individual and household characteristics that may include Q_{it}, u_{it} is an error term and λ_t and α_t are parameters to be estimated. To understand what is required to identify β, consider what would be learned if one could assign the values of $d_t(Q_{it})$ on a random basis. If this were the case, the data on individuals would be generated by a controlled experiment where some individuals (experimentals) would face a new policy regime ($d_t(Q_{it}) = 1$) and others (controls) would not have access to this new regime ($d_t(Q_{it}) = 0$). It would follow, by design, that $d_t(Q_{it})$ would be uncorrelated with (orthogonal to) u_{it} and, for that matter, to X_{it}. In this case, the standard conditions for consistently estimating the parameters in (2) would apply. In fact, in this case, the mean difference in outcomes for experimentals and controls would consistently estimate β.

In the absence of random assignment of individuals to policy regimes, we must rely on temporal changes (or, possibly, locational differences) in policies *and/or* variation in $d_t(Q_{it})$ due to variation individual differences in Q_{it}. However, these sources of variation, in general, are not sufficient for identifying β. For example, reliance only on the changes in the EITC over time to identify the credit's effect is confounded with other temporal changes in the economy (or environment) that may have influenced the labor supply of the low-income population. Thus, additional assumptions, in conjunction with the availability of certain types of data, are required in order to identify the effects of the EITC. Existing studies of the EITC, and studies of related tax and public assistance policy changes, make use of alternative data sources and assumptions. In the analysis of the reduced form effects of the EITC, the most common approach that has been employed is the differences-in-differences design.

To illustrate the difference-in-differences design, we consider the approach taken in several studies of the overall effect of various expansions of the EITC on the labor force participation

and hours of work of single mothers and of husbands and wives (Eissa and Liebman, 1995; and Eissa and Hoynes, 1998).[37] This design proceeds as follows. Suppose that d_t is defined as in (1) and assume that we have data, either repeated cross-section or panel data, on households for periods t'' and t', where t' denotes a period before an expansion in the EITC and t'' is a period after the expansion. Furthermore, recall that prior to 1994, the EITC required the presence of children in order to be eligible to claim the credit. Put another way, households without children, both *before* and *after* EITC expansions (such as occurred in 1986) were not eligible for the EITC, while households with children faced a change in the credit with the expansion. In this case Q_{it} can be represented as an indicator variable, where $Q_{it} = 1$ if children are present in household i and in period t and = 0 if not, and $d_t(0) = 0$ for t' and t''.

The difference-in-differences estimator of β exploits the temporal changes in policies, here the EITC expansions, and the nature of the role that Q_{it} plays distinguishing the temporal effects on y of the variation in policies. To see how this occurs, consider differencing equation (2) for periods t' and t'' for each individual/household:

$$y_{it''} - y_{it'} = \beta[d_{t''}(Q_{it''}) - d_{t'}(Q_{it'})] + \lambda_{t''}X_{it''} - \lambda_{t'}X_{it'} + (u_{it''} - u_{it'}). \quad (3)$$

The differencing in equation (3) requires panel data on the same individuals in the two time periods. If one's data is limited to repeated cross-section data on households in periods t' and t'', the analogous representation of (3) is:

$$y_{it} = \beta[d_{t''}(Q_{it''}) - d_{t'}(Q_{it'})]P_t + \beta d_{t'}(Q_{it'}) + [\lambda_{t''}X_{it''} - \lambda_{t'}X_{it'}]P_t + \lambda_{t'}X_{it'} + (u_{it''} - u_{it'})P_t + u_{it'}, \quad (4)$$

for $t = t'$, t'' and where $P_{it} = 1$ if $t = t''$ and 0 otherwise.

The validity of the difference-in-differences estimator for β relies on several additional

[37] Neumark and Wascher (2000) adopt a similar strategy, emphasizing the usefulness of variation generated by state-level EITCs to identify behavioral effects. This variation is someone limited in the years spanned by their data, however.

assumptions about Q_{it} and its effects on y in (2) that further restrict the above specification. The first concerns the nature of independent effects of Q_{it} on y. Recall that we allowed for the possibility that X_{it} includes Q_{it}. In the current context, this amounts to assuming that the presence of children affects the labor supply decisions of parents, an assumption consistent with various behavioral models of optimal time allocation.[38] The standard difference-in-difference estimator maintains the assumption that either Q_{it} is excluded from X_{it} or the less restrictive, but not innocuous, assumption that $\lambda_t = \lambda$, i.e., the effect of children on y does not vary with time. Second, the standard difference-in-difference estimator typically assumes that Q_{it} uncorrelated with u_{it} in (2). Note that strict exogeneity of Q_{it} in (2) is not required. The consistency of the difference-in-differences estimator holds under weaker assumptions, especially if one is willing to maintain that Q_{it} is a time-invariant variable. (See Moffitt and Wilhelm (forthcoming) for details.) Under these two sets of assumptions, the difference-in-differences estimator of β will be consistent.

Several of the studies of the effects of the EITC make use of the difference-in-difference estimator. Selected studies are summarized in Table 4, which describes their estimated impacts of the EITC, as well as the data sources and the estimation methods used. The difference-in-difference studies rely on explicit comparisons between groups that are and are not affected by changes in the EITC. Figure 5 plots trends in the labor force participation between 1984 and 1996 (from the March CPS, taken from Meyer and Rosenbaum, 1999b) for six groups in the population – including households with and without children – that are commonly used to examine the effects of the EITC. It is these trends that the difference-in-difference studies seek to explain.

[38] See, Browning (1992) for a discussion of such models and the effects of children.

It is clear from Figure 5 that labor force participation of three groups commonly used as "controls" have no discernable trends. Single women with no children and black men, the top two lines in the figure, have high and unchanging rates of labor force participation. Single women who dropped out of high school but have no children also have steady (or even declining) rates of labor force participation. The three groups of women eligible for the EITC all had rising rates of labor force participation, particularly after 1992. These are all single women with children, single women who dropped out of high school and have children, and single women with children under 6.

Eissa and Liebman (1996) examine the 1986 EITC expansion to estimate its effects on the labor force participation of single women and, conditional on working, their hours of work. To isolate those affected by the policy from those who are not, they "assign" single women with children to their experimental group and single women without children serve to their control group. They find that the 1986 tax reform (including the EITC changed) increased labor force participation among all single women with children by as much as 2.8 percentage points (from a base of 74.2 percent). The effects are much larger (on the order of 6 percentage point) for women with children and less than a high school education.

Eissa and Hoynes (1998) use the same strategy to estimate the effects of the 1993 EITC expansion on labor force participation. They also use a difference-in-difference estimator in which women with two or more children serve as the treatment group and households with only one child constitute their control group. In this latter case, they are estimating the average effect of the differential expansion of the EITC by numbers of children. In general, they find modest negative effects of the EITC on married women's labor force participation, estimating the EITC expansions between 1984 and 1996 reduced the likelihood of labor market participation by

around 1.2 percentage points (or 2 percent).

Finally, Ellwood (1999) exploits the difference-of-differences approach in which he classifies parents according to their position in the distribution of predicted wages, comparing women in the lowest (predicted) wage quartile with those in higher quartiles to distinguish groups who are likely to be affected by the EITC (the lowest quartile) with those who are not (the higher quartiles). He concludes

> "As we might expect, there is considerable variation in the relative contributions of various factors depending on what comparison group one uses – we are beginning to cut the data rather thinly. If we simply average … estimates, we get a rough conclusion that perhaps 20% of the growth in work can be traced to the economy, perhaps another 50% is linked to welfare reform and the remaining 30% can be traced to the EITC and other work supports. Each of these might be too high or low by perhaps 10%" (page 25).

As mentioned earlier, to the extent that changes in policies other than the EITC or other "environmental" factors are coincident with the EITC expansions, there is the potential for bias in their difference-in-difference estimator. Many states, for example, implemented changes in their welfare programs during the latter part of the 1980s, including reducing the growth in guarantees and the imposition and tightening of work rules for recipients. Given the AFDC eligibility criteria, these changes are likely to have differentially affected single women with children relative to those without children. Furthermore, there is potential for the composition of the treatment and control groups in these studies to have changed over time.[39] This is particularly problematic in the analyses done by Eissa and Liebman (1986) of the effects of the EITC on hours of work for working single women. To the extent that the composition of the populations

[39] Ellwood (1999) raises similar concerns (with different language), pointing out that with comparisons of single women with and without children, one cannot disentangle the separate effect of policy changes and everything else going on in the economy. One can only hope to test the overall impact of the combination of policies in a strong economy. He also notes that the temporal pattern of labor force participation of the two groups is often different before the enactment of the EITC, so drawing inferences from differential trends afterwards is troubling. Moreover a large fraction of childless single women are already workers even before EITC expansions, so their employment cannot grow much.

of working women change over the 1980s, the standard problem of selectivity bias arises can arise in the difference-in-difference estimator estimated with data from repeated cross-sections. We note that the authors, including Eissa and Liebman, acknowledge these sources of potential bias in their analysis. In many cases, they attempt to account for their influence by controlling for observable personal characteristics in regression-adjusted versions of their difference-in-differences estimates. At issue, is the adequacy of these control groups.

There is another important feature of the natural experiment (or difference-in-difference estimation) approach that limits its generalizability and applicability to assessing the impacts of alternative designs of the EITC. As Eissa and Liebman (1996) make clear, this expansion entailed a change in several parameters of the credit in that the phase-in rate, phase-out rate and maximum credit all changed simultaneously. As can be seen in Table 1, the other major expansions in the EITC also entailed changes in several of the EITC parameters. For some purposes, it would be desirable to separate out the specific effects of each of these parameters. In Section III, we noted that a simple labor-leisure model predicts that households in the phase-out region of the credit would reduce their labor supply in response to an increase in the phase-out rate, all else equal, while the effect of increases in the phase-in rate on hours of work depend on the relative strength of the substitution and income effects associated with this change. Determining the direction and magnitude of the behavioral responses to changes in each of these parameters is useful for assessing the validity of this model and for assessing the likely impacts of alternative designs of the EITC beyond those actually implemented.

Identification and Studies of the Effect of the EITC Based on Quasi-Structural Models

A class of estimation methods that have been used in the analysis of the labor force and labor supply effects of the EITC exploits the fact that the EITC alters the effective wage or

effective tax rates that certain types of individuals and/or households face. This approach is based on what one might call "quasi-structural" labor supply models, using variants of the estimation approaches developed in the literature that estimates the parameters of the neoclassical labor supply and labor force participation models.[40] In the EITC literature, the work of Hoffman and Seidman (1990); U.S. General Accounting Office (1993); Holtzblatt, McCubbin, Gillette (1994); Dickert, Houser and Scholz (1995); Eissa and Hoynes (1998); and Meyer and Rosenbaum (1999a, 1999b) are based on this approach.

An early example of this work is the study of Dickert, Houser and Scholz (1995), which measures labor force participation elasticities using data from the 1990 Survey of Income and Program Participation. They construct a detailed tax and transfer simulation model that reflected precise estimates of state and federal income taxes, payroll taxes, AFDC, food stamps and Supplemental Security Income. The simulation model allowed them to characterize the enormous variation in budget sets that families face in different states. They use an IV approach (described below), calculating the after-tax change in incomes that would result from taking a half-time (and in some specifications, full time) job at the predicted wage relative to being out of the labor market. The intuition underlying the study is that in high benefit states (like New York at the time), the after-tax return to work is fairly low since substantial benefits are clawed back, while in low-benefit states (like Texas at the time), the after-tax return to work is high since there are few benefits to lose. Thus, if labor market participation decisions are sensitive to the after-tax returns to work, participation rates should be higher in low-benefit states than high-benefit states, all else being equal.

Dickert, Houser and Scholz find consistently strong participation effects of the expected

[40] See Pencaval (1986), Heckman and Killingsworth (1986) and Blundell and MaCurdy (1999) for surveys of this work.

direction (they also jointly estimate a reduced form equation for the welfare participation decision), which suggest that EITC-induced changes in the returns to work increases labor market participation. They find a 10 percent increase in the after-tax wage results in a 2 percentage point (or 3.5 percent) increase in labor market participation among single parents. Their estimates also show that participation of secondary wage earners will fall as a consequence of the EITC. Their methodology does not allow them to calculate the hours worked by new participants. They also do not provide new empirical work on the effect of the EITC on hours of work for those already in the labor market, and instead do a range of simulations based on existing estimates. Their central results suggest that as long as new participants work at least 293 hours per year, the aggregate positive participation effects outweigh the negative hours effects and the 1993 EITC expansions resulted in a net increase in aggregate hours of work.

The potential problem with the Dickert, Houser and Scholz (1995) study is that there is no variation in the EITC that is used to identify the participation effects (the data are a cross-section, and the EITC is a uniform Federal program). Moreover, idiosyncratic state-level factors correlated with family budget sets and labor market decisions could bias estimates. Hoynes (1997), for example, shows that including state fixed effects can significantly alter estimates of the effects of AFDC on female headship.

Meyer and Rosenbaum (1999a) significantly advance the literature in their analysis of the effects of the EITC and other policy changes on the labor force participation of single women. They develop an econometric model of labor force participation, calculating the probability that the utility of working exceeds the utility associated with not working. That is, the probability of working is given by:

$$\Pr\left(U(Y_w, L_w, P_w, X, \varepsilon_w) > U(Y_{nw}, L_{nw}, P_{nw}, X, \varepsilon_{nw})\right) \tag{5}$$

where $U(Y_k,L_k,P_k,X)$ are the indirect utility functions associated with the work (w) and no-work (nw) states, Y_k is the income the woman receives in the k^{th} state, L_k is her leisure time in alternative states, P_k denotes her participation in welfare programs (to capture potential transaction costs and stigma associated with participation in such programs), X denotes observable characteristics and ε_k represent unobserved, stochastic components of tastes. The influence that the EITC and other programs have on wages and income enter through the specifications of the incomes associated with the work and non-work states.

Meyer and Rosenbaum (1999a) specify Y_w and Y_{nw} as functions of parameterizations of the EITC, federal and state tax rules and the characteristics of other welfare programs facing women at different times and in different states, utilizing an exhaustive set of data on the tax structure and welfare programs. Linearizing $U(\cdot)$ with respect to its arguments and using a non-parametric strategy to calculate *expected* values of income associated with the work state for women in their data, they use a probit specification to estimate their labor force participation model. In the econometric specification they use, the effects of differences in $E(L_w)$ and L_{nw} are absorbed by variation in the X's.

Their labor force participation estimates cover the period 1984-96 for single women. They find that EITC changes account for 63 percent of the increase in the employment rate of single mothers from 1984 to 1996 and 37 percent of the increase from 1992 to 1996. Given the changes in employment rates and the size of the EITC changes over this period, their results are broadly consistent with the earlier papers, though as we show in Table 4, their estimated elasticities of labor force participation with respect to net income are the smallest of the range of existing studies (though all estimates are quite close).

There are two points to note about the approach used by Meyer and Rosenbaum (1999a) to

model the effects of the EITC on the labor force participation of single women during the 1980s and 1990s. First, as already noted, their method more explicitly accounts for the actual EITC changes that occurred over the last two decades than other studies in the literature. This is in contrast to the difference-in-difference approach, which tries to identify the behavioral effects of the EITC off the timing of the EITC changes and differences in eligibility for the EITC for various groups in the population (e.g., single women without children). Second, their method nets out the influence of changes in other policies, both over time and across place-of-residence in order to isolate the influence of the EITC. As noted above, dealing with the influence of other policy changes is potentially important, especially to the extent that such changes had differential impacts on households with and without children. The existence of these latter effects is a potential source of bias in the difference-in-difference estimators used by others to identify the effects of various EITC expansions.

Identification and Studies of the Effect of the EITC Based on Structural Models

The non-linear or kinked nature the budget set induced by the EITC program, however, can result in non-marginal changes in behavior that complicate efforts to rely on wage and income elasticities drawn from other econometric studies. This can be seen in Figure 4 for the Type *III* individuals. The optimal pre-EITC labor supply choice for a Type III individual would generate labor earnings that exceed the upper threshold for EITC eligibility. Because of the non-convexity introduced with the EITC phase-out range, one could observe individuals reducing their labor supply and earnings so as to be eligible for a credit. Such non-convexities in the phase-out region requires one to know more than just the income and substitution effects in order to assess the response to EITC changes. In particular, it requires knowledge of the underlying preferences for work versus leisure to determine whether such behaviors are likely to occur.

One approach, which we characterize as the "structural" approach, explicitly parameterizes the preferences and constraints facing individuals and then exploits the theory of optimal decision-making to characterize the likelihood function that is used to reconcile observed labor supply and program participation behaviors. This approach is exemplified in the work of Hausman (1985) on the effects of income tax structure on the labor supply and Moffitt (1990) and Keane and Moffitt (1998) in the study of the labor supply impacts of welfare and other social programs.

Keane and Moffitt (1998) and Keane (1995) (based on the Keane and Moffitt model) use their model estimates to examine a wide range of policy reforms, including changes to AFDC and food stamp tax rates, a variety of wage and work subsidies and changes to the EITC. Their EITC simulations find that the expansions between 1984 and 1996 increased labor force participation by 10.7 percentage points, from a base of 65.4 percent. They also find the aggregate effect of the EITC expansions was to increase hours of work.

A recent study by Blundell, Duncan, McCrae and Meghir (1999) seeks to estimate the likely impact of alternative implementations of an EITC-like tax credit scheme in the United Kingdom (called the Family Working Tax Credit) before it is actually implemented. This type of application is one of the most valuable uses for structural estimates. In general, greater knowledge of the "structure" of individual and household preferences and their choice processes is required to predict the behavioral responses to complicated, hypothetical policy changes than is needed to assess the net impacts of straightforward, observed changes in the credit. At the same time, identification of these structural features of decision-making is inherently more difficult than estimating net effects of observed expansions.

Estimates of the EITC and Hours of Work

Studies estimating the effects of the EITC on hours of work for those households who are working, find small, negative effects. These studies are summarized in the second panel of Table 4. Liebman (1997a) also shows that there is no bunching of taxpayers at the beginning and end of the phase-out range, as might be expected with the discontinuity in the implied marginal tax rates. As Liebman notes, it is not surprising that negative effects on hours for people already in the labor market are small because the precise relationship between the EITC and hours worked is likely to be poorly understood by most taxpayers. The majority of EITC recipients pay a third party to prepare their tax returns and it is difficult to infer the implicit tax rates embodied in the credit from the look-up table that accompanies the EITC instructions. This confusion is less likely to mitigate positive participation effects, since for these to be operative, taxpayers only need to understand there is some tax-related bonus to work. There is abundant anecdotal evidence that taxpayers have this understanding (see, for example, DeParle, 1999).

The methodologies underlying the existing studies of hours have proceeded in one of two ways. The standard approach to estimating the effects of policies on hours of work is based on the now-standard labor supply equation that takes that following generic form:

$$h = \alpha_0 + \alpha_1 w^* + \alpha_2 Y^* + \beta X + u\,, \tag{6}$$

given $h > 0$, where h is the number of hours worked, w^* is the effective wage rate, Y^* is the individual's effective non-labor income, the Xs are again used to capture observable differences and u is an error term. The parameters, α_1 and α_2 in (6) represent the uncompensated wage effect and income effect, respectively, and $\alpha_1 - \alpha_2 h_0$ represents the compensated wage, or substitution, effect, evaluated at some level of hours of work, h_0. In the context of estimating the effects of taxes and other social program on hours of work, one crucial issue is how to deal with the

potential endogeneity of w^* and Y^* when estimating α_1 and α_2. The endogeneity of effective wages and incomes facing individuals arises because of the non-linearities in the budget sets in the presence of taxes and transfer programs that individuals face. Even if before-tax and transfer wages and before-tax sources of unearned income facing an individual are assumed to be exogenous (which are controversial assumptions in their own right), effective wages and income levels are presumed to be endogenous due to the fact that choice of the segment of the budget constraint that individuals choose may depend upon their tastes and preferences that are, in part, reflected in their value of u, giving rise to endogeneity bias in the estimation of α_1 and α_2. Such bias is likely to be more problematic when individuals face non-convex budget sets created, for example, by the phase-out region of the EITC.

Several econometric strategies have been employed in an attempt to mitigate these biases. They differ in the sources of variation they use to identify the effects of tax and transfer programs, the degree to which the estimates can be used to estimate more general sets of counterfactual regime changes, and the extent to which they rely on maintained assumptions about unobserved components of preferences and their distributions. The most common strategy used in the existing literature on the effect of the EITC on hours of work is to use "instrumental variables" (IV) methods. Eissa and Hoynes (1998) use the IV strategy to estimate variants of α_1 and α_2, which they then use to simulate the effects of changes in the EITC on hours of work. The IV approach also has the benefit of its relative simplicity and holds the promise of obtaining wage elasticities that can be used to analyze more general policy changes. At the same time, these methods are vulnerable to the concerns raised above about reliance on wage and income elasticities to make inferences about the effects of program changes characterized by non-linear, and especially non-convex, budget sets. Furthermore, the validity of these estimates is dependent

on the validity and power of the instrumental variables themselves, i.e., that the variation in the instrument reflects variation that is exogenous to the (endogenous) net wages and incomes of individuals.

Summary

The previous paragraphs have considered alternative econometric models used in analyzing the effects of the EITC on labor force participation and hours of work. We also have discussed the empirical studies that have produced estimates of such effects based on these methods. To avoid missing the substance for the methods, we conclude this section with a brief summary of what lessons we have learned from these studies about what the evidence, to date, has to say about the impact that expansions in the EITC have had on the labor supply of low-income populations.

We draw four broad conclusions from the empirical work on the EITC and labor force participation and hours. First, based on the evidence from many studies, the EITC positively affects the labor force participation of single-parent households. Second, in aggregate, the positive participation effects appear to be fairly substantial. Meyer and Rosenbaum (1999a), for example, suggest that as much as 63 percent of the increase in single mothers' labor force participation between 1984 and 1996 could be attributed to the EITC, while as much as 37 percent of the increase from 1992 to 1996 could be attributed to the credit. Labor force participation elasticities with respect to net-of-tax income reported in Table 4 range from 0.69 to 1.16. Third, as would be expected given the tax treatment of secondary workers in two-earner couples, the EITC has a modest, negative effect on labor force participation for secondary workers in two-parent families. Fourth, the EITC has a negative effect on hours worked by those in the labor force, but studies (Dickert, Houser and Scholz, 1995; Keane and Moffitt, 1998; and

Meyer and Rosenbaum, 1999a) suggest that the aggregate hours effect of the EITC, once participation effects are accounted for, is positive.

Labor market issues have received more attention than other EITC-related issues, but more could usefully be done. Probably the most powerful way to look at EITC labor market effects is to look at differences in labor market patterns for families with one and two-or-more children starting in the mid 1990s (when the discrepancies began to get large, see Table 1). To do this effectively, large samples are needed. In addition, it would be very nice to have longitudinal data where analysts can follow the same households over time. There may be potential for conducting such studies with some of the linked administrative datasets that are being used to evaluate welfare reform. It is also possible that the *responsiveness* to various policies, such as the EITC, and labor market conditions *may have changed* over time. This possibility is suggested by Moffitt (1999) in his recent analysis of the determinants of caseload reductions. He finds that the welfare participation of low-income populations appear to be more sensitive to changes in labor market conditions during the 1990s than was the case in earlier decades. Additional attention could be paid to augmenting the labor market proxies employed in the studies. There is some evidence that state unemployment rates, the variable typically used, are too blunt, which makes it hard to disentangle business cycle effects from policy changes.

Marriage and family formation

As noted earlier, the EITC can lead to large marriage penalties and bonuses depending on the relative incomes between potential partners. Once these incentives have been clearly documented, as is done by Dickert-Conlin and Houser (1998) and Holtzblatt and Rebelein (1999), it is natural to ask whether they appear to affect behavior.

Three recent papers examine whether the EITC encourages the existence of female-headed

families. Dickert-Conlin and Houser (1999) parameterize the financial incentives in AFDC and the EITC and look at correlations between changes in these variables and female headship. They find little impact of AFDC and some increase in female headship from the EITC for whites in some models and a decrease in female headship as a result of the EITC for blacks. In general the results are typically small and frequently inconsistent across specifications. Eissa and Hoynes (1999) also find modest or nonexistent effects on family formation.

Ellwood (1999) takes a quite different strategy. Rather than isolating the specific effect of marriage on tax and transfer payments, he looks at data from the Panel Study of Income Dynamics and focuses on 1,671 marriages that women in the sample entered between 1983 and 1991. He measures penalties and bonuses by the income in the last year prior to marriage and the first year after marriage to look at whether families would be net winners or losers had the 1996 EITC provisions been in place when they married. Clearly other factors (like post-marital child-bearing or other changes in income) can affect these comparisons. Ellwood then looks at patterns of marriage incentives over time across wage and skill groups, and the corresponding marriage patterns. He concludes,

> "Though the EITC sharply reduced marriage penalties and welfare reform has pushed many people off welfare, there is no discernable increase in marriage or decrease in cohabitation among the lowest skill single mothers. Indeed, their marriage rates continue to fall sharply. Conversely, even though the EITC increase marriage penalties for middle and higher wage mothers, there was no noticeable reduction in marriage for these groups. The overall results show no indication at all that changes in the EITC affected marriage patterns" (page 38).

The evidence on the EITC's effects on marriage and fertility mirrors the broader evidence from the literature on transfer programs. Moffitt (1998) surveys studies of the effects of welfare on marriage and fertility and concludes "a neutral weighing of the evidence still leads to the conclusion that welfare has incentive effects on marriage and fertility," but the effects tend to be

small and they are not able to explain time-series increases in nonmarital fertility and declines in marriage rates. Moffitt also notes that results tend to vary significantly based on the methodology used and other specification differences.

Human Capital Formation[41]

Until now, we have ignored the potential impacts of the EITC on an important issue related to the ability of the EITC to alleviate poverty, namely its effect on human capital or skill development among workers. The argument is sometimes made that pro-work programs provide a double bonus, because they not only induce people to work but that, by going to work, low-skilled individuals can acquire productive skills that can enhance their future earnings. Drawing from the literature on human capital investment, the issue is what effect does the EITC have on skill formation and wage growth among low-skilled populations?

Formal models of human capital investment emphasize that the decision of workers to invest in skill formation depends on the comparison of the opportunity cost associated with time spent acquiring skills with the future returns to wages that result from the acquired human capital. As noted in a recent paper by Cossa, Heckman and Lochner (1999), programs that affect the value of market work, such as the EITC, may affect these costs and returns. The effect of the EITC is further complicated by the differential effects it has on effective wage rates. As noted above, the EITC raises the effective wage rate in the phase-in region, leaves it unchanged in the flat region and lowers the effective wage rate in the phase-out region. Thus, whether the opportunity costs of human capital investments and the returns from such investments are raised or lowered by the EITC depends critically on which part of the EITC applies and over what time intervals.

[41]This section draws heavily on Cossa, Heckman and Lochner (1999).

Moreover, exactly how programs like the EITC affect skill acquisition and life cycle wage growth depends on what model characterizes the human capital accumulation, or production, process. In particular, if one assumes that work-related skills are largely acquired as a by-product of work, i.e., via "learning-by-doing" (LBD), then programs that encourage greater labor force participation and hours of work will tend to encourage skill acquisition.[42] In contrast, if learning, either via formal schooling or while on the job, is rivalrous with working, as is the case with a Ben-Porath (1967) "on-the-job" (OJT) training, schemes that encourage work may discourage skill acquisition.[43]

Using data from the 1989 CPS, Cossa, Heckman and Lochner (1999) estimate the structural parameters for hours of work and wage equations profiles for OJT and a LBD model of life cycle human capital investment and time allocation. Based on these models, the authors simulate the effects of the presence of an EITC on life cycle labor supply decisions, human capital investments, and wage growth. Their simulations imply very different patterns of EITC effects on these decisions across the OJT and LBD models of human capital formation, even though the models do not appreciably differ in their fit of the data. For example, their simulations show that while the two models yield similar predictions of the effects of the EITC on human capital formation via its effect on labor market entry by females, they yield different effects on the intensive labor supply margins. In particular, the overall effects of the EITC on skill formation are negligible in the OJT model, once one takes into account the effects on labor force entry and hours of work. In essence, the positive effects on the extensive margin just offset the negative effects of the EITC on the intensive margin. In contrast, the LBD model suggests that the EITC's

[42] See, for example, Weiss (1972) for an exposition of the formal model of learning-by-doing applied to the human capital investment context.

[43] This is true in the human capital models of Becker (1964) and Ben-Porath (1967).

positive effects on labor force entry are not enough to offset the negative effects on hours of work for those who are working.

These provocative findings in Cossa, Heckman and Lochner (1999) suggest the need to devote attention to the life cycle implications that the expansions of the EITC, to understand the potential for the credit to improve the skills, and thus the well-being, of disadvantaged populations in the U.S.

Consumption

A central issue when thinking about the EITC and consumption is the degree to which the credit allows people to smooth the marginal utility of consumption. One would think the advance payment option might help people do this. However, in 1998 only 185,027 out of 16,118,328, or 1.1 percent, of EITC claimants with qualifying children took advantage of this option.

Barrow and McGranahan (2000) examine whether consumption appears to increase for EITC-eligible families in months, particularly February, when they are likely to receive the EITC. The topic is an interesting one, since the models economists typically use to think about consumption would predict that families would not immediately spend their EITC upon receipt, but rather would spread EITC-financed consumption over the year (or lifetime). Hence, standard models would predict there is no discernable effect. Yet there is some evidence that significant portions of the population are liquidity constrained, and hence have consumption patterns that track income receipt very closely.

The authors use monthly data from the Consumer Expenditure Survey on non-durables and durables from 1982 through 1996. Using regression models of monthly consumption with month dummies, month dummies interacted with (simulated) EITC eligibility, and family economic and demographic characteristics, they find that EITC-eligible households spend approximately 5

percent more on durable goods in February, the modal month of EITC refund, than do households not eligible for the credit. On average for the other months, EITC-eligible households spend 4 percent less (conditioning on other characteristics). They show these results are not driven by income differences or differences in family size between EITC-eligible and ineligible families. They also show that the seasonal effects are larger after the 1990 EITC expansions, as would be expected. The estimated magnitudes suggest EITC recipients spend less (and possibly considerably less) than the full amount of their refund in the month of receipt, but they convincingly document that the income seasonality caused by receipt of the EITC leads to changes in seasonal expenditure patterns, particularly for durable goods.

Smeeding, Ross-Phillips, and O'Connor (1999) fielded a survey of low-income taxpayers who used tax preparation services at a neighborhood legal clinic in Chicago and solicited detailed information about the anticipated and actual uses of the EITC. The study provides useful information on how the EITC is used by families. A next step in this research program would be to examine what families would do at the margin with, say, an additional $100 a month through regular earnings (or welfare) and compare that to the uses to which the lump-sum EITC is put. The authors suggest that the lumpiness of the EITC might allow people to make investments that enhance social mobility. Further work that examines this conjecture would be valuable.

VI. Assessing Proposed and Potential Modifications to the EITC

Given the central role played by the EITC in the nation's antipoverty programs, it is not surprising that a broad range of possible credit modifications have been raised. Like the historical forces shaping the credit, these proposals tend to push the credit toward improving behavioral incentives or toward enhancing its antipoverty effectiveness. In this section we discuss some of these issues.

Marriage Penalties

The Fiscal Year 2001 Budget contains a proposal to reduce EITC-related marriage penalties. Specifically, it proposes to extend the flat range of the credit by $1,450 and reduce the phase-out rate to 19.06 from 21.06 percent for taxpayers with two or more children.[44] The proposal is motivated by the general concern that the U.S. tax structure adversely "penalizes" some married couples. In particular, as mentioned earlier, Holtzblatt and Rebelein (1999) show that under their preferred specification, the EITC increases net marriage penalties in the individual income tax by $3.6 billion.

Several things should be kept in mind when thinking about EITC-related marriage penalties. First, as noted earlier, the tax system cannot simultaneously be progressive (have increasing average effective tax rates), treat the family (as opposed to individuals) as the unit of taxation, and be neutral with respect to marriage. Hence, either penalties for singles or marriage penalties are inevitable, unless the structure of individual income taxation is dramatically altered. Second, as noted by Holtzblatt and Rebelein, 62 percent of EITC-related marriage penalties are borne by couples with incomes above the amount necessary to be eligible for the EITC. We suspect that policy-makers are considerably less concerned about the marriage penalty that arises for a worker with earnings of $40,000 and his spouse with earnings of $10,000 (if they split and the spouse took the children, she could get a large EITC) than they are about the family formation incentives that apply to unemployed or sporadically employed workers with or without children. Third, an extensive literature has examined the effects of antipoverty programs on marriage and fertility generally has found relatively small effects.

[44]The FY2001 Budget proposal is fairly well targeted to reducing EITC-related marriage penalties, though it also increases bonuses to two-earner married couples where earnings of the two spouses are quite different.

Administering the EITC Through the Tax System and Other Issues of Credit Design

During debates over restructuring the IRS,[45] the Co-chair of the National Commission on Restructuring the IRS, Rob Portman (R-Ohio), frequently pointed to the EITC as being a "non-tax function of the IRS." The rationale for this sentiment is that tax rules are sufficiently complex that it is already beyond the IRS's ability to effectively administer the laws required to accurately collect taxes. Congressman Portman views the EITC as a social welfare spending program that the IRS has been asked to administer. In so doing, resources are diverted that could help the IRS better collect taxes.

There is, of course, a clear relationship between all tax expenditures and spending programs so any deviation from a comprehensive income tax could be viewed as a situation where the IRS is being asked to carry out some function other than tax collection to achieve some social purpose.[46] The practical question to pose in optimally configuring the tax system and spending programs is what is the marginal cost of providing specific incentives through the tax system relative to the best alternative delivery mechanism. In the case of the EITC, there are strong arguments in support of running the EITC through the tax code. Because filing thresholds are fairly low and, because of over-withholding, most low-income families with earnings already file tax returns. Consequently, they are already in the system, so the incremental cost of claiming the EITC to the taxpayer is low. The IRS collects income information from both employers and employees, so it is straightforward in most circumstances to verify income eligibility. The IRS has little ability to document living arrangements, however, so a significant number of errors arise in determining who is able to claim an EITC qualifying child. New developments with the Federal Case Registry of Child Support Orders may improve the IRS' ability to handle this

[45]See, for example, "The New IRS Law," *Washington Post*, July 23, 1998, Albert Crenshaw, A6.

[46]See Surrey (1973) for an early discussion of the concept of tax expenditures.

aspect of EITC eligibility.

Just because a case can be made that an EITC-like subsidy may appropriately be delivered through the tax code does not mean that the EITC is optimally designed. Liebman (1999b) examines the optimal phaseout rate of the EITC. A more rapid phaseout will reduce the utility of some EITC recipients and may cause some taxpayers to leave the labor market. At the same time, it will reduce the cost of the program, which, if the marginal excess burden of tax collections is high enough, may lead to an increase in overall welfare given specific social welfare weights on different income groups. Liebman uses simulation analyses to highlight the magnitudes of the various behavioral issues in question. Results are naturally sensitive to the compensated labor supply, the marginal excess burden of taxes, and the characteristics of the assumed social welfare function. His simulations tend to result in optimal phaseout rates that bracket the current rates for families with one and two or more children.

Adjusting further for family size and tighter integration with the tax system

The FY2001 Budget contains a proposal to add a third tier to the federal EITC schedule for families with three or more children, which would result is an EITC schedule similar to the structure of the Wisconsin state EITC. Specifically, the phase-in rate would be increased to 45 percent from 40 percent, adding nearly $500 to the maximum EITC available to a taxpayer with three or more children. The flat range of the credit and its phase-out rate would stay the same (though note the proposed change to the phase-out rate for married couples with two earners). The rationale for the proposal is that in 1998 the child poverty rate for families with three or more children was 28.5 percent, twice the 11.9 percent rate for children in smaller families. The potential drawbacks of the proposal is that it costs money and it further increases incentives for people to have children and, in some circumstances, to be a single parent.

The Minnesota state EITC also may have useful lessons for the federal credit. Recall that Minnesota adjusts their phase-in and phase-outs of the state credit to smooth notches that are generated by features of the federal and state tax and transfer programs. As is clear when plotting the budget sets facing families with one- and two-children, there are unusual notches and kinks in the budget set, particularly when the effects of transfer programs are taken into account. It would be straightforward to alter the phase-out rates to smooth marginal tax rates at the income levels around which families begin to pay positive levels of federal income taxes (in the absence of the EITC). While this would increase headaches for people trying to describe the structure of the credit, it would have little practical consequence for people taking the credit since the credit amount is invariably found from lookup tables in the EITC instructions or by requesting the IRS to calculate the credit. At the same time, while smoothing out the phase-out rates would have clear esthetic value, it might have very little practical consequence since it is unlikely that any but the most sophisticated workers would recognize the link to incremental labor market decisions and the size of their lump-sum EITC after filing tax returns.

Cherry and Sawicky (2000) and Ellwood and Liebman (2000) go well beyond the Minnesota model and develop more systemic policy proposals that would, under some options, integrate the EITC, dependent exemption, and child credit. The Cherry-Sawicky "unified universal child credit," for example, would rise for an initial range of earnings, flatten out over an additional range and then phase down to a minimum benefit of $1,270 per child, the value of the dependent exemption and child credit for a taxpayer in the 28 percent bracket. The proposal would cost more than $30 billion per year, but the modification would reduce some of the labor market disincentives and marriage penalties that arise in the current EITC, significantly increase benefits available to low- and moderate-income families with many children, and provide

considerable additional tax benefits to families with children and incomes between roughly $25,000 and $50,000.[47] While a complete analysis of this idea is well beyond the scope of this chapter, both papers provide reminders that with deficits no longer the dominant characteristic of the fiscal landscape, it is useful to consider potentially far-reaching ways to improve the tax system.

EITC and TANF Interactions

As state TANF programs evolve, clear rules need to be made about what kinds of state subsidized activities will trigger EITC eligibility and what activities will not. The polar cases are easy to identify: TANF payments that are like payments made under AFDC would not qualify as income for the purposes of the EITC. The wages earned while a single mother works and receives a TANF grant for child-care will be considered income for the EITC. Congress explicitly has indicated that "work-experience" and "community-service" jobs will not trigger the EITC. But there is a vast gray area of other TANF-supported activities that need to be clarified. The tradeoffs in clarifying the rules are clear: making as many people engaged in work-like activities eligible for the EITC as possible will be more costly than having more restrictive rules, but will also make an additional source of support available to poor families, and the EITC may help reinforce the work-expectation message that is at the core of many state TANF programs. Attention might also be paid to the link between the EITC and TANF-based asset tests.

The advance payment option

Only 1.1 percent of EITC recipients with children used the advance payment option in 1998.

[47] Somewhat thorny technical issues would need to be worked out, such as who would get the unified universal child credit in situations where a noncustodial parent is currently paying child support and receiving the dependent exemption and the custodial parent is receiving the EITC. Integrating the dependent exemption and EITC could result in pressure to rewrite many divorce agreements.

Low use of the advance payment option has generated considerable discussion in policy circles, though we think this attention is somewhat misplaced. Simple calculations suggest that eschewing the advanced payment option, as currently designed, costs the taxpayer at most $52.77 (assuming the taxpayer could receive the maximum available advance payment each month, earns 8 percent interest and does not receive his or her refund until May). Given that low-wage workers may change jobs frequently, the transactions costs associated with setting up advanced payments can be fairly high. This, coupled with the possibility that someone will receive too much in advance payments and have to pay it back at tax time,[48] suggests that the utility cost of failing to take advantage of the advance payment option is likely to be small.

It is sometimes suggested that greater use of the advance payment option would reinforce the pro-work message of the EITC. Partly for this reason officials in the United Kingdom designed their EITC-like program, the Working Families Tax Credit (WFTC), to be received incrementally throughout the year. There are significant differences between the U.S. and U.K. experiences, however.[49] The WFTC is paid through the employer, retrospectively based on earnings, hours worked, and family income during the six-week period prior to the beginning of the payment period (the previous six months). So, someone could have a job, become eligible for the WFTC, and then leave the job and still receive the WFTC for the duration of the six months. Rules are in place to curb efforts to manipulate income to maximize the WFTC, but there is not yet any evidence of their effectiveness. Other aspects of the British tax system suggest less emphasis is placed on compliance (and perhaps greater emphasis is placed on minimizing the

[48] Holtzblatt and Liebman (1998) note that taxpayers are less likely to receive too much in EITC advance payments if income is only from wages. Only about one in four EITC claimants have income from only one source during the year, however. Advance payments also lengthen the time between when money is paid out and the IRS is able to verify eligibility.

[49] See Holtzblatt and Liebman (1998) for a more detailed discussion.

intrusiveness of tax authorities and associated forms) than occurs in the U.S., which may result in a greater willingness to tolerate likely over- or under-payments that might arise with the WFTC. The WFTC also replaced the Family Credit, which was delivered incrementally through the year.

VII. Summary and Conclusions

Over the last 25 years the EITC has become, by a considerable margin, the country's largest cash or near-cash program directed at low-income families. Its popularity is fairly easy to account for. Unlike safety net programs like AFDC, TANF and food stamps, the EITC gives no benefits to those without labor earnings. Thus, it subsidizes the incomes of people who in some sense are "doing the right thing." The appeal of this reaches across party lines. In addition, unlike the safety net programs, the EITC has unambiguously positive labor market participation incentives. By virtue of the fact that it provides no benefits for the most destitute, the EITC is not a *substitute* for the safety net. But its desirable labor market effects (relative to other safety net programs) and targeting of the working poor undoubtedly account, at least in part, for its rapid growth.

Research on the EITC has also been a growth industry in the last decade. In our review we have been struck by the variety of different topics and approaches that have been taken by researchers. We can think of no major EITC-related topic that has not had at least some attention serious scholars, possibly with the exception of the economic incidence of the credit. But that is not to say that we know everything necessary about the credit. We are lacking even the most basic information about the participation rate of the credit since 1990. Research on the labor market effects of the credit have pushed quasi-experimental and IV repeated cross-sectional analyses using the CPS to their logical limits, but there have not been a utility-based structural analyses of the EITC. There have been no longitudinal analyses of the EITC, which hold

considerable promise for controlling for unobservables in ways that are impossible with the CPS. Research on the EITC and family structure and fertility is in its infancy. Work initiated by Cossa, Heckman and Lochner (1999) also has considerable potential in enhancing understanding of the effects of the EITC and other policies directed at low-wage labor markets.

Stepping back further from current thrusts of the literature, there are two potentially promising new ways for research to develop. First, Smeeding, Ross-Phillips and O'Connor (1999) raise an important issue. To what extent and through what channels can the EITC enhance economic well-being? Are there nonlinearities associated with the EITC, possibly through its lumpiness, that allows the credit to enhance well-being in a way that differs significantly from equivalent-sized (in total) payments received throughout the year.

Second, it is easy for researchers to focus on narrow, well-defined questions that lend themselves to standard (or possibly innovative) methodological tools. Possibly as a consequence, however, there has been less attention to the design of the constellation of public policies that are or could be directed at low-wage labor markets. Questions along these lines would include, what are the relative merits of the EITC and employer-based wage subsidies, of the EITC and minimum wage, do the answers differ given existing tax and transfer provisions? Can the broader tax and transfer system be altered or more tightly integrated in welfare-enhancing ways? The specific research questions that have dominated the EITC agenda are critical ingredients for satisfactory answers to these more global issues, but it will be inappropriate as research evolves to only study the narrower issues at the expense of the broader.

Table 1: Earned Income Tax Credit Parameters, 1979-1998 (in nominal dollars)

Year	Phase-in Rate (%)	Phase-in Range	Maximum Credit	Phase-out Rate (%)	Phase-out Range
1975-78	10.0	$0-$4,000	$400	10.0	$4,000 - $8,000
1979-84	10.0	0-5,000	500	12.5	6,000 - 10,000
1985-86	11.0	0-5,000	550	12.22	6,500 - 11,000
1987	14.0	0-6,080	851	10.0	6,920 - 15,432
1988	14.0	0-6,240	874	10.0	9,840 - 18,576
1989	14.0	0-6,500	910	10.0	10,240 - 19,340
1990	14.0	0-6,810	953	10.0	10,730 - 20,264
1991[a]	16.7[1]	0-7,140	1,192	11.93	11,250 - 21,250
	17.3[2]		1,235	12.36	11,250 - 21,250
1992[a]	17.6[1]	0-7,520	1,324	12.57	11,840 - 22,370
	18.4[2]		1,384	13.14	11,840 - 22,370
1993[a]	18.5[1]	0-7,750	1,434	13.21	12,200 - 23,050
	19.5[2]		1,511	13.93	12,200 - 23,050
1994	23.6[1]	0-7,750	2,038	15.98	11,000 - 23,755
	30.0[2]	0-8,245	2,528	17.68	11,000 - 25,296
	7.65[3]	0-4,000	306	7.65	5,000 - 9,000
1995	34.0[1]	0-6,160	2,094	15.98	11,290 - 24,396
	36.0[2]	0-8,640	3,110	20.22	11,290 - 26,673
	7.65[3]	0-4,100	314	7.65	5,130 - 9,230
1996	34.0[1]	0-6,330	2,152	15.98	11,610 - 25,078
	40.0[2]	0-8,890	3,556	21.06	11,610 - 28,495
	7.65[3]	0-4,220	323	7.65	5,280 - 9,500
1997	34.0[1]	0-6,500	2,210	15.98	11,930 - 25,750
	40.0[2]	0-9,140	3,656	21.06	11,930 - 29,290
	7.65[3]	0-4,340	332	7.65	5,430 - 9,770
1998	34.0[1]	0-6,680	2,271	15.98	12,260 - 26,473
	40.0[2]	0-9,390	3,756	21.06	12,260 - 30,095
	7.65[3]	0-4,460	341	7.65	5,570 - 10,030
1999	34.0[1]	0-6,800	2,312	15.98	12,460 - 26,928
	40.0[2]	0-9,540	3,816	21.06	12,460 - 30,580
	7.65[3]	0-4,530	347	7.65	5,670 - 10,200

Source: 1998 Green Book, Committee on Ways and Means, U.S. House of Representatives, U.S. Government Printing Office, page 867. 1998 and 1999 parameters come from Publication 596, Internal Revenue Service

[a] Basic credit only. Does not include supplemental young child or health insurance credits.

[1] Taxpayers with one qualifying child.

[2] Taxpayers with more than one qualifying child.

[3] Childless taxpayers.

Table 2: State Earned Income Tax Credits, Tax Year 2000

	State	Percentage of Federal Credit
Refundable Credits	Colorado	10
	District of Columbia	10
	Kansas	10
	Maryland[a]	10
	Massachusetts	10 (15% in 2001)
	Minnesota	Averages 34%, varies by earnings[b]
	New Jersey	10 (20% by 2003), limited to families with incomes below $20,000
	New York	20 (30% by 2003)
	Vermont	32
	Wisconsin	4% one child 14% 2 children 43% 3 children
Nonrefundable Credits	Illinois	5
	Iowa	6.5
	Maine[a]	5
	Oregon	5
	Rhode Island	26

Source: Nicholas Johnson, 1999, "A Hand Up: How State Earned Income Tax Credits Help Working Families Escape Poverty in 2000: An Overview," Center on Budget and Policy Priorities, June 9, Particularly Table 1.

[a]A Maryland taxpayer may claim a refundable credit or a non-refundable credit (equal to 50 percent of the federal credit), but not both.

[b]Minnesota's credit for families with children, unlike the other credits shown in the table, is not expressly structured as a percentage of the federal credit. Depending on income levels, the credit may range from 22 percent to 46 percent of the federal credit.

Table 3: Maximum Real EITC Credit, Real Spending and Number of Participants
(in 1999 dollars)

Year	Real Maximum EITC	Real EITC Spending (millions)	Number of Claimants (thousands)
1975	1,239	3,871	6,215
1976	1,171	3,792	6,473
1977	1,100	3,098	5,627
1978	1,022	2,678	5,192
1979	1,147	4,709	7,135
1980	1,011	4,015	6,954
1981	916	3,504	6,717
1982	863	3,064	6,395
1983	836	3,002	7,368
1984	802	2,626	6,376
1985	852	3,233	7,432
1986	836	3,054	7,156
1987	1248	4,973	8,738
1988	1231	8,303	11,148
1989	1223	8,861	11,696
1990	1215	9,614	12,542
1991	1511	13,584	13,665
1992	1643	15,470	14,097
1993	1742	17,913	15,117
1994	2842	23,725	19,017
1995	3400	28,374	19,334
1996	3776	30,607	19,464
1997	3795	31,800	19,490
1998	3839	31,959	19,516
1999	3816	31,900	19,542

Source: 1998 Green Book, and general IRS Statistics of Income data on individuals available at http://www.irs.ustreas.gov/prod/tax_stats/soi/ind_gss.html. The data reflect claims (allowed through math error processing) and do not reflect subsequent IRS enforcement actions after math error processing

Table 4: Summary of Empirical Evidence on the Effects of the EITC on Labor Force Participation and Hours of Work

Study	Data Source and Population Covered	Years Covered	Estimation Method Used and Source of Identification	Impact Estimates
Labor Force Participation:				
Dickert, Houser and Scholz (1995), "DHS"	SIPP data. Cross-sectional, using state-level variation. Focus on participation effects of single parents and couples. Drop cases with high assets.	1990 calendar year file.	Variation in budget sets is measured by the effects that cross-state variation in tax and transfer rules have on the returns to moving from 0 to 20 (40) hours in the labor market. The responsiveness of LFP to the cross-state variation in budget sets is used to make inferences about EITC expansions.	The OBRA93 expansions would increase labor force participation by 3.3 percentage points for single women from a base of 56.4 percent. This implies the elasticity of labor force participation (LFP) with respect to net income is roughly 0.85, see note 1.
Eissa and Liebman (1996)	Repeated cross sections of the CPS. Focus on single women with children.	1985-87 March CPS for the "pre" period, 1989-1991 March CPS for the "post" period	Difference-in-difference. "The difference between the change in labor force participation of single women with children and single women without children is our estimate of the effect of TRA86 on participation."	TRA86 resulted in a 2.8 percentage point increase in labor force participation from a base of 74.2 percent. This implies the elasticity of LFP with respect to net income is roughly 1.16, see note 2.
Keane and Moffitt (1998) and Keane (1995)	SIPP data. Cross-sectional. The sample is single women with children. Drop cases with high assets.	Fourth wave of the 1994 SIPP.	Estimate a structural model taking detailed account of the tax and transfer system on budget sets. Families make hours decisions moving from 0 to 20 to 40, and participation decisions for food stamps, AFDC and housing programs.	Changes in the EITC between 1984 and 1996 would increase labor force participation rates by 10.7 percentage points, from a base of 65.4 percent. This implies the elasticity of LFP with respect to net income is roughly 0.96, see note 3.
Meyer and Rosenbaum (1999)	Repeated cross sections of the CPS. Focus on single women with children.	1985-1997 March CPS and Merged Outgoing Rotation Group data from 1984-1996.	Cross-state variation in budget sets as measured by the effects that cross-state variation in tax and transfer rules have on after-tax wages, where wages are randomly drawn from empirical distributions and over-time variation in these rules.	$1000 reduction in income taxes if a woman works, increases employment by 2.3 to 2.9 percentage points. These imply elasticities of LFP with respect to net income of 0.69 and 0.70. See footnote 35 of their paper.
Eissa and Hoynes (1998)	Repeated cross sections of the CPS. Focus on married couples, with fewer than 12 years of schooling.	1985-1997 March CPS.	Two approaches: difference-in-difference, and intertemporal variation in tax rates caused by tax reforms. The latter is captured by using predicted net of tax wages for everyone in the sample assuming a full-time, full-year job.	The EITC expansions between 1984 and 1996 increased LFP of married men by 0.2 percentage points and reduced the LFP of married women by 1.2 percentage points. The elasticity of LFP w/ respect to net wages is 0.03 for husbands and 0.29 for wives (page 22).

Table 4: (Continued)

Study	Data Source and Population Covered	Years Covered	Estimation Method Used and Source of Identification	Impact Estimates
Hours of Work:				
Hoffman and Seidman (1990), U.S. General Accounting Office (1993) and Dickert, Houser and Scholz (1995) – "DHS"	PSID for Hoffman and Seidman, CPS (?) for GAO and SIPP for DHS	1990 Calendar year file for DHS	Each study *simulates* hours responses using parameters from the negative income tax experiments, and, in the DHS study, parameters from the kinked budget set literature.	DHS simulate labor supply responses to the 1993 EITC expansion (1993-96) of –0.09 to –4.04 percent. These range from 0 to –3.17 percent for husbands, -1.47 to -11.36 percent for wives and -0.53 to -4.02 percent for single women heads. See Note 4.
Eissa and Liebman (1996)	Repeated cross sections of the CPS. Focus on single women with children.	1985-87 March CPS for the "pre" period, 1989-1991 March CPS for the "post" period	Difference-in-difference. Regression of annual hours on characteristics and dummy variables for kids, post-86 and their interaction.	Statistically insignificant effect on hours (the 1986 expansions were associated with an increase of 25.2 hours, with a standard error of 15.2).
Keane and Moffitt (1998) and Keane (1995)	SIPP data. Cross-sectional. The sample is single women with children. Drop cases with high assets.	Fourth wave of the 1994 SIPP.	Estimate a structural model taking detailed account of the tax and transfer system on budget sets. Families make hours decisions moving from 0 to 20 to 40, and participation decisions for food stamps, AFDC and housing programs.	The estimates show a modest increase in aggregate hours worked from the EITC expansions between 1984 and 1996. Mean weekly hours increase to 26.5 from 24.1. These changes are not broken into the contribution of new labor market participants and potential reductions of hours of those already in the labor market.
Eissa and Hoynes (1998)	Repeated cross sections of the CPS. Focus on married couples, with fewer than 12 years of schooling.	1985-1997 March CPS.	Instrumental variables with two sets of instruments. One has EITC parameters and interactions with birth cohort and education. The second uses imputed marginal tax rates for incomes in $5k increments from $0 to $100k.	The EITC expansions between 1984 and 1996 reduced hours of married men by 45 (or 2 percent) and reduced hours of married women between 13 and 93 (or 0.8 to 6 percent). Uncompensated wage elasticities are 0.06 to 0.07 for men and 0.08 to 0.52 for women. Income elasticities for men were –0.03 and for women, -0.04 to –0.41.

Note 1: The paper reports that the EITC increases the probability of working by 3.3 percentage points. Table 3 of the paper shows the mean labor force participation rate of single parents was 56.4 percent. Meyer and Rosenbaum (1999), Appendix Table 1 shows that taxes fell by $732 for single women with children in their sample between 1992 and 1996. Mean wages in DHS (1995) are $6.55. Data from Table 1 of Eissa and Liebman (1996) imply that single women with children worked 1,620 hours (conditional on working). This implies the elasticity of labor force participation with respect to the net-of-tax wage is (3.3/56.4) / (732/[6.55*1620]) = 0.85, as shown in the table. The sample used in DHS differs somewhat from the samples used in Eissa and Liebman, and Meyer and Rosenbaum primarily in that they drop families that would not be eligible for transfer program benefits even if they did not work (because they fail asset tests).

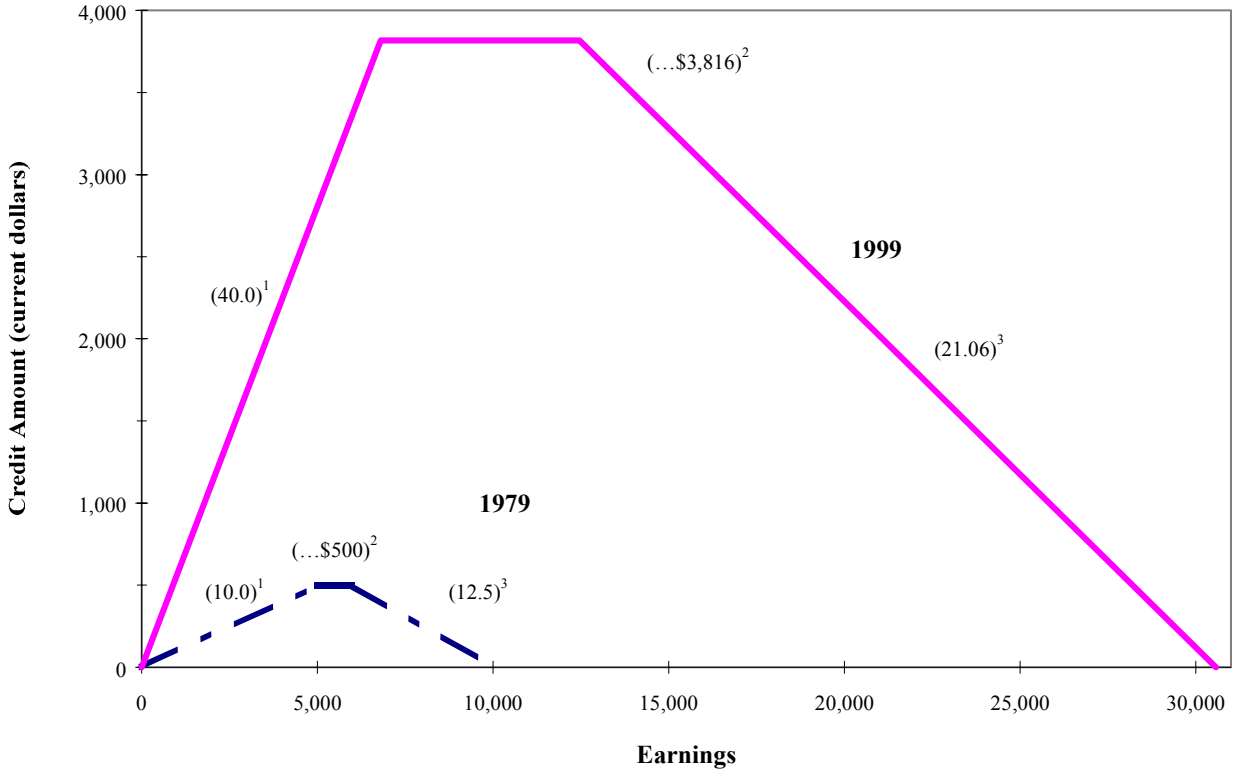
Note 2: The 1986 Tax Reform (TRA86) altered many aspects of the tax system in addition to expanding the EITC. From 1984-

86, the pre-period, the maximum EITC was between $500 and $550. From 1988 to 1990, the maximum EITC ranged between $874 and $953. TRA86 also increased the standard deduction for head of households to $4,400 in 1988 from $2,480 in 1986; increased the dependent exemption to $1,950 in 1988 from $1,086 in 1986, and extended the 15 percent bracket for head of household filers. Meyer and Rosenbaum (1999), Appendix Table 1 shows that taxes fell by $492 for single women with children in their sample between 1984 and 1988. Eissa and Liebman report that earnings, conditional on working in their sample were $15,188. This implies the elasticity of labor force participation with respect to the net-of-tax wage is (2.8/74.2) / (492/15188) = 1.16, as shown in the table.

Note 3: Table 5 of Keane (1995), which is based on Keane and Moffitt (1998) shows that increasing the EITC to 40 percent increased labor force participation rates by 10.7 percentage points from a base of 65.4 percent. In the text, this experiment is characterized as increasing the EITC to its 1996 level from its 1984 level. Meyer and Rosenbaum (1999), Appendix Table 1 shows that taxes fell by $1,443 for single women with children in their sample between 1984 and 1996. Mean wages in Keane and Moffitt (1998) are $5.20. Data from Table 1 of Eissa and Liebman (1996) imply that single women with children worked 1,620 hours (conditional on working). This implies the elasticity of labor force participation with respect to the net-of-tax wage is (10.7/65.4) / (1443/[5.20*1620]) = 0.96, as shown in the table. Like DHS the sample drops families that would not be eligible for transfer program benefits even if they did not work (because they fail asset tests). This elasticity calculation may be biased downward if the Keane and Moffitt model did not take into account other features of TRA86 (see note 2). That would make the implied average change in after-tax income smaller than $1,443, which would increase the elasticity estimate.

Note 4: The high end of the range of these estimates come from the study of Hausman (1981) who reported much larger elasticities than have been reported elsewhere. If instead, we focus on the mean parameters from the Negative Income Tax Studies and the preferred parameters from the study by Triest (1990), which adopts the Hausman methodology, Dickert, Houser and Scholz (1995) report labor supply responses to the 1993 EITC expansion (1993-96) of –0.54 to –1.17 percent. These range from –0.34 to –1.32 percent for husbands, -2.64 to -3.03 percent for wives and -1.08 to -1.11 percent for single women heads. See Table 2 of Dickert, Houser and Scholz (1995). Triest (1990) finds uncompensated wage elasticities of around 0.05 for men and 0.25 for women, and his estimates of virtual income elasticities are 0.0 for men and –0.15 for women.

Figure 1. The Earned Income Tax Credit for a Family with Two or More Children in 1979 and 1999



Notes:

[1] Subsidy rate.

[2] Benefit reduction (implicit tax) rate.

[3] Maximum benefit for two or more children.

Figure 2a: Taxes and Marginal Rates, Family of 4, Illinois, 1998

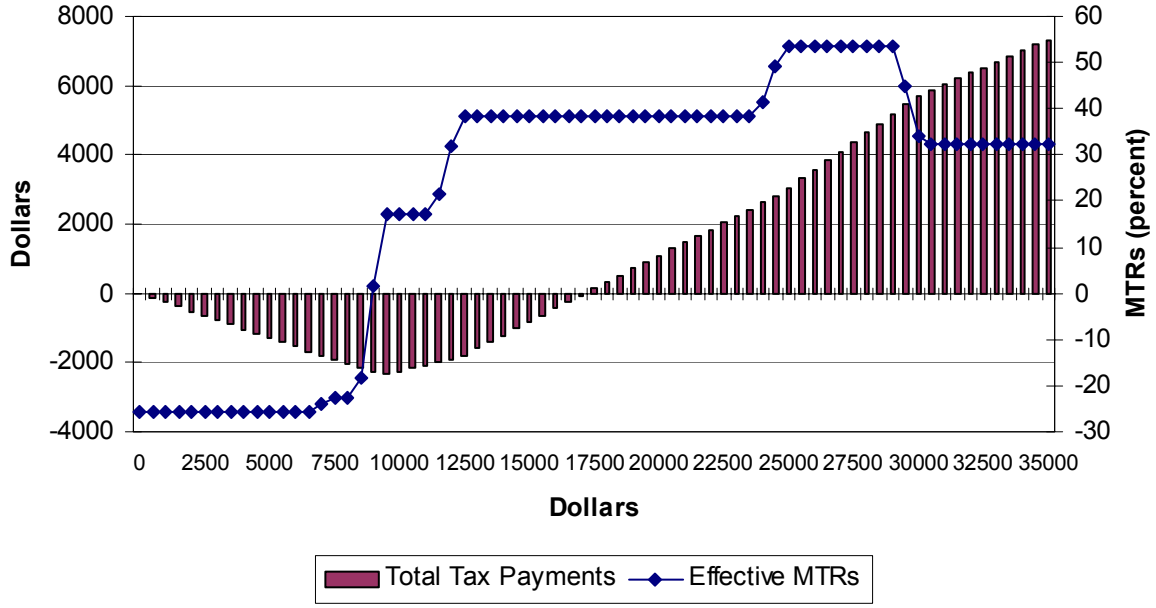


Figure 2b: Taxes and Marginal Rates, Family of 4, Illinois, 1984

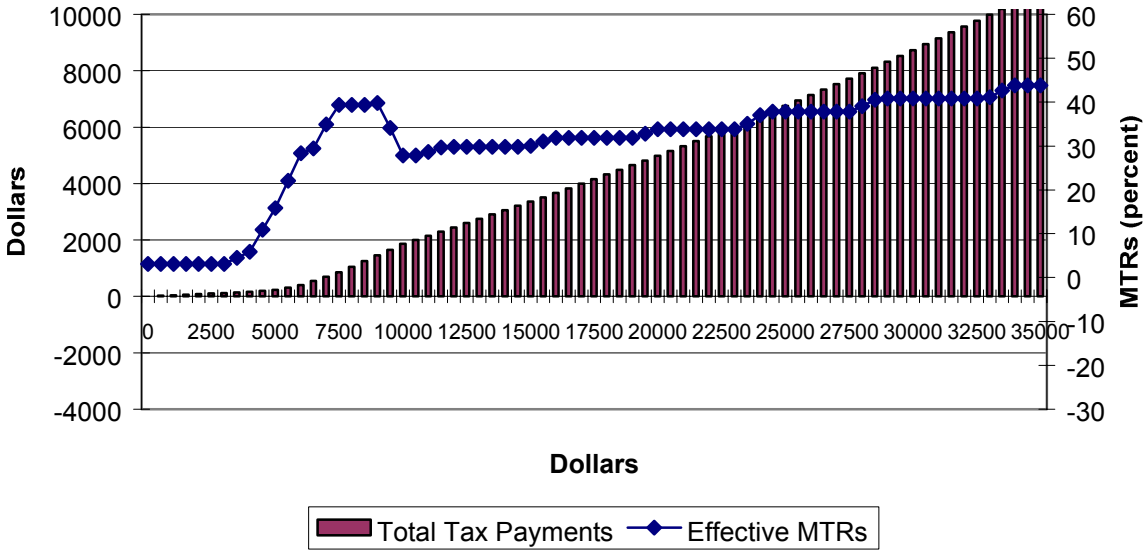
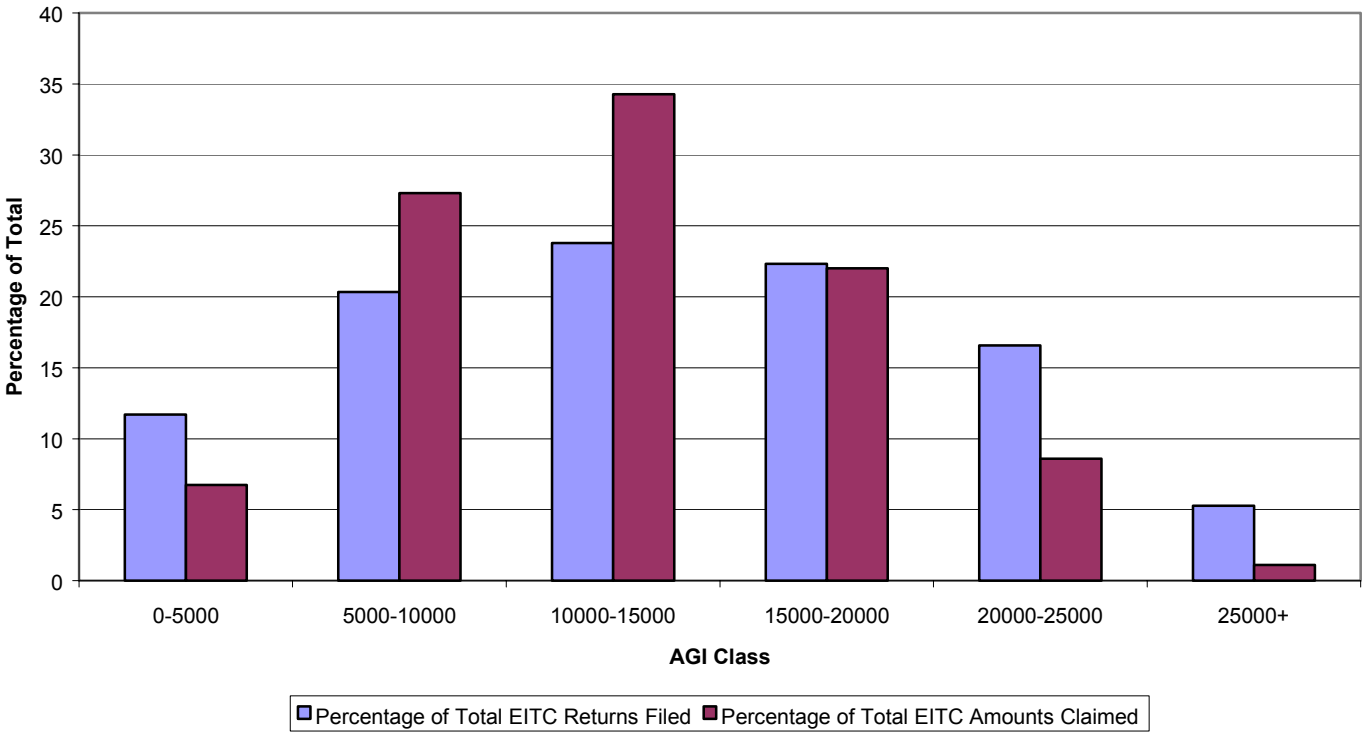


Figure 3: Distribution of Total EITC Returns and EITC Payments of Families with Children, by AGI, 1997



Source: http://www.irs.ustreas.gov/prod/tax_stats/soi/ind_gss.html, (97INDTR.EXE, 97in04ag.xls, posted 12-28-99), "Individual Income Tax Returns, 1997" and authors' calculations.

Figure 4: Effects of the EITC on Labor Force Participation and Hours of Work

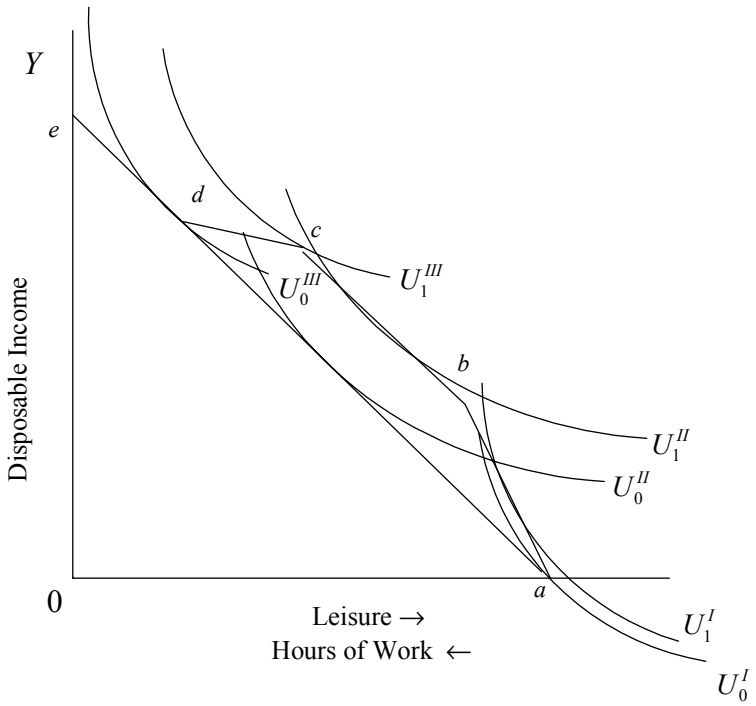
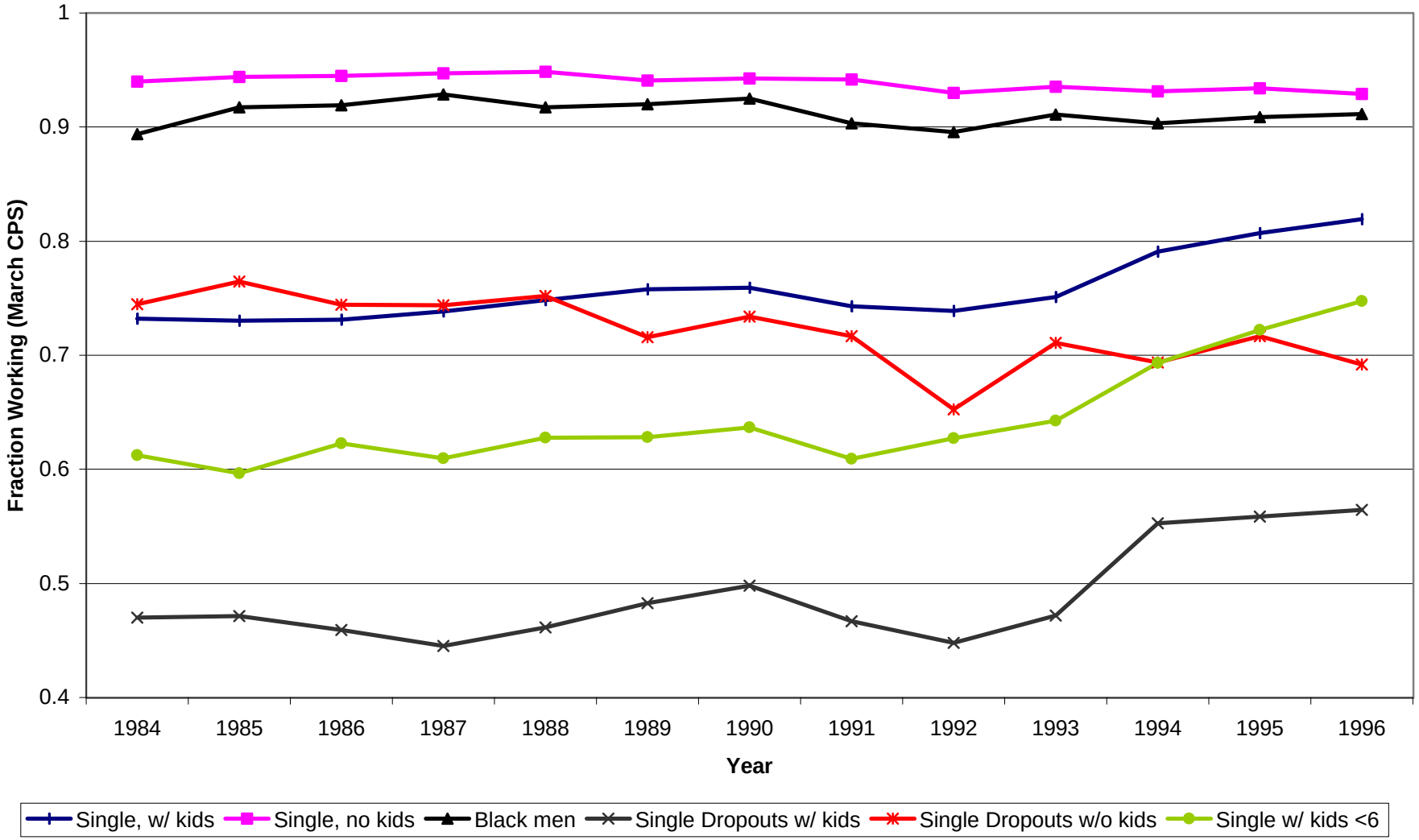


Figure 5: Labor Force Participation Rates, 1984-1996, March CPS, From Meyer and Rosenbaum (1999b)



References

Allingham, M. and Agar Sandmo, 1972, "Income Tax Evasion: A Theoretical Analysis," Journal of Public Economics, 1:3/4, 323-338

Alm, James and Leslie A. Whittington, 1995, "Does the Income Tax Affect Marital Decision?" National Tax Journal, 48(4), 565-572

Andreoni, James, 1992, "IRS as Loan Shark: Tax Compliance with Borrowing Constraints," Journal of Public Economics, 49(3), 35-46

Angrist, Joshua and Alan Krueger, 1999. "Empirical Strategies in Labor Economics," in Handbook of Labor Economics, O. Ashenfelter and D. Card, eds., Vol. 3A, 1999.

Attanasio, Orazio and Thomas MaCurdy, 1997, "Interactions in Family Labor Supply and Their Implications for the Impact of the EITC," Mimeo, Stanford University.

Barrow, Lisa and Leslie McGranahan, 2000, "The Effects of the Earned Income Tax Credit on the Seasonality of Household Expenditures," mimeo, Federal Reserve Bank of Chicago, April

Becker, Gary, 1964, Human Capital, New York: Columbia University Press

Ben Porath, Yoram, 1967, "The Production of Human Capital and Life-Cycle Earnings," Journal of Political Economy, 75(4), 352-365

Bishop, John and Robert Haveman, 1978, "Targeted Employment Subsidies: Issue of Structure and Design," Institute for Research on Poverty, Special Report #24

Blumenthal, Marsha, Brian Erard and Chih-Chin Ho, 1999, "Participation and Compliance with the Earned Income Tax Credit," mimeo

Blundell, R., A. Duncan, and C. Meghir, 1998, "Estimation of Labour Supply Responses using Tax Policy Reforms," Econometrica, 66(4), 827-61.

Blundell, Richard and Thomas MaCurdy, 1999, "Labor Supply: A Review of Alternative Approaches," in Handbook of Labor Economics, O. Ashenfelter and D. Card, eds., Vol. 3A, 1999, 1560-1695.

Blundell, Richard, Alan Duncan, Julian McCrae and Costas Meghir, 1999, "Evaluating In-Work Benefit Reform: the Working Families Tax Credit in the UK," mimeo, University College London and Institute for Fiscal Studies, November

Browning, Edgar, 1995, "Effects of the Earned Income Tax Credit on Income and Welfare," National Tax Journal, XLVIII, 23-43.

Browning, Martin (1992), "Children and Economic Household Behavior," Journal of Economic Literature, 30(3), pp. 1434-75

Bull, Nicholas, Janet Holtzblatt, James R. Nunns and Robert Rebelein, 1999, "Defining and Measuring Marriage Penalties and Bonuses," OTA Paper 82-R, U.S. Treasury Department

Burkhauser, Richard V., Kenneth A. Couch and Andrew Glenn, 1996, "Public Policies for the Working Poor: The Earned Income Tax Credit Versus Minimum Wage Legislation," Research in Labor Economics, S. Polachek (ed.), JAI Press

Cherry, Robert and Max B. Sawicky, 2000, "Giving Tax Credit Where Credit is Due," Economic Policy Institute Briefing Paper

Cossa, Ricardo, James J. Heckman and Lance Lochner, 1999, "Wage Subsidies and Skill Formation: A Study of the Earned Income Tax Credit," manuscript, University of Chicago, May

Council of Economic Advisers, 1998, "Good News for Low Income Families: Expansions in the Earned Income Tax Credit and the Minimum Wage," Washington, D.C., December

Council of Economic Advisers, 2000, Economic Report of the President, Washington, D.C., February

DeParle, Jason, 1999, "Once a Forlorn Avenue, Tax Preparers Now Flourish," New York Times, 3/21, p. 1

Dickert, Stacy, Scott Houser and John Karl Scholz, 1995, "The Earned Income Tax Credit and Transfer Programs: A Study of Labor Market and Program Participation," Tax Policy and the Economy, James M. Poterba (ed.), National Bureau of Economic Research and the MIT Press, 9, 1-50

Dickert-Conlin, Stacy and Amitabh Chandra, 1999, "Taxes and the Timing of Births," Journal of Political Economy, 107(1), 161-177

Dickert-Conlin, Stacy and Scott Houser, 1998, "Taxes and transfers: A new look at the marriage penalty," National Tax Journal, 51(2), 175-217.

Dickert-Conlin, Stacy and Scott Houser, 1999, "EITC and the Female Headship Decision," Institute for Research on Poverty Working Paper #1192-99.

Dickert-Conlin, Stacy, 1999, "Taxes and transfers: their effects on the decision to end a marriage," Journal of Public Economics, 73, pp. 217-240.

Eissa, Nada and Hilary Williamson Hoynes, 1998, "The Earned Income Tax Credit and the Labor Supply of Married Couples," NBER Working Paper #6856.

Eissa, Nada and Hilary Williamson Hoynes, 1999, "Good News for Low Income Families? Tax-Transfer Schemes and Marriage," mimeo, University of California, Berkeley.

Eissa, Nada and Jeffrey B. Liebman, 1996, "Labor Supply Response to the Earned Income Tax Credit, Quarterly Journal of Economics, May, 605-637

Ellwood, David T., 1988, Poor Support, Basic Books.

Ellwood, David T., 1999, "The Impact of the EITC on Work and Social Policy Reforms on Work, Marriage, and Living Arrangements," mimeo, Kennedy School of Government, November.

Ellwood, David T. and Jeffrey B. Liebman, 2000, "The Middle Class Parent Penalty: Child Benefits in the U.S. Tax Code," mimeo, John F. Kennedy School of Government, Harvard University, May

Feenberg, Daniel and Harvey Rosen, 1987, "The Marriage Tax is Down But Not Out," National Tax Journal, December, 567-575

Feenberg, Daniel Richard, and Elizabeth Coutts, 1993, "An Introduction to the TAXSIM Model," Journal of Policy Analysis and Management 12(1), Winter, 189-194 and http://www.nber.org/taxsim

Flood, Lennart and Thomas MaCurdy, 1993, "Work Disincentive Effects of Taxes: An Empirical Analysis of Swedish Men," mimeo, Stanford University.

Hausman, Jerry, 1985, "Taxes and Labor Supply," in Handbook of Public Economics, A. Auerbach and M. Feldstein, eds.

Haveman, Robert, 1996, "Reducing Poverty while Increasing Employment: A Primer on Alternative Strategies, and a Blueprint," OECD Economic Studies, 26, 7-42

Heckman, James J., 1979, "Sample Selection Bias as a Specification Error," Econometrica, 74, 153-161.

Heckman, James J., 1993, "What Has Been Learned About Labor Supply in the Past Twenty Years?" American Economic Review Papers and Proceedings, 116-121

Hill, Carolyn J., V. Joseph Hotz, Charles H. Mullin, and John Karl Scholz, 1999, "EITC Eligibility, Participation and Compliance Rates for AFDC Households: Evidence from the California Caseload," final report for the State of California, University of California, Los Angeles, April

Hoffman, Saul D. and Laurence S. Seidman, 1990, The Earned Income Tax Credit: Antipoverty Effectiveness and Labor Market Effects, W.E. Upjohn Institute for Employment Research

Holtzblatt, Janet, 1991, "Administering Refundable Tax Credits: Lessons from the EITC Experience," Proceedings of the Eighty-Fourth Annual Conference on Taxation, National Tax Association 180-186

Holtzblatt, Janet and Janet McCubbin and Robert Gillette, 1994, "Promoting Work Through the EITC," National Tax Journal, September, 47(3), 591-607

Holtzblatt, Janet and Jeffrey B. Liebman, 1998, "The EITC Abroad: Implications of the British Working Families Tax Credit for Pay-As-You-Earn Administration of the EITC," National Tax Journal, September

Holtzblatt, Janet and Robert Rebelein, 1999, "Measuring the Effect of the EITC on Marriage Penalties and Bonuses," mimeo, Treasury Department, November

Hoynes, Hilary, 1997, "Does Welfare Play and Role in Female Headship Decision?" Journal of Public Economics, 65(2), 89-117

Internal Revenue Service, 1996, "Federal Tax Compliance Research: Individual Income Tax Gap Estimates for 1985, 1988, and 1992," Publication 1415 (Rev. 4-96), Washington, D.C.

Internal Revenue Service, 1997, "Study of EITC Filers for Tax Year 1994," April, Washington, D.C.

Internal Revenue Service, 1999, "Individual Income Tax Returns, 1997" http://www.irs.ustreas.gov/prod/tax_stats/soi/ind_gss.html, (97INDTR.EXE, 97in04ag.xls, posted 12-28-99)

Jappelli, Tullio, 1990, "Who is Credit Constrained in the U.S. Economy?" Quarterly Journal of Economics, 105(1), 219-234

Jappelli, Tullio, Jorn-Steffen Pischke, and Nicholas S. Souleles, 1998, "Testing for Liquidity Constraints in Euler Equations with Complementary Data Sources," Review of Economics and Statistics, 80(2), 251-262

Johnson, Nicholas, 1999, "A Hand Up: How State Earned Income Tax Credits Help Working Poor Families Escape Poverty," Center on Budget and Policy Priorities

Keane, Michael P., 1995, "A New Idea for Welfare Reform," Federal Reserve Bank of Minneapolis Quarterly Review, 19(2), Spring, 2-28

Keane, Michael and Robert Moffitt, 1998, "A Structural Model of Multiple Welfare Program Participation and Labor Supply," International Economic Review, 39(3), 553-589.

Killingsworth, M. and J. Heckman, 1986, "Labor Supply of Women," in Ashenfelter and Layard (eds.) Handbook of Labor Economics, Vol. 1, 1986.

Killingsworth, Mark, 2000, "Wage Rate Subsidies," this volume

Liebman, Jeffrey B., 1999a, "Who Are the Ineligible EITC Recipients?" mimeo, Kennedy School of Government, October 2

Liebman, Jeffrey B., 1999b, "The Optimal Design of the Earned Income Tax Credit," mimeo, Kennedy School of Government

Liebman, Jeffrey, 1997a, "The Impact of the Earned Income Tax Credit on Incentives and Income Distribution," Tax Policy and the Economy,

Liebman, Jeffrey B., 1997b, "Noncompliance and the Earned Income Tax Credit: Taxpayer Error or Taxpayer Fraud?" mimeo, August 23

McCubbin, Janet, 1999, "EITC NonCompliance: The Misreporting of Children and the Size of the EITC," mimeo, November 15, Treasury Department

Meyer, Bruce D., 1995, "Natural and Quasi-Experiments in Economics," Journal of Business and Economic Statistics, 13(2), 151-161.

Meyer, Bruce D. and Dan T. Rosenbaum, 1999a, "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers," NBER Working Paper 7363, September

Meyer, Bruce D. and Dan T. Rosenbaum, 1999b, "Making Single Mothers Work: Recent Tax and Welfare Policy and Its Effects," manuscript, Northwestern University, December

Moffitt, Robert, 1990, "The Econometrics of Kinked Budget Constraints," Journal of Economic Perspectives, 4(2), Spring, 119-139.

Moffitt, Robert, 1992, "Incentive Effects of the U. S. Welfare System: A Review," Journal of Economic Literature," 30, pp. 1-61.

Moffitt, Robert A., 1998, "The Effect of Welfare on Marriage and Fertility," in Welfare, the Family and Reproductive Behavior, R. Moffitt (ed.), National Academy Press, 50-97

Moffitt, Robert A., 1999, "The Effect of Pre-PRWORA Waivers on AFDC Caseloads and Female Earnings, Income, and Labor Force Behavior," manuscript, Johns Hopkins University, May

Moffitt, Robert and Mark Wilhelm, forthcoming, "Taxation and the Labor Supply Decisions of the Affluent," in Does Atlas Shrug? The Economic Consequences of Taxing the Rich, edited by Joel Slemrod, Harvard University Press

Neumark, David and William Wascher, 2000, "Using the EITC to Help Poor Families: New Evidence and a Comparison with the Minimum Wage," NBER Working Paper #7599, March

Pencavel, John, 1986, "Labor Supply of Men: A Survey," in The Handbook of Labor Economics, Vol. 1, 1986.

Romich, Jennifer and Thomas Weisner, 1999, "How Families View and Use the EITC: The Case for Lump-sum Delivery," mimeo, November 15, Northwestern and UCLA

Scholz, John Karl, 1994, "The Earned Income Tax Credit: Participation, Compliance, and Anti-poverty Effectiveness," National Tax Journal, March, 59-81

Scholz, John Karl, 1996, "In-Work Benefits in the United States: The Earned Income Tax Credit," Economic Journal, Vol. 106, January, 156-169

Scholz, John Karl, 1997, "Testimony for the House Ways and Means Committee," May 8

Scholz, John Karl and Kara Levine, 2000, "The Evolution of Income Support Policy," mimeo, University of Wisconsin – Madison, May

Smeeding, Timothy M., Katherine Ross-Phillips, Michael O'Connor and Michael Simon, 1999, "The EITC: Knowledge, Use and Economic and Social Mobility" mimeo, Syracuse University, December

Souleles, Nicholas S., 1999, "The Response of Household Consumption to Income Tax Refunds," American Economic Review, September, 947-958

Steuerle, C. Eugene, 1991, "The 'Superterranean' Economy," Tax Notes, May 6, 647

Surrey, Stanley, 1973, Pathways to Tax Reform: The Concept of Tax Expenditures, Harvard University Press

Thaler, Richard H., 1994, "Psychology and Savings Policies," American Economic Review Papers and Proceedings, 186-192

Triest, Robert, 1992, "The Effect of Income Taxation on Labor Supply in the United States," Journal of Human Resources, XXV, 491-516.

U.S. Congressional Budget Office, 1997, "For Better or Worse: Marriage and the Federal Income Tax," June, Washington, D.C.

U.S. General Accounting Office, 1993, "Earned Income Tax Credit: Design and Administration Could be Improved," GAO/GGD-93-145, Washington, D.C.

U.S. General Accounting Office, 1998, "Earned Income Tax Credit: IRS' Tax Year 1994 Compliance Study and Recent Efforts to Reduce NonCompliance," GAO/GGD-98-150, Washington, D.C.

U.S. General Accounting Office, 2000, "Financial Audit: IRS' Fiscal Year 1999 Financial Statements," GAO/AIMD-00-76, Washington, D.C.

Ventry, Dennis, 1999, "The Collusion of Tax and Welfare Politics: The Political History of the Earned Income Tax Credit 1969-1999," mimeo, U.C. Santa Barbara

Weiss, Yoram, 1972, "One the Optimal Lifetime Pattern of Labour Supply," Economic Journal, 82(328), 1293-1315.

Whittington, Leslie A., James Alm, and H. Elizabeth Peters, 1990, "Fertility and the Personal Exemption: Implicit Pronatalist Policy in the United States, American Economic Review, 80(3), June 1990: 545-556.