

# Participation and Compliance with the Earned Income Tax Credit

**Abstract** - We explore participation and compliance with the Earned Income Tax Credit (EITC) using a unique administrative data source. Among eligible households with a legal filing requirement, we find that EITC participation is high and that it responded positively to the rise in real benefit amounts during the 1990s. Although participation has also improved among households with no legal filing obligation, it remains rather low and may actually be inferior to participation within more traditional welfare programs. Compliance with the EITC has been a persistent problem. We find that erroneous claims are much more common among households who satisfy some (but not all) program requirements. We find no evidence of a deterrent role by tax practitioners with respect to improper claims.

## INTRODUCTION

As the nation's largest cash transfer program for low and moderate income families, the U.S. Earned Income Tax Credit (EITC) delivers over \$38 billion annually to nearly 22 million households. The program has been heralded for its anti-poverty effectiveness, lifting more than four million people out of poverty each year, including well over two million children.<sup>1</sup> The dramatic expansion of EITC benefits during the 1990s was a hallmark of the Clinton Administration's welfare reform initiatives. Expansions of the program in recent years have been more modest; however, the EITC continues to have rather broad support from across the political spectrum. While popular, the program has been plagued by persistent compliance problems, with millions of claimants each year receiving benefits to which they are not entitled. For instance, an Internal Revenue Service (IRS) study of EITC claims on tax year 1999 returns (Internal Revenue Service, 2002) reports excess claims of between \$9.65 billion and \$11.12 billion, representing from 30.9 percent to 35.5 percent of total claims.

In this paper, we undertake an econometric analysis of the factors that influence EITC participation and compliance using a unique administrative data source that contains detailed information on eligible and ineligible claimants as well as eligible non-claimants. This information is based on random

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<sup>1</sup> Computed from U.S. Census Bureau (2000, Table 5, p. 28).

IRS examinations that were conducted of both filers and nonfilers of federal individual income tax returns.

Participation in the EITC requires filing an individual income tax return and completing the application for the credit that is included on the return. To our knowledge, ours is the first study to explicitly measure the impact of credit eligibility on a household's propensity to file a return. It is also the first to assess the determinants of whether an eligible filer actually claims the EITC. This is important, because hundreds of thousands of eligible filers fail to claim the credit each year.

Ineligible households made over one-third of all EITC claims in tax year 1988, and claims by ineligible households remain a significant problem today. In our econometric analysis, we explore what factors drive ineligible households to claim the EITC. In contrast to prior econometric work in this area, we examine whether households that meet some (but not all) of the conditions required for the credit are relatively more likely to submit an improper claim. Our hypothesis is that such households are more likely to misperceive that they are eligible for the EITC than households that clearly do not meet any of the eligibility requirements. Moreover, some households that are inclined to cheat may perceive that satisfying at least some of the program requirements will permit them to feign that their transgression was an "honest error" in the event that they are caught.

Our study is also unique in that we examine the impact of tax practitioners on EITC participation and compliance. Over 60 percent of all EITC claimants use some form of paid or unpaid assistance in preparing their returns. Given their expertise and the extensive reliance of households on their services, tax practitioners have the potential to yield very substantial influence on EITC participation and compliance behavior. Yet little is known about the actual extent to which prac-

tioners promote participation among eligible families or discourage improper claims among ineligible households. To learn about these issues, we perform a joint econometric analysis of the decisions whether to file a federal income tax return, seek preparation assistance, and/or claim the EITC.

Our econometric analysis focuses on households that are legally obliged to file a tax return—a group that represents an estimated three-fourths of the overall EITC-eligible population. The chief disadvantage of our data is that they pertain to tax year 1988. Although this enhances comparability with several key studies of EITC participation and compliance that were based on data of a similar vintage, the EITC program has changed in a number of important ways in more recent years. Nevertheless, we believe that our analysis is still relevant for understanding the incentives facing households to participate and comply with tax administered benefit programs, and for measuring the degree to which households respond to those incentives. We are able to show, for example, that our model is successful in capturing the impact of the various substantial program changes between tax years 1988 and 1999 on the propensity for eligible households to file and claim the EITC.

Although our econometric analysis focuses on households with a legal filing requirement, we use supplemental survey information to develop estimates of EITC participation rates for households both with and without a filing obligation. Our results provide new insight into the higher overall participation rate of the EITC vis-à-vis more traditional welfare programs, and they cast doubt on the notion that the EITC is universally more effective in reaching needy families.

The remainder of this paper is organized as follows. We begin by providing a brief overview of the EITC program. Next, we present our econometric framework

for jointly analyzing the decisions whether to file a federal individual income tax return, whether to seek preparation assistance, and whether to claim the EITC. We then describe our data, and present and interpret the results of our econometric analysis. Estimates are then developed of the overall EITC participation rates for households with and without a legal filing obligation. Next, we use our econometric results to simulate the effects of the dramatic expansion in EITC benefits and other changes between tax years 1988 and 1999 on the level of program participation. The final section offers some concluding remarks. An appendix provides supplementary information on our simulation methodology.

#### OVERVIEW OF THE EARNED INCOME TAX CREDIT

In this section, we provide a brief overview of essential features of the EITC for purposes of our analysis. For a more detailed discussion of the program, we refer the reader to Ventry (2000) or Hotz and Scholz (2003).

The federal tax system has included an Earned Income Tax Credit since 1975. Originally set up to offset the employer and employee portions of the payroll tax for low- and moderate-income working families, the credit was subject to major expansions in 1986, 1990, and 1993, as well as a more modest expansion in 2001. The EITC is administered as a refundable tax credit, which means that a family receives the full value of the credit even if the credit amount exceeds the family's income tax liability.

The value of the credit varies with a family's earned income. Beginning at the low end of the income distribution, the value of the credit first increases

with earned income, then levels off, and then declines until it ultimately has been phased out altogether once income reaches a specified threshold. For example, in tax year 1988—the year of the data used in our econometric analysis—an eligible household with one or more qualifying children received a 14 percent credit over its first \$6,225 of earned income, at which point the credit reached a maximum of \$874. The credit then remained level until earned income exceeded \$9,850, whereafter it was phased out at a rate of ten percent, until it disappeared entirely once earned income or adjusted gross income (AGI) reached \$18,576.<sup>2</sup>

By tax year 1999—the year of our simulation of program participation—the real value of the credit had increased substantially, been indexed to inflation, and varied according to the number of qualifying children in the household. In this year, an eligible household with one qualifying child received a 34 percent credit over its first \$6,800 of income, at which point the credit reached a maximum of \$2,312. The credit then remained level until earned income exceeded \$12,460, whereafter it was phased out at a rate of 15.98 percent, until it disappeared entirely once earned income or a modified definition of AGI reached \$26,928. The credit was substantially larger for an eligible household with two or more qualifying children, providing a maximum benefit of \$3,816.

Prior to 1990, the credit was restricted to households whose federal filing status was either married filing joint (and claiming a dependent child), head of household, or surviving spouse. While familiar and deceptively simple, these different filing statuses unfortunately implied different eligibility criteria, breeding confusion and inequity. For example, a married

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<sup>2</sup> If a household's AGI exceeded a specified threshold, the household was required to separately apply the credit formula using earned income and AGI. The household then received the lesser of the two credit amounts so-computed. A comparable rule remains in place today.

couple could qualify if it provided over half of the costs of supporting a child, regardless of whether that child resided with or was even related to the couple (e.g., a foster child). In contrast, a head of household had to provide over half of the larger costs of maintaining a household in which a child resided, a requirement that many divorced mothers could not meet (Yin, 1996). On the other hand, a widowed or divorced parent could qualify even if her son or daughter was a self-supporting adult (Holtzblatt, 1991). Responding to these anomalies, Congress in 1990 adopted a uniform definition of family responsibility, limiting the credit to those households with a child of a certain age and relationship who resided with the filer for more than half of the year.<sup>3</sup>

Since tax year 1994, a small credit has also been available for working individuals with no children. However, our analysis of the EITC concerns only the portion of the credit that applies to families with children.

#### ECONOMETRIC FRAMEWORK

In this section we develop an econometric model of EITC participation and compliance that accounts for how eligible and ineligible households make decisions regarding whether to file a return, seek tax preparation assistance, and/or claim the EITC.

Encouraging program participation is always an important objective in administering social welfare programs. In the case of a refundable tax credit program, such as the EITC, the principal challenge is to encourage low-income families to file a federal income tax return so that they can receive their benefits. However, a significant number of eligible filers also fail to participate in the EITC by not claiming the credit on their returns. In contrast to

previous EITC research that has focused exclusively on filing behavior, our econometric framework allows us to jointly examine the determinants of whether a household files a return and whether it claims the EITC.

Another important objective in administering social welfare programs is to discourage ineligible households from claiming benefits. We, therefore, build into our econometric framework an analysis of the factors that lead to the submission of EITC claims by ineligible households.

Although a large percentage of households rely on tax practitioners for assistance with understanding and claiming the EITC, past research has not addressed the potentially influential role that tax practitioners may play in either promoting participation among eligible households or discouraging improper claims among those who are ineligible. To explore these issues, we jointly model the decision whether to seek tax preparation assistance with the decisions whether to file and claim the EITC.

Our specification includes four equations:

$$[1] \quad F^* = \beta'_F X_F + \alpha A + \varepsilon_F;$$

$$[2] \quad P^* = \beta'_P X_P + \gamma E + \varepsilon_P;$$

$$[3] \quad C^*_E = \beta'_{CE} X_{CE} + \delta_{CE} P + \varepsilon_{CE};$$

$$[4] \quad C^*_{NE} = \beta'_{CNE} X_{CNE} + \delta_{CNE} P + \varepsilon_{CNE}.$$

Equation [1] represents a probit specification of the filing decision. The latent variable  $F^*$  represents the propensity for the household to file a federal individual income tax return. A return is filed if and only if  $F^* \geq 0$ .

Prior econometric studies have not accounted for the impact of EITC eligibility

<sup>3</sup> To qualify, the child must be less than 19 years old, unless disabled or a full-time student under 24, and must be the child, grandchild, foster child or stepchild of the claimant.

on filing behavior. In our specification, we explicitly include the amount of the credit to which a household is entitled (which, for ineligible households, is zero) as a regressor. This variable ( $A$ ) controls for the possibility that EITC-eligible households are relatively more likely to file a return, and it makes it possible for us to measure the responsiveness of filing to the magnitude of the credit. The symbol  $X_f$  refers to a vector of additional explanatory variables, and  $\varepsilon_f$  is a random normal disturbance term.

Each of the remaining equations is relevant only if the household elects to file a tax return. Equation [2] represents a probit specification of the filer's decision whether to seek assistance in preparing the return. The latent variable  $P^*$  represents the propensity for the household to seek assistance. We observe:

$$P = \begin{cases} 1 & \text{if return preparation} \\ & \text{assistance is employed;} \\ 0 & \text{otherwise.} \end{cases}$$

The term  $E$  represents a dummy variable for EITC eligibility and is defined as follows:

$$E = \begin{cases} 1 & \text{if the household is} \\ & \text{eligible for the EIC;} \\ 0 & \text{otherwise.} \end{cases}$$

We include  $E$  as a regressor to account for the possibility that eligible households have a different propensity to seek tax assistance than ineligible households. For instance, eligible households may seek assistance specifically to learn how to apply for the credit.<sup>4</sup> The symbol  $X_p$  refers to a vector of additional explanatory variables, and  $\varepsilon_p$  is a random normal disturbance term.

Equations [3] and [4] represent probit specifications for the decision to claim the credit for eligible and ineligible households, respectively. Our model amounts to an (exogenous) switching framework in which a household's decision whether to claim the credit is dictated by either equation [3] or equation [4], depending on whether the eligibility dummy  $E$  equals one or zero. We include the preparation mode dummy  $P$  as a regressor in these equations to explore whether tax practitioners effectively promote EITC participation among eligible households and/or discourage claims among ineligible households. To allow for the possibility that different factors influence claims by eligible and ineligible households, we specify distinct vectors of additional explanatory variables ( $X_{CE}$  and  $X_{CNE}$ ) and disturbance terms ( $\varepsilon_{CE}$  and  $\varepsilon_{CNE}$ ) for the two equations.

As is standard in probit specifications, we normalize the standard deviation of each of the disturbance terms in equations [1] through [4] to one. When modeling the decision whether to seek tax preparation assistance, it is important to recognize that households are not randomly assigned to a mode of tax preparation. Rather, they make their own choices. As a consequence, households that employ tax assistance may differ in unobserved ways from households that prepare their own returns. To control for possible sample selection, we allow free correlations ( $\rho_{FP}$ ,  $\rho_{PCE}$ , and  $\rho_{PCNE}$ ) between the preparation mode disturbance ( $\varepsilon_p$ ) and the disturbances of the filing ( $\varepsilon_f$ ) and claiming ( $\varepsilon_{CE}$  and  $\varepsilon_{CNE}$ ) equations. We also allow free correlations ( $\rho_{FCE}$  and  $\rho_{FCNE}$ ) between the disturbances of the filing and claiming equations to account for the possibility that unobserved factors that influence

<sup>4</sup> As an alternative to using an EITC eligibility dummy as a regressor, one might include the magnitude of the credit to which a household is entitled. We have not explored this option. We believe that eligibility is likely to be the key driving factor in the decision whether to seek tax assistance. Additionally, we are concerned that the household may not be fully aware of amount of the credit to which it is entitled. Indeed, this may be one of the reasons the household is seeking assistance.

the filing decision (e.g., awareness of the EITC) are also related to the decision to claim the credit.

#### *Model Identification*

Technically, our model would be identified, even in the absence of any exclusion restrictions, on the basis of the functional form and distributional assumptions we have imposed. However, it is clearly desirable to have a stronger basis for identification than this. As described below, we, therefore, impose certain exclusion restrictions to ensure that our model is identified under more general conditions.

Since households are observed in our data sample whether they file or not, no exclusion restrictions are needed to improve the identification of the filing equation. Likewise, we observe whether a tax practitioner has been used, regardless of whether the household claims the EITC. So, it is not necessary to exclude any of the regressors used in the claiming equations from the preparation mode equation. However, since we only observe whether a tax practitioner has been used if the household has filed a return, it is desirable for identification purposes to exclude at least one of the filing equation regressors from the preparation mode equation. For this same reason, it is desirable to exclude at least one of the filing equation regressors from each of the claiming equations. The regressors we have chosen to exclude from these equations are described below in our Results section.

#### DATA

The administrative data set we have compiled for this study has some important advantages over the survey and tax return data sources used in prior EITC studies. First, our data provide a direct indicator of whether a household actually claimed the credit. In contrast, prior researchers (Scholz, 1994 and 1996;

Liebman, 1996 and 2000) were able to infer participation only indirectly on the basis of whether an apparently eligible household filed a tax return. The distinction between filing and participation is an important one, because many eligible filers fail to claim the credit.

Second, we believe that our data allow us to assess EITC eligibility more accurately, which could lead to improved inferences about program take-up. Past studies of EITC participation have relied on national surveys, such as the Current Population Survey or the Survey of Income and Program Participation, to assess eligibility. This can be a daunting task, as it is difficult to assign filing status (particularly head-of-household status), to test for support of a child (or, post-1990, for the length of time the child resided in the household), and to measure adjusted gross income based on the available information. Moreover, there is no assurance that the millions of households that apparently misrepresent their EITC eligibility on their tax returns each year will be inclined to provide correct information on a survey. It seems plausible that errors made in assigning EITC eligibility (exclusions of eligible households and inclusions of ineligible ones) on the basis of survey results may tend to cancel out to some extent in aggregate participation rate statistics. However, even if this is the case, the errors in identifying truly eligible households might still result in misleading inferences regarding the determinants of participation behavior.

For our measure of EITC eligibility, we rely on the determination of an experienced IRS examiner who has performed a thorough audit of the household's tax return. Even tax examiners, of course, can fail to detect some improper claims. Further, some truly eligible households may have difficulty in substantiating their credit claim during an audit, perhaps due to poor record keep-

ing.<sup>5</sup> Overall, though, we feel our measure of eligibility represents a substantial improvement over the survey-based measures used in prior studies.

A disadvantage of our data is that we have access to only limited demographic information, such as marital status, whether the taxpayer is over 65 years of age, number of dependents, occupation, and state of residence. Therefore, we are unable to control for the impact of such factors as education, race, or receipt of public assistance on EITC participation and compliance.

Our data concerning filers and nonfilers have been derived from two separate data sets. The data for filers are taken from the IRS Taxpayer Compliance Measurement Program (TCMP) Phase III Survey. This survey contains the results of intensive line-by-line audits of a stratified random sample of approximately 54,000 individual income tax returns for tax year 1988. For most line items, both the amount that was reported by the filer and the amount that the examiner determined should have been reported are available. In addition, information is recorded about the prior filing history of the household, and a code is available for the primary filer's occupational category. The occupation code has been recorded by the IRS examiner, based on his assessment of the filer's main line of work. The data permit us to identify whether a filer claimed the EITC and, if so,

whether his claim was accepted or rejected during the audit. For filers who did not claim the credit, we are able to identify whether they were granted the credit by the examiner. A set of sample weights is included to make the data representative of the national return population.<sup>6</sup>

For our econometric analysis, we restrict our attention to households in the TCMP data sample that were required to file a tax year 1988 return. We do this to ensure consistency with our data on nonfilers, which is complete only for those individuals who were legally required to file a return but failed to do so. To identify whether a household was required to file a return, we have developed an algorithm that tests whether any of the conditions that require filing a federal income tax return is satisfied. A household was required to file a return in tax year 1988 if its gross income (excluding nontaxable sources of income) exceeded a threshold, which varied according to age and marital status. For example, a single individual under 65 years of age was required to file a return if his gross income exceeded \$4,950. In contrast, the threshold for a married couple with both spouses over 65 years of age was \$10,100.<sup>7</sup>

From our TCMP filer sample of households with a filing requirement, we have drawn for our analysis all returns of households eligible for the EITC, as well as a subsample of the returns for house-

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<sup>5</sup> For instance, the GAO (U.S. General Accounting Office, 1993) estimates that, of all households in the 1988 TCMP that were denied a dependent claim on the basis of failing the support test, 43 percent failed as a result of not having adequate records to demonstrate whether they provided the necessary support. The GAO speculates that some of these households may have met the support test if they had kept adequate records. The study also reports finding 51 cases in a sample of 958 returns where there was a discrepancy between certain information reported on the TCMP audit checksheets and the information coded on the TCMP computer file.

<sup>6</sup> The TCMP filer population excludes returns that were filed late as well as returns for non-resident taxpayers. In addition, the TCMP excludes those individuals who claimed a filing status other than married joint on their return, but were later assigned that filing status upon examination. We are, therefore, unable to examine the incidence of EITC compliance problems among such individuals in our analysis. McCubbin (2000) reports that about 7.8 percent of the total dollar value of EITC overclaims in tax year 1994 were made on returns involving a married joint filer who reported either head-of-household or single-filing status.

<sup>7</sup> Special rules applied for individuals who were claimed as a dependent on another tax return; owed certain taxes (such as those on tips not reported to an employer); received advance EITC payments; had net earnings from self-employment of at least \$400; or had wages of \$100 or more from a church or qualified church-controlled organization that was exempt from employer social security taxes.

holds that were not eligible. In particular, our sample includes all households that either claimed the EITC or received it following examination, as well as any other household with an AGI of \$30,000 or less. However, to simplify the computational burden of our maximum likelihood estimation procedure, we have included only a random 25 percent subsample of all non-claimants possessing an AGI of more than \$30,000. We have adjusted the sample weights accordingly.

Our data on nonfilers comes from the examination-based segment of the IRS TCMP Phase IX Nonfiler Survey. Beginning with a stratified random sample of 23,283 potential nonfilers from a population of 83 million individuals for whom there was no record of a tax year 1988 individual income tax return being filed,<sup>8</sup> revenue officers set out to locate each of the individuals in this sample to determine whether they should have filed a return. A total of 18,689 of the 23,283 potential nonfilers were successfully located through the search process. The revenue officers had access to information documents and past filing records. Armed with this information, they conducted interviews or field visits to determine whether a successfully located individual was required to file a return, i.e., whether the "potential nonfiler" was a "true nonfiler." Tax returns were secured from 3,546 individuals who were deemed to have been in violation of their tax filing requirements, and a random sample of 2,195 of these returns were subjected to intensive line-by-line audits, comparable to the audits performed for the TCMP Phase III study of individual return filers. We employ the details from these 2,195 examined returns in our analysis.

Since not all potential nonfilers in the original sample of 23,283 were located, it is highly likely that a number of true nonfilers went unidentified, including

some who would have been eligible for the EITC. To account for these unlocated true nonfilers, we have followed the same approach we used previously in our development of the IRS estimate of the nonfiler tax gap from these data. The first step is to perform a probit analysis of the likelihood that a potential nonfiler can be located. The probit equation takes the form:

$$[5] \quad L^* = \beta_L' X_L + \varepsilon_L,$$

where  $X_L$  represents a vector of regressors based on the information that was available to the revenue officer who attempted to locate the individual. Depending on the individual, information may have been available about the individual's age, whether a return had been filed for previous tax years, details concerning the individual's spouse, and details from information return documents. The parameter vector  $\beta_L$  represents the coefficients to be estimated, and  $\varepsilon_L$  is a standard normal disturbance term. The coefficients are estimated by the method of maximum likelihood and used to predict the probability that each individual can be located.

To make located true nonfilers broadly representative of all true nonfilers, we divide their original sample weights by their predicted chance of being located. The logic of this approach is as follows. Suppose members of a group of true nonfilers with similar characteristics each have a probability of, say, one half of being located. This suggests that for every member of the group that will be located, there is another member who will not be found. This is analogous to drawing a 50 percent random subsample of all members of the group. To make the located members representative of the entire group, the original sample weight of the located members is, therefore, divided

<sup>8</sup> Non-residents and individuals without valid social security numbers were excluded from the analysis.

by the implied sampling probability—in this case by one half. The interested reader is referred to Internal Revenue Service (1996, Appendix A) for further details on this approach.

In the aggregate, the expansion of sample weights using the above methodology increased our estimate of the number of EITC-eligible nonfilers by only 8.1 percent. This suggests that most of the eligible households in the original sample of 23,283 nonfilers were successfully located by the IRS revenue officers.

**RESULTS OF ESTIMATION**

In this section, we present the results of our analysis. We have estimated our econometric model using our sample of 32,601 households, including 30,406 filers and 2,195 nonfilers. The raw and weighted sample sizes, broken down by filing status, EITC eligibility, and whether the credit was claimed, are summarized in Table 1. We have estimated our model using the method of maximum likelihood. The likelihood function for our specification is available on request. The standard errors of our parameter estimates have been adjusted to account for the choice-based structure of our sample using the formula presented in Manski and Lerman (1977).

In those cases where there was a discrepancy in our data between the informa-

tion originally reported on a return by the taxpayer and the information recorded by the examiner, we have constructed our explanatory variables using information recorded by the examiner, which we deem to be more accurate.

*Description of Regressors*

Table 2 summarizes the regressors we employ in equations [1] to [4] of our model to explain the decisions whether to file a return, seek tax assistance, and (separately, for eligible and ineligible households) claim the credit.

Prior research has not measured the extent to which eligibility for the EITC impacts on the propensity to file a return. For instance, Scholz (1994) focused on filing behavior among households that appeared eligible for the credit based on their responses to survey questions regarding their income and demographic characteristics. His results, therefore, do not address whether eligible households are more likely to file a return than ineligible households. On the other hand, Erard and Ho (2001) explored filing behavior within a nationally representative sample containing both households that were eligible for the EITC and households that were not eligible. However, the authors did not include any regressors in their analysis to account for the additional incentive created by the EITC to file.

**TABLE 1**  
RAW AND WEIGHTED SAMPLE SIZES

Group	Status	Raw Sample Sizes	Population Counts Based on Weighted Sample Sizes (thousands)
Filers		30,406	95,081
	EITC-eligible	2,844	6,264
	Claimants	2,564	5,881
	Non-claimants	280	383
	Granted credit	181	312
	Not granted credit	99	71
	EITC-ineligible	27,562	88,818
	Claimants	1,520	2,903
Non-claimants	26,042	85,915	
Nonfilers		2,195	8,523
	EITC-eligible	197	347
	EITC-ineligible	1,998	8,176

**TABLE 2**  
LIST OF REGRESSORS

Regressor	File	Prep. Mode	Claim – Elig.	Claim – Inelig.
1987 Filer—dummy equal to 1 if household filed a federal income tax return for tax year 1987	X			
AGI—adjusted gross income divided by 100,000	X	X	X	X
IRP Income—dummy equal to 1 if household has any income subject to information reporting	X			
Schedule C—dummy equal to 1 if household has any Schedule C (self-employment) income	X	X	X	X
Schedule F—dummy equal to 1 if household has any Schedule F (farm) income	X	X	X	X
Unemployment Income—dummy equal to 1 if household has any unemployment insurance income	X	X	X	X
Age 65—dummy equal to 1 if either primary or secondary taxpayer is of age 65 or older	X	X	X	X
# Dependents—number of dependent exemptions	X	X	X	X
Income Tax State—dummy equal to 1 if reside in a state that has an income tax	X			
Filing Burden—estimated total # hours required to prepare and file return	X	X		
Near Filing Threshold—dummy equal to 1 if gross income is within 5 percent of the filing threshold	X	X		
Burden-Threshold Interaction—interaction between the preceding 2 variables	X	X		
Credit Amount—value of EITC credit household entitled to divided by 1,000	X		X	
EITC-Eligible—dummy equal to 1 if household is eligible for the EITC		X		
Single—dummy equal to 1 if filing status is single		X		X
Married Sep.—dummy equal to 1 if filing status is married separate		X		X
H.H./Qual. Wid.—dummy equal to 1 if filing status is head of household or qualifying widow		X	X	X
Married Joint—dummy equal to 1 if filing status is married joint	X			
Admin./Mgr./Super.—dummy equal to 1 if an administrator, manager, or supervisor	X			
Admin. Supp./Service/Transp.—dummy equal to 1 if employed in an administrative support, service, or transportation occupation	X			
Ag./For./Fishing—dummy equal to 1 if employed in an agricultural, forestry, or fishing occupation	X			
Mechanic/Helper—dummy variable equal to 1 if a mechanic, helper, or handler	X			
Constr./Extrac./Prod.—dummy equal to 1 if employed in a construction, extraction, or production trade	X			
Military—dummy equal to 1 if employed in the military	X			
Other Occupation—dummy equal to 1 if in any other occupation (excluding professionals—the omitted occupation category)	X			
EITC State—dummy equal to 1 if reside in a state with its own EITC		X	X	X
H.M.I. Deduction—dummy equal to 1 if home mortgage interest deduction claimed		X	X	X
Plateau Region Dummy—dummy equal to 1 if household income falls within the plateau region of the EITC schedule			X	
Phase-out Range Dummy—dummy equal to 1 if household income falls within the phase-out range of the EITC schedule			X	
Preparation Assistance—dummy equal to 1 if household received either paid or unpaid assistance in preparing its return			X	X
Passes Income Test—dummy equal to 1 if the levels of earned income and AGI are within the limits prescribed by the credit				X
Passes Child-at-Home Test—dummy equal to 1 if the filer is determined by the examiner to have a valid exemption for a dependent child at home				X
Income Test—Child-at-home test interaction—interaction between the preceding 2 variables				X

In our specification of the filing decision, we include essentially the same regressors employed by Erard and Ho (2001).<sup>9</sup> This includes measures of past filing behavior, the presence of income that is subject to information reporting, the burden associated with filing a return, occupation, and demographic characteristics. However, we also include the magnitude of the credit available to eligible households that file a return and claim the EITC. For ineligible households, this variable is set equal to zero. With this additional regressor, we are able to assess whether eligible households are relatively more likely to claim the credit and measure how the propensity to file varies with the magnitude of the credit.

The decisions regarding preparation mode and whether to claim the EITC are only relevant if the household chooses to file a return. We assume that certain regressors which influence whether a household chooses to file a return have no direct impact on these other decisions. These include our dummies for the presence of income subject to information reporting, past filing behavior, occupation, and residence in a state that imposes an income tax. Although arguments can be made for the inclusion of some of these variables in our specification of the preparation mode or claiming decisions, we believe that any influence of such variables is likely to be indirect, by way of their influence on filing behavior. Similarly, we account for the impact of the overall filing burden on the propensity to seek tax assistance, but we assume that the filing burden does not directly impact whether a filer claims the EITC.<sup>10</sup> As noted above, we assume that the propensity of an eligible household to claim the EITC is sensitive to the magnitude of the credit, but that the decision

whether to seek tax assistance is primarily driven by whether the household is eligible for the credit.

Our specifications of the preparation mode decision and the EITC claiming decision for ineligible households include a broader set of filing status dummies than our specifications of the filing decision and the EITC claiming decision for eligible households. In the earlier study of filing behavior by Erard and Ho (2001), married joint was the only filing status that was found to be statistically significant. With regard to our EITC claiming specification for eligible households, we do not include a broader set of filing status dummies, because households with single or married separate filing status were not permitted to take the credit.

Raw EITC participation rates estimated by Liebman (1996) vary according to whether a household is in the phase-in, plateau, or phase-out regions of the credit. To assess whether these differences persist even after controlling for the magnitude of the credit and other factors thought to influence participation, we include dummies for presence in the plateau and phase-out regions as regressors in our specification of the claiming decision for eligible households.

For ineligible households, our EITC claiming equation includes dummies for whether a household meets certain key EITC eligibility requirements. Our hypothesis is that ineligible households that meet some of these requirements will be more prone to making improper claims. This may be due either to a higher propensity for unintentional errors or a belief among dishonest filers that any false claims discovered by the IRS are more likely to be perceived as unintentional errors in such cases.

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<sup>9</sup> Erard and Ho (2001) used a somewhat different econometric framework that led to the inclusion of an index of "locatability" in their filing specification. As a proxy for this index, we include a dummy for whether the household has any income subject to information reporting.

<sup>10</sup> Our measure of filing burden excludes the burden associated with completing the EITC application on the tax return.

As discussed above in our Econometric Framework section, certain of the above exclusion restrictions aid in the identification of our model, but most of them are not needed for this purpose. More specifically, our fundamental exclusion restrictions for identification purposes are the exclusion of our measures of filing burden and the presence of income subject to third-party information reporting from the equations describing the decision whether to claim the EITC, and the exclusion of the dummy for income subject to third-party information reporting from our tax preparation mode specification.

Below, we discuss the results of our joint analysis of the decisions whether to file a return, to seek tax assistance, and to claim the EITC; results for the last decision are presented separately for eligible and ineligible households.

### *The Decision Whether to File*

Table 3 presents our estimated parameters for equation [1], which concerns the decision whether to file a 1988 tax return among individuals with a legal filing requirement. To assist with interpretation, the table also includes the estimated marginal effects based on the weighted mean values of the explanatory variables in our sample. Most of our regressors are dummy variables. In the case of a dummy explanatory variable, the marginal effect is computed as the change in the probability of filing when the variable shifts from zero to one, holding all other regressors constant.<sup>11</sup>

Our results are qualitatively very similar to those found by Erard and Ho (2001). Like this earlier study, the two most influential determinants of filing behavior in our analysis are whether the household filed in the prior year, and whether the IRS

TABLE 3  
FILING DECISION

Variable	Parameter Estimate	t-Statistic	Marginal Effect	t-Statistic
<i>Constant Term</i>	-1.3822	-8.502		
<i>1987 Filer</i>	1.9414	38.193	0.3517	24.663
<i>AGI</i>	0.0051	0.206	0.0002	0.206
<i>IRP Income</i>	1.6023	14.517	0.2812	7.450
<i>Schedule C</i>	-0.4207	-4.409	-0.0275	-3.253
<i>Schedule F</i>	0.0093	0.034	0.0004	0.034
<i>Admin./ Mgr./Super.</i>	-0.0020	-0.020	-0.0119	-2.177
<i>Admin. Supp./Service/Transp.</i>	0.3140	3.441	0.0076	3.100
<i>Ag./For./Fishing</i>	0.4363	1.875	0.0097	1.570
<i>Mechanic/Helper</i>	-0.3803	-4.110	-0.0506	-6.551
<i>Constr./Extrac./Prod.</i>	0.5066	3.508	0.0133	4.277
<i>Military</i>	0.0875	0.452	-0.0052	-0.492
<i>Other Occupation</i>	0.3035	3.671	0.0069	2.788
<i>Unemployment Income</i>	-0.1703	-2.027	-0.0095	-1.792
<i>Age 65</i>	-0.1200	-1.491	-0.0063	-1.364
<i># Dependents</i>	-0.0389	-1.124	-0.0019	-1.123
<i>Married Joint</i>	0.4803	6.230	0.0228	6.855
<i>Income Tax State</i>	0.0077	0.121	0.0004	0.120
<i>Filing Burden</i>	-0.0058	-1.464	-0.0003	-1.464
<i>Near Filing Threshold</i>	-0.0510	-0.565	-0.0025	-0.540
<i>Burden-Thresh. Interaction</i>	-0.0302	-3.201	-0.0014	-3.211
<i>Credit Amount</i>	0.5811	3.098	0.0279	3.031

Sample Size: 32,601

Likelihood Value for Full Model: -25,352.1

Omitted Occupation Category: Professionals

Note: Std. Errors were adjusted for choice-based sampling

<sup>11</sup> For an occupational dummy variable, the marginal effect represents the change in the filing probability from when that dummy is set equal to zero and all other occupational dummies are set equal to their sample mean values to when that dummy is set equal to one and all other occupational dummies are set equal to zero.

has access to information that identifies the household's address and whether it is likely to have a filing requirement. All else equal, we estimate that the likelihood of filing is 35 percentage points higher for a household that filed in the prior year. Likewise, it is 28 percentage points higher for a household that has income that is subject to third-party information reporting. Our results are also consistent with Erard and Ho's (2001) findings that the propensity to file varies across occupations, is relatively high among married couples, and declines with the magnitude of the filing burden (at least for households near the filing threshold).

In his analysis of filing behavior, Scholz (1994) restricted his attention to households that appeared eligible for the EITC. Relative to (seemingly) eligible filers, he found that (seemingly) eligible nonfilers were entitled to a smaller credit; received more of their income from self-employment and social security; had larger families; and were relatively more likely to be unmarried, of Spanish origin, living in states with no income taxes, receiving public assistance, and working in household service occupations (e.g., as housekeepers or child care workers).

Like Scholz (1994), we find that married couples are more likely to file a return and that self-employed individuals are less likely to do so. However, some of Scholz' results are inconsistent with our findings. For instance, we find no significant relationship between the propensity to file and either the size of the family (as indicated by the number of dependents) or residence in a state with no income tax. Moreover, we find that individuals working in service or administrative support occupations are more (not less) likely to file a return. We believe that these differences in results are largely attributable to differences in the populations covered by our respective analyses. For instance, whereas our sample contains both eligible and ineligible households,

Scholz' sample contains only eligible households. Furthermore, whereas our sample is restricted to households with a legal filing requirement, Scholz' sample also contains households with no filing obligation.

In contrast to the studies by Scholz (1994) and Erard and Ho (2001), we are able to assess the impact of EITC eligibility on a household's propensity to file. We estimate that an eligible household in tax year 1988 was entitled to an average credit of \$521. Evaluated at the mean characteristics of our sample, we estimate that the likelihood of filing would be 1.1 percentage points higher for a household that was eligible for a credit of this amount than a household that was not eligible (99.0 percent compared to 97.9 percent). However, the estimated impact of the EITC on the propensity to file varies greatly with the characteristics of the household. For example, if we evaluate at the mean characteristics of our subsample of households that did not file a return for the prior tax year, being eligible for a credit of \$521 raises the likelihood of filing by 11.7 percentage points (from 34.9 percent to 46.6 percent). Further evidence on the impact of the EITC on the propensity to file is presented below where we discuss the results of our simulation of the impact of the large expansion in the real value of the credit during the 1990s on program participation.

The estimated marginal effects presented for many of our explanatory variables in Table 3 are relatively small. To a substantial extent, this is also a consequence of their being evaluated at the weighted mean characteristics for the entire sample. The estimated probability of filing based on these mean characteristics is 98 percent. As discussed by Erard and Ho (2001), the marginal effects tend to be much larger when evaluated at the mean characteristics of nonfilers in the sample, who naturally have a substantially lower estimated filing probability.

*The Decision Whether to Seek Tax Assistance*

Table 4 presents our estimates of the parameters and marginal effects for equation [2], which concerns the propensity of a filer to seek tax preparation assistance. Nearly 60 percent of the filers in our weighted sample used some form of assistance in preparing their returns.<sup>12</sup> The marginal effects are evaluated based on the weighted mean characteristics of our sample of 30,406 filers.<sup>13</sup> The estimated probability of using preparation assistance for an individual with these characteristics is 60.9 percent.

Although it seems likely that households would seek the assistance of tax experts to learn about how to apply for the EITC, past studies of tax preparation mode have not accounted for this possibility.<sup>14</sup> Other factors equal, we find that the likelihood of seeking tax preparation

assistance is about seven percentage points higher among households that are eligible for the EITC.

Our analysis also includes an approximate measure of the filing burden based on an IRS study conducted by Arthur D. Little, Inc. The measure is computed by aggregating the estimated average completion times (including the time needed for record-keeping and research) associated with each form and schedule used by the taxpayer. Thus, in essence, it is a weighted number of forms and schedules, where the weights are the estimated completion times. Our results indicate that households are relatively more likely to seek tax preparation assistance when the filing burden is high.

Past studies have not controlled directly for filing burden, but, instead, have relied on proxies such as the presence of self-employment or farm income and the number

**TABLE 4**  
PREPARATION MODE DECISION

Variable	Parameter Estimate	t-Statistic	Marginal Effect	t-Statistic
<i>Constant Term</i>	-0.6649	-22.436		
<i>Schedule C</i>	-0.5703	-13.793	-0.2239	-13.961
<i>Schedule F</i>	-0.5908	-3.655	-0.2323	-3.770
<i>Unemployment Income</i>	0.1488	5.987	0.0560	6.125
<i>H.M.I. Deduction</i>	-0.3466	-13.177	-0.1351	-13.180
<i>Age 65</i>	0.3787	13.052	0.1374	14.017
<i># Dependents</i>	-0.0160	-1.644	-0.0061	-1.643
<i>Single</i>	0.1313	6.152	0.0448	5.682
<i>Married Sep.</i>	0.0705	1.379	0.0022	0.118
<i>H.H./Qual. Wid.</i>	0.0921	2.870	0.0113	0.917
<i>EITC State</i>	-0.0566	-1.316	-0.0219	-1.308
<i>AGI</i>	-0.0021	-0.283	-0.0008	-0.283
<i>Filing Burden</i>	0.0724	30.302	0.0278	31.072
<i>Near Filing Threshold</i>	-0.1144	-1.921	-0.0445	-1.902
<i>Burden-Threshold Interaction</i>	0.0285	3.105	0.0110	3.104
<i>EITC-Eligible</i>	0.1954	5.859	0.0729	6.050
<i>P<sub>EP</sub></i>	0.1614	2.350		

Sample number of filers: 30,406

Omitted Filing Status: Married joint

Note: Std. Errors were adjusted for choice-based sampling

<sup>12</sup> This includes paid and unpaid assistance; the latter category includes unpaid preparers as well as volunteer and IRS assistance.

<sup>13</sup> The dummy variables for filing status belong to a common group along with the omitted dummy for married joint status. The marginal effect for a dummy variable in this group is computed as the change in the probability of claiming the credit from when that variable is set equal to zero and all other dummies in the group are set equal to their sample mean values to when that variable is set equal to one and all other dummies in the group are set equal to zero.

<sup>14</sup> Refer to Erard (1993, 1997) for discussions of prior studies on the use of tax practitioners.

of forms and schedules that the filer needs to complete. Such studies have found that self-employed taxpayers and farmers are relatively more likely than other filers to seek tax preparation assistance. In contrast, after controlling explicitly for filing burden, we find that the likelihood of seeking preparation assistance is about 22 percentage points *lower* for filers with self-employment or farm income than it is for other filers.

We find that home ownership is also negatively associated with seeking tax preparation assistance. All else equal, the likelihood of using a preparer is about 13.5 percentage points lower for homeowners than it is for non-homeowners. In contrast, elderly, unmarried, and unemployed filers are relatively more likely to seek assistance. The level of adjusted gross income is not significantly associated with tax preparation mode, although low-income taxpayers who are near the filing threshold are relatively less likely to

seek preparation assistance so long as the filing burden is not unusually high.

*The Decision Whether to Claim the EITC (Eligible Filers)*

Table 5 presents our estimates of the parameters and marginal effects for equation [3], which concerns the propensity of an eligible filer to claim the EITC. In our choice-based data sample, 2,564 of the 2,844 eligible filers actually claimed the credit. The marginal effects are evaluated based on the weighted mean characteristics of these 2,844 filers.<sup>15</sup> The estimated probability of claiming the credit, evaluated at the sample mean, is 93 percent.

The results in Table 5 indicate that the magnitude and range of the credit are more relevant than the level of adjusted gross income in explaining which filers will claim the EITC and, hence, participate in the program. Although somewhat imprecisely estimated, the predicted

TABLE 5  
CLAIMING DECISION—ELIGIBLES

Variable	Parameter Estimate	t-Statistic	Marginal Effect	t-Statistic
<i>Constant</i>	1.3933	4.337		
<i>AGI</i>	0.1108	0.343	0.0148	0.342
<i>Plateau Region Dummy</i>	0.2353	0.833	0.0319	1.631
<i>Phase-out Range Dummy</i>	-0.0367	-0.160	-0.0260	-1.399
<i>Credit Amount (\$ thousands)</i>	0.6701	3.162	0.0895	3.373
<i>Schedule C</i>	-0.1106	-0.612	-0.0156	-0.620
<i>Schedule F</i>	-0.2000	-0.351	-0.0307	-0.315
<i>Unemployment Income</i>	0.0536	0.530	0.0070	0.541
<i>H.M.I. Deduction</i>	-0.0938	-0.500	-0.0133	-0.489
<i>Age 65</i>	-0.4453	-1.568	-0.0804	-1.414
<i># Dependents</i>	0.1128	1.525	0.0151	1.446
<i>EITC State</i>	0.0681	0.201	0.0087	0.213
<i>Preparation Assistance</i>	-0.6628	-1.600	-0.0803	-1.215
<i>H.H./Qual. Wid.</i>	-0.0693	-0.715	-0.0092	-0.752
$\rho_{FCE}$	-0.1155	-0.360		
$\rho_{PCE}$	0.6052	2.581		

Sample number of eligible filers: 2,844  
Omitted Filing Status: Married joint  
Omitted EITC Region: Phase-in range  
Note: Std. Errors were adjusted for choice-based sampling

<sup>15</sup> The plateau and phase-out region dummy variables belong to a common group along with the omitted dummy for the phase-in region of the credit. The marginal effect for a dummy variable in a group is computed as the change in the probability of claiming the credit from when that variable is set equal to zero and all other dummies in the group are set equal to their sample mean values to when that variable is set equal to one and all other dummies in the group are set equal to zero.

likelihood of submitting a claim is about three percentage points higher for eligible households whose income is in the plateau range of the credit (where the credit achieves its maximum value) than for households in the phase-in range. In addition, the propensity to submit a claim responds positively to the magnitude of the credit. Together, these findings indicate that the decision to claim the EITC is driven to an important extent by financial incentives. While the results also indicate that elderly individuals and households with self-employment or farm income are relatively less likely to claim a credit to which they are entitled, the standard errors indicate that the parameter estimates for these variables are very imprecise. Residence in a state that administers its own earned income tax credit has only a very small and statistically insignificant impact on the likelihood of claiming the credit.

The estimated coefficient of the tax preparation assistance dummy is negative, but statistically insignificant, suggesting that tax practitioners are not effective in promoting EITC participation among eligible households. The estimated correlation term  $\rho_{PCE}$  indicates that eligible households that seek assistance have unobserved characteristics that make them relatively more prone to claiming the credit than households that prepare their own returns. These results contrast sharply with what one would find in a standard cross-sectional model that did not account for self-selection of tax preparation mode. For instance, if the correlation  $\rho_{PCE}$  is restricted to zero in estimation—as it would implicitly be in such

a model—the constrained estimate of the preparation assistance dummy coefficient becomes positive and significant, indicating that tax practitioners do improve participation in the EITC among eligible households. Thus, the interpretation of the role of tax practitioners in promoting EITC participation depends critically on whether one accounts for unobserved heterogeneity between taxpayers who seek preparation assistance and taxpayers who prepare their own returns.

The estimated correlation between the disturbances of the filing and claiming equations  $\rho_{FCE}$  is negative, but statistically insignificant. This suggests that if eligible nonfilers were in fact to submit a return, their propensity to claim the credit might mirror that of eligible filers with similar observed characteristics.

#### *The Decision Whether to Claim the EITC (Ineligible Filers)*

Table 6 presents our estimated parameters and marginal effects for equation [4], which concerns the propensity of an ineligible filer to improperly claim the EITC. In our choice-based sample, 1,520 of the 27,562 ineligible filers claimed the credit. The marginal effects are evaluated based on the weighted mean characteristics of these 27,562 filers.<sup>16</sup> Our weighted results indicate that over one-third of the 10.3 million filers claiming the EITC in tax year 1988 were ineligible for the credit.<sup>17</sup>

As discussed above in our Description of Regressors subsection, our hypothesis is that ineligible households that satisfy some of the key EITC eligibility tests are more likely to submit an improper claim

<sup>16</sup> The filing status dummies in our specification belong to a common group along with the omitted dummy for married joint status. The marginal effect for a dummy variable in this group is computed as the change in the probability of claiming the credit from when that variable is set equal to zero and all other dummies in the group are set equal to their sample mean values to when that variable is set equal to one and all other dummies in the group are set equal to zero.

<sup>17</sup> This statistic includes all claimants, regardless of whether they were required to file. According to our TCMP tabulations, claimants with a filing requirement submitted 85.2 percent of all claims (eligible and ineligible combined) and 81.5 percent of ineligible claims.

Participation and Compliance with the Earned Income Tax Credit

TABLE 6  
CLAIMING DECISION—INELIGIBLES

Variable	Parameter Estimate	t-Statistic	Marginal Effect	t-Statistic
<i>Constant</i>	-3.0497	-24.097		
<i>Passes Income Test</i>	1.4208	11.966	0.0910	8.666
<i>Passes Child-at-Home Test</i>	0.6643	3.189	0.0280	2.365
<i>Income Test—Child-at-Home Test Interaction</i>	0.9624	4.726	0.0796	2.256
<i>AGI</i>	-0.0143	-0.502	-0.0004	-0.500
<i>Unemployment Income</i>	0.3610	5.789	0.0149	4.117
<i>H.M.I. Deduction</i>	-0.4340	-3.279	-0.0103	-3.744
<i>Schedule C</i>	0.1603	1.395	0.0053	1.203
<i>Schedule F</i>	0.0884	0.198	0.0028	0.180
<i>Age 65</i>	-0.7220	-4.682	-0.0120	-6.072
<i># Dependents</i>	0.0063	0.078	0.0002	0.078
<i>EITC State</i>	0.2296	1.899	0.0085	1.509
<i>Preparation Assistance</i>	0.5473	4.598	0.0148	3.469
<i>Single</i>	-0.1573	-2.005	-0.0054	-2.563
<i>Married Sep.</i>	0.3285	2.998	0.0175	2.836
<i>H.H./Qual. Wid.</i>	0.2257	1.477	0.0115	1.430
$\rho_{PCNE}$	0.2032	1.991		
$\rho_{PCNE}$	-0.3170	-4.239		

Sample number of ineligible filers: 27,562

Omitted Filing Status: Married joint

Note: Std. Errors were adjusted for choice-based sampling

for the credit than households that satisfy none of the tests. The results confirm that ineligible filers who pass the income test are much more likely to file a claim than those who do not. Similarly, the estimated parameter of the child-at-home test dummy indicates that those who pass the child-at-home test are relatively more likely to submit an improper claim. A filer who satisfies both the income and child-at-home tests may, nonetheless, be ineligible for the credit. For example, she would not have been eligible in tax year 1988 if her filing status was single or married filing separately; if she had claimed an exclusion for foreign-earned income; or if she was a non-custodial parent who had been granted the right to claim the dependent exemption under a divorce arrangement. The estimated interaction term parameter indicates that an ineligible filer who passes both the income and child-at-home tests is especially likely to claim the credit. Relative to a household that passes neither test, the likelihood of submitting an improper EITC claim is about 20 percentage points higher for a household that satisfies the conditions of both tests.

The level of adjusted gross income has no significant impact on the likelihood of improperly claiming the EITC, once the income test for the credit is accounted for. However, single individuals, elderly filers, and homeowners are all relatively less likely to claim a credit to which they are not entitled, while married separate and unemployed filers are relatively more likely to submit an improper claim. Residence in a state that administers its own earned income tax credit program has a small positive, but statistically insignificant impact on the likelihood that an ineligible household will claim the credit.

The estimated coefficient of our tax preparation assistance dummy is positive and significant, indicating that the use of tax practitioners actually led to a higher incidence of improper EITC claims in tax year 1988. The negative value of the estimated correlation coefficient  $\rho_{PCNE}$  indicates that the ineligible clients of tax practitioners had unobserved characteristics that made them relatively less prone to submit a claim for the EITC than ineligible filers who prepared their own returns. If this correlation term is restricted to zero, the constrained coefficient estimate for

our preparation assistance dummy becomes small and not significantly different from zero. Thus, even the constrained estimate suggests that practitioners played no deterrent role when it came to improper claims for the EITC.<sup>18</sup>

This finding is perhaps not so surprising. Prior to tax year 1997, tax practitioners had no legal obligation to verify that the information reported by their clients in support of an EITC claim was legitimate. Moreover, they had a financial incentive not to probe too deeply into the veracity of client claims. For instance, many tax practitioners earned (and continue to earn) additional money from EITC clients by facilitating "refund anticipation loans," whereby the client receives a loan (often at a very high effective rate of interest) in anticipation of and secured by the client's EITC or income tax refund. Since these loans were granted only after the practitioner received an electronic confirmation from the IRS that the credit had been approved, there was little financial risk associated with submitting EITC claims that might be somewhat questionable.

In response to concerns about improper EITC claims on returns prepared by tax practitioners, the Taxpayer Relief Act of 1997 introduced new due diligence requirements for tax preparers. Under these requirements, preparers are required to solicit certain information from taxpayers pertaining to their EITC eligibility and retain this information for a period of three years. The preparer is also required to make reasonable inquiries to resolve cases where any information furnished by a client or otherwise known to the preparer appears

incorrect, inconsistent, or incomplete. The preparer penalty for not complying with these requirements is \$100 per case.

The estimated correlation between the filing equation and claiming equation disturbances  $\rho_{FCNE}$  is positive and significant, indicating that unobserved factors that increase the odds of filing are associated with a higher incidence of improper credit claims.

In our analysis, we have made no attempt to assess the extent to which noncompliant behavior is deliberate. However, this issue has been explored by McCubbin (2000) and Liebman (1995, 1996), in terms of misreporting of children, and, with contrasting results, by Joulfaian and Rider (1996), in terms of misreporting of income. McCubbin and Liebman each find that the propensity to incorrectly claim a qualifying child for the EITC rises with the size of the credit, which they take as evidence that at least some share of incorrect child claims (at least 28 percent in the case of McCubbin; at least 32 percent in the case of Liebman) is deliberate.<sup>19</sup> In contrast, Joulfaian and Rider find that, with the exception of sole proprietors, there is no significant relationship between either the likelihood or magnitude of income misreporting and the size of the EITC (as reflected by the marginal tax rate), suggesting that income misreporting errors are generally unintentional.

The rate of noncompliance with the EITC appears to be high relative to the rates observed in more traditional U.S. welfare programs. For example, estimated overclaim rates for Aid to Families with Dependent Children (AFDC) and Food

<sup>18</sup> This finding is consistent with more recent evidence from an IRS study of EITC noncompliance in tax year 1994. As reported by the U.S. General Accounting Office (1998), EITC overclaim rates were found in that study to be approximately the same (26 percent) on self-prepared returns and those completed by preparers.

<sup>19</sup> While the responsiveness of child reporting errors to the size of the credit may very well be an indication of deliberate reporting errors, an alternative explanation would be that unintentional errors actually are more prevalent when the credit is large. For instance, the level of awareness may be higher when the credit is made more generous, and households with honest intentions may be more willing to tolerate the burden of filing and claiming the credit in this case. Depending on whether these potential new participants are relatively more prone to making errors than current participants, the higher error rate observed in the aforementioned studies could, at least in principle, be attributable to unintentional reporting errors.

Stamps have typically been around six to seven percent (U.S. Congress, 1998, Table 7–28, p. 466 and Table 15–7, p. 938). However, such a comparison is potentially misleading, owing to the differences in the underlying populations and estimation methodologies. For instance, the AFDC and Food Stamp populations include a substantial number of households with no earnings (elderly, disabled, or non-working welfare recipients).<sup>20</sup> If the error rate calculations for these programs were restricted to households with earnings, the estimates would be considerably higher. In addition, the Food Stamp error rate is calculated ignoring the first \$300 of a household's annual mistaken claims, whereas the computation of the EITC error rate includes all erroneous claims.<sup>21</sup> Even if these differences were accounted for, it is likely that the estimated overclaim rates for the EITC program would continue to exceed those for AFDC and Food Stamps; however, the difference would be less pronounced.

#### PARTICIPATION RATE

For households that are legally required to file a tax return, our data permit us to compute an EITC participation rate. As detailed in Table 1, our TCMP tabulation for filers indicates that 5.88 million out of 6.26 million eligible households claimed the credit in tax year 1988. Further, we estimate that 347,000 eligible households with a filing requirement failed to submit a return and, hence, made no application for the EITC. This implies a participation rate of  $5.88 / (6.26 + 0.347)$ , or 89 percent.

The TCMP data also permit us to estimate the number of eligible households

without a legal filing obligation that submitted returns. There were approximately 877,000 such households in tax year 1988, and about 864,000 of them claimed the EITC on their returns. Unfortunately, the TCMP data do not contain any information on the number of eligible households with no filing requirement that elected not to submit a return. However, our best available estimate, based on our analysis of the 1989 Current Population Survey, is that there were between 2.22 and 2.82 million eligible households in tax year 1988 with no filing requirement (including both filers and non-filers), depending on whether we impose a rough proxy for the support test for a qualifying child. This would imply a participation rate of only between 30.6 and 39.0 percent for households without a legal filing obligation—well below our estimate for households that are required to file. Presumably, in the absence of a legal obligation, such households are less prone to filing a return and, hence, claiming the credit. Awareness of the program may also be lower among such households.

The above finding places the comparison of traditional welfare programs with the EITC in new light. Traditional programs, such as Food Stamps and the former AFDC program, target a large share of all benefits to low-income households with no legal filing requirement. For instance, we estimate using the Current Population Survey (CPS) that only roughly 17.8 percent of AFDC households in tax year 1996 (the year before AFDC was replaced by Temporary Assistance for Needy Families (TANF)) were required to file a return, compared to approximately 75 percent for the EITC.<sup>22</sup> Among house-

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<sup>20</sup> For example, only an estimated 27 percent of all fiscal year 2001 Food Stamp recipients had any earnings (Rosso, 2003).

<sup>21</sup> This was pointed out by Robert Greenstein, Center on Budget and Policy Priorities, at the conference on *The Crisis in Tax Administration*, The Brookings Institution, Washington, DC, November 8, 2002. Liebman (2000, endnote 2, p. 1166) cites additional evidence for why the AFDC error rate may be understated.

<sup>22</sup> It is difficult to determine from the CPS what percentage of Food Stamp households were required to file a return; the percentage is likely to be higher than for AFDC, but still well below that for the EITC.

holds with no legal filing obligation, our above estimate of the EITC participation rate suggests that the EITC may actually be less effective than traditional welfare programs in reaching those in need. For instance, Blank and Ruggles (1993) estimate that participation rates may have been as high as 62 to 72 percent for AFDC and 54 to 66 percent for Food Stamps in the mid-1980s, depending on how the rates are computed. More recently, Cunnyngham (2002) estimates that the overall participation rate for the Food Stamp program was 59.3 percent for all individuals in all households in 2000 (53.2 percent for the households, themselves). However, the estimated participation rate was substantially higher among individuals with no earnings (67 percent) than for those with earnings (50.5 percent).

Combining our estimates for households with and without a legal filing obligation, our overall estimate of the EITC participation rate for tax year 1988 is between 69.4 percent and 74.3 percent, depending on whether we impose a rough proxy for the support test for a qualifying child in our CPS sample of households without a legal filing requirement. This is well below the estimates of Scholz (1994) and Liebman (1996) for tax year 1990 (Scholz: between 80.5 and 86.4 percent, depending on whether a proxy for the support test is imposed; Liebman: 81.2 percent). Given that the EITC program changed very little between tax years 1988 and 1990, we suspect that this discrepancy in results is largely a consequence of a difference in estimation methodologies rather than an actual improvement in program participation.

As a check on our approach, we used the CPS to develop an independent estimate of the number of eligible households with a legal filing obligation in tax year 1988. The CPS-based estimate (between 6.87 million and 6.89 million, depending on whether a proxy support test is imposed) is only slightly larger than our

TCMP-based estimate of 6.61 million. The consistency of these independent estimates gives us confidence in the accuracy of the denominator of our participation rate estimate. Moreover, there is relatively little scope for error in the numerator of our estimate, as this is based on verified administrative records concerning whether a family actually claimed the EITC on their tax return.

#### BEHAVIORAL RESPONSE TO RULE CHANGES

The EITC program has changed considerably since tax year 1988. To begin with, the average real value of the credit has more than doubled. In addition, the eligibility rules have been refined in an effort to target the credit more effectively towards needy families. A new means test based on the level of investment income became effective in tax year 1996 and was indexed to inflation. For tax year 1999, an otherwise eligible household with more than \$2,350 from investments was not entitled to the credit. Also in tax year 1996, a modified definition of AGI was introduced for computation of the credit that excluded certain losses from investments and businesses. However, the original AGI concept was reinstated in tax year 2002. Since tax year 1991, an eligible household with two or more qualifying children has been entitled to a larger benefit than a comparable household with one qualifying child. Also as of that year, taxpayers with a "single" filing status have been permitted to claim the credit.

As described in the Appendix, we have used our econometric results to simulate the effects of the rule changes between tax years 1988 and 1999 on EITC program participation among households with a legal filing requirement. The results are presented in Table 7. The number of eligible households with a qualifying child (and also a legal filing obligation)

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**TABLE 7**  
SIMULATION RESULTS: EITC PARTICIPATION AMONG  
ELIGIBLE HOUSEHOLDS WITH A FILING REQUIREMENT\*

	TY 1988 Rules TY 1988 Population	TY 1999 Rules TY 1988 Population	TY 1999 Rules TY 1999 Population
# Eligible Households	6,611	7,505	9,361
# Eligible Filers	6,264	7,200	9,063
# Claimants	5,881	6,978	8,819
# Non-claimants	383	222	244
# Eligible Nonfilers	347	305	298
Participation Rate	89.0%	93.0%	94.2%

\*Numbers are in thousands; eligible households with no qualifying children are excluded from the analysis.

increases from 6.61 million in tax year 1988 to 9.36 million in tax year 1999. We estimate that 9.06 million of the eligible households would file in 1999 year and that 8.82 million of them would actually claim the credit, for an implied participation rate of 94.2 percent, compared to 89 percent in tax year 1988. Much of the improvement in program participation is attributable to the impact of the substantially increased real value of the credit on a household's propensity to both file and claim the credit. According to our simulations, the average real value of the EITC (1988 dollars) increases from \$521 to \$1,293 for eligible households with one or more qualifying children under the tax year 1999 rules. A smaller portion of the improvement in EITC participation (1.2 percentage points) is attributable to changes in the size and composition of the population between tax years 1988 and 1999.

As a check on our simulation methodology, we have used data from an IRS study of EITC compliance for tax year 1999 to derive an independent estimate of the number of eligible claimants with a qualifying child who were required to file a return. Our estimate based on these

data is that there were 9.13 million such claimants in tax year 1999. This figure is only about 3.5 percent larger than our simulation estimate of 8.82 million, well within the margin of error.<sup>23</sup> The consistency between these two estimates suggests that our econometric model does a reasonably good job of capturing the impact of the various substantial program changes between tax years 1988 and 1999 on the propensity for eligible households to file and claim the EITC.

From the CPS, we estimate that there were approximately 3.27 million eligible households with at least one qualifying child in tax year 1999 that did not have a legal filing obligation. Based on the IRS study of EITC compliance for tax year 1999, it appears that 1.64 million of these households filed a return and claimed the credit, implying a participation rate of roughly 50 percent. This represents a substantial improvement in program take-up among households without a filing requirement relative to our tax year 1988 estimate of 31 to 39 percent. Nonetheless, their estimated participation rate is still fairly low and may very well be lower than participation rates within more traditional welfare programs.

<sup>23</sup> Although we have not calculated the precise margin of error associated with the difference between our two estimates, the margin of error ( $\alpha = .05$ ) associated with our 9.13 million point estimate, alone, exceeds this difference. The overall margin of error for the difference between estimates is considerably larger than this, because it must take into account the statistical imprecision associated with the point estimate from our simulation as well that associated with our point estimate based on the IRS study of EITC compliance for tax year 1999. We would expect our simulation estimate to understate the actual number of participants in tax year 1999 to some extent, because our model does not account for the EITC outreach activities of the IRS, state governments, and non-profit organizations during the 1990s.

## CONCLUSION

The U.S. Earned Income Tax Credit serves as an important case study for the delivery of social welfare benefits through the tax system. Advocates of the program tout the relatively high overall estimated participation rate and low administrative costs as evidence that the program is superior to more traditional welfare programs. Opponents, on the other hand, point to the relatively high rate of EITC noncompliance as evidence that the more intrusive elements of traditional welfare programs are required to prevent fraud and abuse. The results presented in this paper suggest that the arguments on both sides of the debate tend to be exaggerated. For instance, we find that the aggregate EITC participation rate masks important differences among households with and without a legal filing obligation. Among households that are not required to file—the group that has made up the predominant share of the caseload for more traditional welfare programs such as AFDC and Food Stamps—it appears that EITC participation may actually be inferior to participation in these other programs. Indeed, the high overall rate of participation and low administrative costs associated with the EITC would seem largely due to the fact that the program is much more heavily targeted towards households that already have to file a tax return. In this regard, the EITC might best be viewed as a complement to traditional welfare programs rather than as a potential replacement for them.

In terms of compliance, estimates from the EITC program do indeed show sharply higher rates of noncompliance than estimates from more traditional welfare programs. However, the difference in estimates partly reflects the differences in covered populations (especially the presence of many non-earners among the AFDC and Food Stamp populations) and estimation methodologies. If these differences were properly accounted for, esti-

mates of noncompliance within the EITC program would most likely remain higher than those for the other programs, but the difference would be less pronounced.

Beyond estimating the overall degree of EITC program participation, we have estimated behavioral equations describing the determinants of participation and compliance among households with a legal filing requirement. Our results indicate that households are more likely to comply with their filing obligations when they are eligible for the EITC. Further, we find that the likelihood of both filing a return and claiming the EITC is positively associated with the size of the credit. Eligible households with self-employment income are relatively less likely to file a return (and, hence, receive the credit), while those with prior filing experience or with income subject to information reporting are relatively more likely to file. Somewhat surprisingly, the use of tax preparation assistance does not appear to improve the likelihood that an eligible filer will claim the credit, once the role of sample selection is taken into account.

In addition to examining the characteristics of eligible participants, we have also explored the determinants of claims submitted by ineligible households. The results support our hypothesis that filers who satisfy some (but not all) of the EITC program requirements are relatively more likely to mistakenly infer they are eligible for the credit.

Many EITC participants employ a tax practitioner to assist them with claiming the credit. In response to a perception that tax practitioners were not doing enough to ensure compliance with the EITC, new regulations were introduced in 1997 that required them to undertake certain efforts to document their clients' eligibility. Our results for tax year 1988 support the perception that tax practitioners were not promoting compliance with the EITC. In particular, our results indicate that ineligible households that received tax

assistance were actually more likely to claim the EITC than ineligible households that prepared their own returns.

The average benefit under the EITC program has more than doubled in real terms since tax year 1988. Our simulations reveal that the degree of program participation among households with a filing requirement has improved in response to these more generous benefits, from 89 percent in 1988 to 94.2 percent in 1999. Based on a combination of survey and tax audit data, it appears that program participation may have improved even more dramatically over this period among households without a filing requirement. Our best estimate is that the take-up rate increased from somewhere in the range of 31 to 39 percent in tax year 1988 to approximately 50 percent in tax year 1999. However, it appears that the burden of filing a return continues to deter many households without a legal filing obligation from participating. A lack of program awareness may also be a factor.

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#### APPENDIX—SIMULATION METHODOLOGY

To simulate the impact of the substantial changes in EITC benefits and program rules between tax years 1988 and 1999 on the participation behavior of households with qualifying children (and also a legal filing obligation), we begin by identifying which members of our 1988 TCMP sample of households with a legal filing requirement would be eligible for the EITC under the tax year 1999 rules, adjusted to account for inflation. This involves converting the tax year 1999 income limitations and benefit amounts to real 1988 dollars (based on the consumer price index for urban consumers) and applying the relevant tax year 1999 means tests based on measures of earned income, modified AGI, and investment income we have constructed from the examiner-recorded values

for our TCMP sample of filers and non-filers. For tax year 1999, a qualifying child had to meet certain relationship, residency, and age requirements. Unfortunately, the TCMP data do not contain the necessary information to conduct an exact test of these conditions. As our proxy measure for the number of qualifying children, we employ the examiner-recorded value for the number of exemptions for children living at home, with one exception. Specifically, if the TCMP examiner concluded that a household with no dependent child exemptions was entitled to the EITC in tax year 1988, we assume that the household had one qualifying child. Based on the above tests, we select the subsample of all households with qualifying children that meet the (inflation-adjusted) tax year 1999 eligibility requirements for the EITC. The sum of the sample weights for this group represents our estimate of the number of tax year 1988 households with qualifying children that would be eligible for the credit under the tax year 1999 provisions and would be legally required to file a return.

Next, we age our subsample to make it broadly representative of the EITC-eligible population in tax year 1999 using a methodology previously developed by Erard (2001) for aging the TCMP data. This methodology involves adjusting the relevant sample weights and characteristics of our 1988 TCMP subsample to reflect the changes in comparable subsamples of CPS households between tax years 1988 and 1999.

The next step is to apply the econometric results from our behavioral model to simulate the number of eligible households that would file a return and claim the EITC under the tax year 1999 provisions. For each member of our aged TCMP subsample of eligible households (per tax year 1999 law) with a legal filing obligation, we estimate the probability of filing a return as:

$$[A1] \quad \Phi(\tilde{\beta}_F'X_F + \tilde{\alpha}A),$$

where  $\Phi(z)$  represents the standard normal c.d.f. evaluated at  $z$ . The terms  $\tilde{\beta}_F$  and  $\tilde{\alpha}$  repre-

sent the estimated values of the parameters of equation [1] in the main text, which have been presented in the Results section. The expression  $A$  represents the real 1999 value of the credit (in thousands of 1988 dollars). The weighted sum of the simulated filing probabilities over all households in our subsample represents our estimate of the number of eligible households with a qualifying child that would file under the tax year 1999 EITC rules. The joint probability that a household would file, employ tax preparation assistance, and claim the EITC is computed as:

$$[A2] \quad TN(\tilde{\beta}_F'X_F + \tilde{\alpha}A, \tilde{\beta}_P'X_P + \tilde{\gamma}, \tilde{\beta}_{CE}'X_{CE} + \tilde{\delta}_{CE'}\tilde{\rho}_{FP'}\tilde{\rho}_{FCE'}\tilde{\rho}_{PCE}),$$

where  $TN(z_1, z_2, z_3, \rho_{12}, \rho_{13}, \rho_{23})$  represents the value of the standard trivariate normal c.d.f. evaluated at  $z_1$ ,  $z_2$ , and  $z_3$  for correlations  $\rho_{12}$ ,  $\rho_{13}$ ,  $\rho_{23}$ . The terms with the tildes above them represent the estimated parameters from equations [1] through [3] in the main text. These parameter estimates have been presented in our Results section.

Similarly, the joint probability that a household would file, prepare its own return, and claim the EITC is computed as:

$$[A3] \quad TN(\tilde{\beta}_F'X_F + \tilde{\alpha}A, -\tilde{\beta}_P'X_P - \tilde{\gamma}, \tilde{\beta}_{CE}'X_{CE} - \tilde{\rho}_{FP'}\tilde{\rho}_{FCE'} - \tilde{\rho}_{PCE}).$$

The sum of the two probability expressions in equations [A2] and [A3] represents the joint probability of filing and claiming the EITC under the tax year 1999 provisions. The weighted sum of the simulated joint probabilities of filing and claiming the EITC over all households in our subsample represents our estimate of the number of eligible households with a qualifying child (and also a legal filing obligation) that would participate in the program under the tax year 1999 rules. The ratio of this figure to our estimate of the number of eligible households with a qualifying child yields our estimate of the participation rate.

