

EITC Noncompliance: the Misreporting of Children and the Size of the EITC

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Internal Revenue Service data indicate that \$4.4 billion in excess EITC was claimed for tax year 1994, largely due to violations of the qualifying child eligibility criteria. I find that the probability of misreporting a child is increasing in the size of the EITC and tax benefit. The estimated effect of the EITC on compliance is statistically significant, but modest in size. Reducing the size and scope of the EITC could improve compliance somewhat, but it would also reduce benefits to compliant taxpayers. Efforts to reduce the frequency of unintentional errors and enhance the effectiveness of enforcement activities might bring about greater improvements in EITC error rates, at a lower cost to compliant taxpayers.

The Earned Income Tax Credit was created in 1975, largely to offset the burden and labor force disincentives associated with Social Security taxes levied on low income workers.<sup>1</sup> In keeping with these goals, the credit was equal to 10 percent of earnings up to \$4,000. The credit was reduced by 10 cents for every dollar of income over \$4,000, and was therefore completely phased out when income reached \$8,000. The creators of the EITC also hoped that the credit would offset the work disincentives inherent in the welfare system. Because individuals with children are the most likely to be eligible for welfare benefits, the credit was limited to workers maintaining a household for a dependent child under the age of 19. The EITC has been modified since 1975, but the credit is still targeted to low income workers, particularly those with children.

As with all tax provisions (and all transfer programs), efforts to target EITC benefits to certain groups can exacerbate compliance problems and increase administrative costs. For example, very low income persons have an incentive to over-report income; those with moderately higher incomes face an incentive to under-report income. Persons with no children or only one child might benefit from over-reporting the number of children. In addition, some taxpayers might misunderstand the EITC eligibility criteria and make unintentional reporting errors.

To some extent, noncompliance is merely a transfer from the government to individuals, which has little effect on economic efficiency.<sup>2</sup> However, if there are noncompliant taxpayers, then tax rates must be raised or government expenditures must be reduced. Higher tax rates generally do result in efficiency losses, and reductions in government expenditures may prevent the achievement of other social goals. In addition, when noncompliance is advantageous, individuals might divert resources from productive activities to cheating activities. Furthermore, the tax authority must use resources to prevent, detect and punish cheating; and compliant filers must spend resources on documenting their compliance. This diversion of resources is likely to lead to losses in efficiency. On the other hand, to the extent that noncompliance reduces the effective marginal tax rate, it may mitigate distortions introduced by taxation and improve economic efficiency.

There are equity effects to consider as well. When noncompliance is undetected, noncompliant taxpayers are better off than compliant taxpayers with the same income and family characteristics, violating horizontal equity. In addition, to the extent that cheating reduces the targeting of the EITC, it might reduce the progressivity of the tax system and reduce the value of the EITC in the social welfare function.<sup>3</sup>

In designing the EITC, policy makers must consider these effects, just as they consider the effects of the credit on labor supply, poverty rates and so forth. Therefore in this paper, I examine the extent and nature of EITC noncompliance in 1994 (the most recent year for which compliance data are available). I find that the misreporting of EITC qualifying children is the most important EITC error, and was associated with an estimated \$3.1 billion in excess EITC claims. I then estimate the probability that a taxpayer erroneously claims an EITC qualifying child, as a function of the size of the EITC and other factors. I find that the probability of noncompliance is positively correlated with the size of the credit; and that reducing the EITC by 10 percent would reduce the amount of EITC overclaimed due to child misreporting by about 14 percent. However, scaling back the EITC would also reduce the amount of credit that could be claimed by compliant taxpayers, who comprise the majority of EITC recipients. Therefore reducing the EITC would reduce the EITC overclaim rate (defined as the amount claimed in

error divided by the total amount claimed) by only a negligible amount. Efforts to reduce the frequency of unintentional errors and enhance the effectiveness of Internal Revenue Service enforcement activities might bring about greater improvements in EITC error rates, at a lower cost to compliant taxpayers.

### **EITC Noncompliance in 1994**

The Internal Revenue Service has not conducted a comprehensive study of taxpayer compliance since 1988.<sup>4</sup> However, the IRS's Criminal Investigations Division (CID) has more recently examined the returns of 2,046 randomly selected taxpayers, who filed EITC claims for tax year 1994. The sample represents a population of 15.0 million returns and \$17.2 billion in EITC claims accepted by the IRS between mid-January and mid-April 1995. (During the entire filing year, 19.0 million tax return units claimed \$21.1 billion dollars in EITC.<sup>5</sup>)

It is important to note that the EITC errors identified in the study include both intentional noncompliance and unintentional reporting mistakes. However, returns were selected after computational and clerical errors were corrected, as part of routine IRS processing. Therefore simple mathematic errors are not counted as noncompliance in this study. In addition, it is important to keep in mind that the IRS audited EITC claimants only. Therefore the study data can be used to estimate the gross amount of EITC claimed in error and the total amount of EITC claimed, but they cannot be used to estimate the amount claimed in error net of the amount not claimed or the total amount of EITC that should have been claimed.

#### ***EITC error rates***<sup>6</sup>

The results of these examinations indicate that \$4.4 billion in excess EITC was claimed during the January to April study period. This accounted for 25.8 percent of the total EITC claimed for the same period. About 12.0 million taxpayers claimed the credit for workers with EITC qualifying children, during the study period. These taxpayers claimed an estimated \$4,368 million in excess EITC amounts, resulting in an overclaim rate of 26.1 percent for this group. About 3.0 million taxpayers claimed the smaller credit for workers without EITC qualifying children, during the study period. The CID data indicate that these taxpayers claimed \$81 million in excess EITC, resulting in an overclaim rate of 15.7 percent for this group.<sup>7</sup>

These estimated error rates are for amounts claimed rather than amounts paid, and do not reflect the effect of IRS enforcement activities. The IRS and the Treasury Department estimated that if IRS enforcement procedures in effect during the 1995 filing season were taken into account, the error rate would have been reduced from 25.8 percent to about 23.5 percent. The IRS and Treasury also estimated that if certain new enforcement procedures first in effect during the 1997 filing season had been in effect in 1995, the error rate would have been reduced further, to about 20.7 percent.

The IRS found that some filers who claimed the credit did not claim the full amount to which they were entitled. These taxpayers failed to claim an estimated \$293 million, or 1.7 percent of the total EITC claimed for the same period. However, this estimate excludes the amount that should have been

claimed by taxpayers who did not claim any EITC. Scholz (1994) estimates that for tax year 1990, 13.6 to 19.5 percent of eligible taxpayers failed to claim the EITC.

### ***Errors associated with the qualifying child criteria***

Taxpayers with one or more qualifying children receive a substantially larger credit. A qualifying child must be under age 19, a full-time student under age 24, or permanently and totally disabled. The child must be the filer's own child (including an adopted child or step-child), grandchild, or foster child. The child must have lived with the filer in the United States for more than half of the tax year if the child is the taxpayer's own child or grandchild; or for the entire tax year if the child is the taxpayer's foster child. If a child is the qualifying child of more than one person (because more than one person lived with and was related to the child), then only the taxpayer with the higher AGI may claim the credit. The taxpayer must provide a taxpayer identification number (typically a Social Security Number) for each child claimed. For tax year 1994, children under the age of one were exempt from the SSN requirement.<sup>8</sup>

The sources of EITC overclaims, among taxpayers with and without claims for EITC qualifying children, are summarized in Table 1. The largest source of EITC errors was the failure to meet the EITC qualifying child criteria. \$2,605 million in excess EITC claims (58.6 percent of the total amount overclaimed) occurred on returns on which an EITC qualifying child was claimed in error, and for which no other error was detected. Another \$475 million in excess EITC (10.7 percent of the total) was associated with erroneous child claims, on returns that also had income and/or filing status errors.

The failure to meet the residency test was the most important qualifying child error. An estimated \$1,470 million in EITC was erroneously claimed by taxpayers who did not live with the qualifying child claimed for the required length of time during the tax year, and who did not make any other detected qualifying child error. Another \$254 million in errors was associated with failure of the residency test and some other qualifying child criteria (most often the relationship test).

About \$782 million in EITC overclaims occurred on returns filed by taxpayers who failed the AGI tiebreaker test. In these cases, both the taxpayer and another person were eligible to claim the same qualifying child, but the taxpayer included in the sample had lower AGI, and should not have claimed the credit. An estimated 38.0 percent of the overclaimed amount occurred in cases where the taxpayer's parent had the higher AGI and was eligible to claim the credit. It appears that another 46.8 percent of the overclaimed amount occurred in cases where the taxpayer's boyfriend or girlfriend had the higher AGI and was deemed eligible to claim the credit. In the remaining cases, the taxpayer with the higher AGI was another friend or relative of the sampled taxpayer, or was a person whose relationship to the taxpayer could not be determined.

The IRS did not collect additional information on the taxpayer with the higher AGI. Hence it is impossible to determine whether the filer with the higher AGI claimed the credit or was eligible to claim credit. (A taxpayer with higher AGI but with no earned income or with AGI or earnings over the EITC threshold would not be allowed to claim the credit. In that case, no EITC for either taxpayer is allowed.) Because some taxpayers with higher AGI could have claimed the credit but did not, and because the IRS study did not account for EITC nonparticipation, the importance of violations of the AGI tiebreaker rule is probably overstated by these data.

Furthermore, in a number of cases (accounting for 24.9 percent of the total amount of EITC error attributable to the AGI tiebreaker), it appears that the other adult in the home was the taxpayer's boyfriend or girlfriend and was not the parent of the child. The IRS did not record the relationship of the taxpayer to the qualifying child on the corrected return, when the EITC claim was disallowed. However, it is likely that many of the taxpayers who were denied the credit due to the AGI tiebreaker were the parents of the child. Hence, in some cases, IRS agents denied the credit claimed by a parent, in favor of a foster parent who was not related to the child biologically or by marriage. It is not at all clear that policy makers intended for parents to be ineligible for the credit in these cases. Largely in response to this finding, the Treasury Department proposed to modify the definition of a foster child. Under current and 1994 law, a foster child may be any child whom the taxpayer lives with for the entire year and cares for as the taxpayer's own child. Under the proposed definition, the taxpayer must still reside with and care for the foster child as the taxpayer's own child. In addition, the foster child must be the taxpayer's sibling; a descendant of the taxpayer's sibling; or a child placed in the taxpayer's care by a court, government agency, or licensed tax-exempt child placement agency. Unrelated persons could not claim a qualifying child whom they cared for under less formal arrangements.

An estimated \$559 million in EITC overclaims occurred on returns in which the child failed the relationship test, and about \$202 million in errors were associated with the failure of the age test. About \$63 million in errors occurred in cases in which the claimed child did not appear to exist at all. I could not determine the nature of the qualifying child error in some cases (due to missing or inconsistent data); these cases accounted for about \$73 million in EITC overclaims.

### ***Errors associated with filing status***

Another important source of error is the misreporting of filing status by married taxpayers. Taxpayers who use the married filing separately status may not claim the EITC. In addition, taxpayers who are married and filing jointly may receive a smaller credit than they would receive filing as unmarried persons. Suppose for example that taxpayers A and B are married and have three children, that taxpayer A has earnings of \$20,000, and taxpayer B has earnings of \$10,000. This couple is not eligible for any EITC in 1994, because their combined earned income exceeds \$25,296. However, taxpayer A would be eligible for a credit of \$596 based on one qualifying child, or \$932 based on two children; taxpayer B would be eligible for a credit of \$2,038 based on one qualifying child or \$2,528 based on two children. Therefore if taxpayers A and B misreport their filing status (and file as single persons or heads of household), then they can claim as much as \$3,124 in combined earned income tax credit, even if they do not duplicate their qualifying child claims.<sup>9</sup>

The misreporting of filing status was associated with an estimated \$1,394 million in EITC overclaims, or 31.3 percent of the total amount overclaimed during the study period. (Some returns with filing status errors also had income or qualifying child errors which contributed to the EITC reduction or denial.) About three-fourths of these errors occurred on returns for which the IRS changed the filing status of the sampled taxpayer from single or head of household to married filing separate, resulting in a complete denial of the credit. In the remaining cases, the IRS changed the filing status to married filing jointly, and the addition of the spouse's income to the sampled return resulted in a reduction or the denial of the

credit. The IRS did not record any additional information about the spouse who was not sampled, and it is not known whether or not the other spouse also claimed the EITC.<sup>10</sup>

### ***Income reporting errors***

The EITC is initially increasing in earned income, then constant as income rises, and finally decreasing with income until it is completely phased out. The phase-in rate applicable for tax year 1994 was 7.65 percent on earnings up to \$4,000 for filers with no qualifying children; 26.3 percent on earnings up to \$7,750 for filers with one child; and 30 percent on earnings up to \$8,425. Hence the maximum credit ranged from \$306 to \$2,528, depending on the number of qualifying children. The credit for taxpayers without children was phased out once earnings or AGI reach \$5,000, at a rate of 7.65 percent; and was completely phased out once income reached \$9,000. The credit for filers with one child was phased out at a rate of 15.98 percent applied to income over \$11,000, and was completely phased out at income of \$23,755. The credit for filers with two or more children was phased out at a rate of 17.68 percent of income over \$11,000; and was entirely phased out once income reached \$25,296.<sup>11</sup>

Income under-reporting (excluding amounts added to the sampled taxpayer's return but initially reported by a spouse who filed separately) was associated with about \$432 million, or 9.7 percent, of the excess EITC claimed. Wages account for the largest amount of unreported income (\$1.5 billion), followed by self-employment earnings (\$1.3 billion) and unemployment compensation (\$476 million).

Because a taxpayer must have earned income in order to receive the EITC, and because for very low income workers the EITC is increasing in earned income, some taxpayers may be induced to over-report income. This possibility has concerned a number of policy makers and researchers, particularly as the EITC phase-in rate has increased to exceed the self-employment tax rate of 15.3 percent.<sup>12</sup> However, income over-reporting was rarely observed in the tax year 1994 data. It was associated with only about 1 percent of the EITC overclaim.<sup>13</sup>

Income over-reporting might account for a small percentage of EITC overclaims for several reasons. It is possible that taxpayers in the phase-out range find it relatively easy to increase the EITC amount by failing to attach one Form W-2, while taxpayers with earnings in the phase-in range find it more difficult to increase the EITC amount by fabricating a Form W-2 or self-employment income. In addition, a taxpayer is probably more likely to unintentionally omit earnings than to unintentionally over-report earnings. Third, while the EITC increases with earnings for recipients in the phase-in range, AFDC and Food Stamp benefits decrease with earnings. Low income EITC recipients might not want to over-report income, for fear of jeopardizing eligibility for other benefits.<sup>14</sup>

### ***Complexity, refundability, and other issues***

Some tax professionals have suggested that complexity in the definition of a qualifying child, and in particular, differences in the definitions of dependent children and EITC qualifying children contributes to errors.<sup>15</sup> The definitions of dependent children and EITC qualifying children have never been identical, and they were made less similar in 1990, primarily in an effort to simplify the administration of the EITC. However at least 16.4 million (or 93.9 percent) of the EITC qualifying children claimed during the study period were also claimed as dependents.<sup>16</sup> In 13.1 million of the matched cases, both the EITC claim

and the dependent exemption were allowed. In 1.7 million cases, both the EITC qualifying child and the dependent claim were denied. In about 1.0 million cases, only the EITC claim was denied; and in about 0.7 million cases, only the dependent exemption claim was denied. When both the EITC claim and the dependent exemption were denied, the failure of the residency test was the most common reason for the denial of the EITC claim (accounting for 1.1 million cases); IRS did not record the reason for denying the dependent exemption. When only the EITC was denied, the most common reason for denying the EITC child was the failure of the AGI tiebreaker (about 0.4 million cases).

Given that different determinations were made about the EITC child and dependent claims in 1.6 million cases, it is possible that confusion about the different definitions is contributing to EITC and dependent exemption errors. On the other hand, the fact that both the EITC child and the dependent claim were denied in 1.7 million cases highlights that many of the errors which cause EITC overclaims also result in mistakes on other parts of the tax return. The misreporting of income, marital status and information about children affects the tax return filer's entire tax liability, and not only the EITC. From the CID data on EITC claimants alone, it is very difficult to determine how important EITC noncompliance is relative to noncompliance with respect to other parts of the tax code. In addition, it is difficult to determine the extent to which reporting errors are made in response to incentives created by the EITC, and the extent to which they are attributable to other incentives.

More generally, it is virtually impossible to distinguish taxpayer confusion from intentional misreporting, using the CID data. The IRS did ask agents to indicate whether they thought that each EITC overclaim was intentional or unintentional, and using this information, IRS officials have testified that about 50 percent of overclaims were attributable to unintentional mistakes.<sup>17</sup> However, the terms intentional and unintentional do not correspond directly to the types of errors defined in the tax code, and IRS agents were given no specific criteria on which to base a determination of intent.

Perhaps as a consequence of the lack of specific instructions about taxpayer intent, it is possible to identify cases that appear to involve similar circumstances, but which are coded differently. (It should be noted however, that only part of the information available to IRS agents was transcribed and made available for analysis; hence unobserved differences in the cases could explain variation in determinations of intent.) In addition, some IRS examiners were much more likely than others to code errors as intentional; and these differences remain statistically significant, even after controlling for the size and type of error. Furthermore, errors made by men filing as single or as head of household were more likely to be coded as intentional than similar errors made by unmarried women and by married taxpayers. It is not clear why men would tend to make intentional mistakes, whereas women and couples filing jointly would be more likely to make unintentional errors. It is possible that the determinations about taxpayer intent reflect primarily the IRS agent's certainty about the presence of an EITC error, rather than the nature of the taxpayer's behavior.

Schiffren (1995) and others have suggested that the refundable nature of the EITC (that is, the fact that the full EITC is paid to the taxpayer, including any portion in excess of income tax or self-employment tax liabilities) invites noncompliance. The CID data for 1994 do not appear to support this theory. The EITC overclaim rate among taxpayers with no income tax or self-employment tax liability, and who therefore would have received the entire EITC in the form of a refund, was 12.7 percent. The overclaim rate among taxpayers with some income or self-employment tax liability, and who therefore

would receive less than the entire EITC as a refund, was 37.7 percent. Hence filers seem to be more likely to claim the EITC in order to avoid a tax liability than to claim the EITC to generate a refund. It is also possible that filers who are not eligible for the EITC are also not eligible to claim dependent exemptions, the head of household filing status, or other items that reduce taxable income and taxes, and are therefore more likely to have a tax liability.

During the study period, 31.2 percent of EITC claims were filed electronically, and 68.8 percent were filed on paper returns. Some have worried that electronic filing will invite noncompliance, because the IRS has committed to processing electronic returns more quickly, and might therefore have less time to check for errors.<sup>18</sup> Others have hypothesized that the speed of the refund--the lure of quick money--makes cheating via electronic filing more attractive. In fact, electronic returns were subject to tighter scrutiny in 1994 than were paper returns; and the CID data show almost no difference in the EITC overclaim rate for paper returns (26.1 percent) and that for electronic returns (25.3 percent). Perhaps the attraction of filing electronically and receiving the refund quickly is outweighed by the additional scrutiny applied to electronic returns in 1994.

Some financial institutions offer refund anticipation loans,<sup>19</sup> whereby taxpayers use their expected tax refund as collateral for a short term loan. The IRS data indicate that 47.9 percent of electronic filers applied for a refund anticipation loan. IRS data do not indicate which filers actually received a loan. Some tax administrators have suggested that refund anticipation loans encourage noncompliance, because they make it easier for filers to take the money and run.<sup>20</sup> The tendency to use a refund anticipation loan may also be correlated with noncompliance (but not actually cause noncompliance) if filers with a high rate of time preference are simultaneously more likely to overclaim the EITC and more likely to use refund anticipation loans. In fact, the gross overclaim rate among filers who applied for loans (26.6 percent) is not markedly higher than the rate among filers who did not (about 24.0 percent). This may be because faster refunds do not encourage noncompliance and are not associated with noncompliance; or because lenders screen out some suspicious claims before they are filed.

In addition, the CID data show virtually no difference in the error rates of taxpayers who used paid preparers and those who prepared their own returns. An estimated 44.2 percent of EITC claimants filed their own returns; the error rate among these returns was 26.1 percent. About 54.2 percent of the taxpayers represented by the study used paid preparers, and the EITC overclaim rate among these returns was 25.7 percent.<sup>19</sup> However, a deeper analysis shows substantial differences in error rates across different types of preparers. About 8.9 percent of EITC claims during the study period were prepared by attorneys, certified public accountants or enrolled agents. The EITC overclaim rate among these returns was 14.8 percent. Another 15.6 percent of EITC claims were prepared by large, nationally recognized tax preparation services. The error rate among these returns was 23.1 percent. About 29.7 percent of EITC claims were completed by other types of paid preparers. These other types of preparers include persons who are not attorneys, certified public accountants or enrolled agents; and persons who are self-employed or working for smaller, local firms. The other categories also includes cases in which the type of preparer could not be determined. The error rate among these EITC claims was 30.6 percent.

There do not appear to be substantial differences in the types of errors made by different kinds of preparers. Rather, some types of preparers appear to be better than others at comprehending and

applying all of the EITC eligibility criteria to their clients' situations. In a number of cases, the IRS agents reported that the tax return preparers had not asked the taxpayers for all of the information needed to determine their EITC eligibility. It is also possible that differences in the overclaim rates reflect different characteristics of the clients who choose different kinds of preparers.<sup>20</sup>

### **Modeling the Determinants of Qualifying Child Misreporting**

Findings from the 1985 and 1988 Taxpayer Compliance Measurement Program (TCMP) studies influenced decisions to modify the EITC eligibility criteria in 1990 and subsequent years.<sup>21</sup> Noncompliance rates estimated from TCMP data and these new estimates for tax year 1994 continue to influence policy debates about the appropriate size and structure of the EITC. For example in 1995, the U.S. Senate proposed reductions in the EITC in order to prevent the abuse of the credit. However, it is not immediately clear how taxpayer noncompliance is expected to change with the size and structure of the EITC. Therefore in this section, I estimate the probability that an ineligible taxpayer claims an EITC qualifying child, given the resulting EITC and tax benefits and other variables.<sup>22</sup>

#### ***Creating a Data Set of Ineligible Claimants and Nonclaimants***

Data for ineligible EITC claimants alone tell us little about the determinants of EITC noncompliance. Rather, a sample containing both taxpayers that are not eligible for the EITC and do not claim the credit and taxpayers who are not eligible for the EITC but do claim it--that is, a sample of both compliant and noncompliant taxpayers--is needed to estimate the determinants of EITC noncompliance. The EITC compliance study does not include data on taxpayers who do not claim the EITC, and the IRS has not conducted a study of compliance among the larger population of all individual income tax return filers since 1988. The IRS's Statistics of Income Division (SOI) does collect tax return data for a large stratified sample of returns in every year. These returns are unaudited; however, I can identify taxpayers who do not claim the EITC, even though they report income and other characteristics that would make them eligible for the credit, if they had an EITC qualifying child.<sup>23</sup> These observations can be combined with the observations from the CID study, to construct a sample of compliant and noncompliant taxpayers without qualifying children, with which to examine the determinants of erroneous EITC claims.

The sample of audited EITC claimants includes 534 taxpayers who erroneously claimed an EITC qualifying child, and who reported income and other characteristics such that they appeared eligible for the credit given one qualifying child. These 534 ineligible claimants represent 2.2 million tax year 1994 returns, with total EITC claims of \$3.1 billion, and excess claims of \$3.0 billion. To identify their compliant counterparts in the SOI data, I eliminate taxpayers that claim EITC qualifying children. I also eliminate taxpayers who, based on their reported income and other characteristics, would not be eligible for the EITC even if they had a qualifying child; returns filed for years other than 1994; and returns filed before mid-January or after mid-April. The result is a sample of 7,596 observations, representing 24,807,000 tax returns.

Table 2 shows the unweighted and weighted number of observations in the combined sample, by gender and reported filing status. On average, each of the 534 observations in the noncompliant portion of the sample represents 4,064 returns, whereas each of the 7,596 observations in the compliant portion

of the sample represents 3,266 returns. If I modeled EITC noncompliance using unweighted observations, my estimates would be biased, because compliant filers are sampled at a higher rate, and therefore are over-represented, relative to noncompliant filers. In addition, the CID sample is over-representative of male taxpayers and the SOI sample is over-representative of married taxpayers and of taxpayers with certain types of income. Therefore I used weighted observations for the remaining analysis. The combined weighted sample indicates that for tax year 1994, there were 27.0 million low-income filers who were ineligible for the EITC because they did not have an EITC qualifying child, and that 2.2 million (or 8.0 percent) of these ineligible filers erroneously claimed the EITC.

It might seem problematic to combine observations from two different data sets in this way. If the observations from the two data sets differed in some way that was correlated with the benefit of claiming a child, then the estimated effect of the EITC on compliance would be biased. However, the key information source for both sets of observations is the tax return as it was filed by the taxpayer. Both data sets employ stratified random samples with known selection criteria, and nearly all of the variables in the econometric model are defined identically for observations in the two data sets. (Exceptions are discussed below.) Estimates about the population of EITC claimants made from the two data sets are quite similar. Therefore I am confident that the combined data set adequately represents the population of low-income workers who do not have EITC qualifying children.<sup>24</sup>

### *A theoretical model of noncompliance*

Now consider the choice of whether or not to report a child, for a fully informed taxpayer who does not have a child. The benefits of noncompliance are a function of the resulting tax understated and EITC overstated. If the costs of noncompliance are also functions of only the tax understatement and EITC overstatement (and not directly affected by the taxpayer reported values of income and children), then the marginal benefit and marginal cost of noncompliance change proportionately each time that the EITC or tax functions are changed. As a result, changes in the EITC or tax functions generate no substitution effect, and cannot induce noncompliance among taxpayers that are compliant in the initial state.<sup>25</sup> However, if the costs of noncompliance are direct functions of reported income and reported children (in addition to or instead of being functions of the tax understated and EITC overstated), then the changes in the marginal benefit and marginal cost of noncompliance are not proportional. In this case, it is possible that increases in the return to children and in the EITC phase-out rate can induce noncompliance among previously compliant taxpayers.

For example, suppose that the penalty for noncompliance is directly a function of the reported number of children and reported income as well as a function of the resulting tax and EITC misreported.

$$\begin{aligned} & \text{Max}_{y_r, x_r} [1 - p]U(y_t - \tau[y_r - \mathbf{d}_r] + E(y_r, x_r)) \\ & + pU(y_t - \tau[y_r - \mathbf{d}_r x_r] + E(y_r, x_r)) - p(y_t - y_r, x_r - x_t, T, \mathbf{g}) \\ & \text{subject to: } 0 \leq x_r \leq 2, \end{aligned}$$

In particular, let me specify the taxpayer's utility maximization problem as:

where the variable  $y_r$  is reported income,  $x_r$  is the reported number of children,  $y_t$  and  $x_t$  are the true values of income and the number of children,  $p$  is the probability of detection,  $\tau$  is the income tax rate,  $\delta$

is the amount of income exempt from tax for each reported child,  $E(y_t, x_t)$  is the EITC as a function of reported income and the reported number of children,  $\pi$  is the penalty for noncompliance,  $T$  is the tax under-reported plus the EITC over-reported (that is,  $T = \tau[y_t - \delta x_t - y_r + \delta x_r] + E(y_t, x_t) - E(y_r, x_r)$ ), and  $\gamma$  is a vector of demographic characteristics.<sup>26</sup>

In this example, the specification of the penalty function is crucial to the theoretical predictions of the model. There are, essentially, five possible outcomes when an individual tax return filer is found to have understated his or her Federal tax liability: no penalty, a 20 percent civil penalty, a 75 percent civil penalty, criminal sanctions, or a combination of criminal and civil penalties. A taxpayer is subject to the 20 percent penalty if the tax understatement exceeds the greater of 10 percent of the required tax or \$5,000; or, if the understatement is due to negligence or disregard of rules or regulations.<sup>27</sup> The taxpayer is subject to the 75 percent penalty if the understatement is attributable to fraud.<sup>27</sup> Potential criminal sanctions include fines of up to \$100,000 and imprisonment of up to three years for statements on a tax return that the taxpayer does not believe to be true and correct as to every material matter,<sup>28</sup> and fines of up to \$100,000 and imprisonment of up to five years for willfully attempting to evade or defeat any tax.<sup>28</sup> Hence a fraudulent tax return statement could yield a civil sanction of 75 percent of the tax understatement plus an additional criminal penalty of \$100,000 and three years in prison. In contrast, a taxpayer who has not made a substantial understatement, and who has not made an understatement attributable to negligence, disregard or fraud, will be liable only for the understated tax and interest.<sup>29</sup>

Given this penalty structure, the taxpayer's diligence and intent (and the tax authority's determination about the taxpayer's diligence and intent), as well as the tax understatement and EITC overstatement, determine the marginal penalty that is assessed. It is possible that the nature and size of the reporting error (regardless of the effect on the net tax understatement) will enter into the tax authority's determination. For example, a filer who understates interest income by \$10 might reasonably assert that he or she forgot about that interest (or about the savings account that generated it). However, a filer who understates interest income by \$1,000 can less plausibly make that assertion.

Therefore I specify the penalty ( $\pi$ ) as a function of the variables  $y_t - y_r$  and  $x_r - x_t$  to reflect the possibility that the tax authority's determination about the filer's diligence and intent is influenced by the size of the reporting error, regardless of the size of the net tax understatement,  $T$ . In addition, the terms  $y_t - y_r$  and  $x_r - x_t$  distinguish income reporting errors from child reporting errors and thereby allow for the possibility that the tax authority's determination about the filer's diligence and intent is influenced by the type of error, regardless of the impact on  $T$ .

$$[1 - p]U_r \left[ \mathbf{td} + \frac{\partial E(y_r, x_r)}{\partial x_r} \right] + pU_{2r} \left[ \mathbf{td} + \frac{\partial E(y_r, x_r)}{\partial x_r} \right] \left[ 1 - \frac{\partial p}{\partial T} \right] - pU_{2r} \frac{\partial p}{\partial x_r} = 0,$$

In this model, the first order condition describing the optimal number of children reported is: where the first term is the expected marginal benefit of misreporting a child (weighted by marginal utility in the unaudited state, denoted 1), and the second and third terms comprise the expected marginal cost of misreporting a child (weighted by marginal utility in the audited state, denoted 2). The optimal number of reported children will be positive if the first order condition is positive when evaluated at

reported income equal to  $y_r$  and reported number of children equal to zero.<sup>30</sup> Therefore I estimate the probability that an ineligible taxpayer reports an EITC qualifying child given the benefit of reporting a child evaluated at the point  $(y_r, x_r=0)$ . Because the taxpayer chooses reported income as well as the reported number of qualifying children, the EITC and other variables conditioned on reported income may be endogenous. The model estimated here assumes that all of the explanatory variables are exogenous. The results are not markedly different when a simultaneous equations model that accounts for the possible endogeneity of income is estimated.

### ***Tax variables***

The key explanatory variable is  $ME(y_r, x_r)/Mx_r$ --the increase in the EITC that the filer can receive by reporting one child, conditional on reported income. Based on the theoretical model outlined above, I expect the incidence of noncompliance to be increasing in the size of the EITC benefit. The average increase in EITC obtainable by reporting one EITC qualifying child among taxpayers who do not report a child is \$1,101; the average EITC benefit of claiming one child among taxpayers who do report at least one child is \$1,290.

Taxpayers who report a qualifying child might reduce their income tax liability before credit, in addition to obtaining the EITC. For example, while (except for married filing separately taxpayers) the reported filing status has no direct bearing on the EITC, there are some common aspects of the EITC eligibility criteria and the head of household filing status definition. To receive the EITC, a taxpayer must have resided with an EITC qualifying child for over half the year. To qualify for head of household status, a taxpayer generally must have paid the cost of maintaining a home that was the home of their unmarried child or of their dependent for over half the year. Therefore a taxpayer that reports that he or she resides with a child may benefit from obtaining the head of household filing status, as well as from obtaining the EITC. In addition, while the reported number of dependents has no direct effect on the EITC, there are some common aspects of the dependent and EITC child definitions. As a result, a taxpayer who reports that he or she has a child may benefit by obtaining a dependent exemption, as well as from obtaining the EITC.

In fact, nearly all of the taxpayers who erroneously claimed a qualifying child also claimed one or more dependent exemptions; and 83 percent of taxpayers who erroneously claimed a qualifying child also claimed the head of household filing status. Only 5 percent of taxpayers who did not claim a qualifying child claimed a dependent; and 4 percent of taxpayers who did not claim a qualifying child claimed the head of household filing status. Given their reported incomes, compliant taxpayers (those who did not claim an EITC qualifying child) could expect an average benefit of \$288, from misreporting a dependent and filing status; noncompliant filers would receive an average benefit of \$276 from misreporting a dependent and filing status. This tax benefit variable corresponds to the term  $\tau\delta$ , in the theoretical model.<sup>31</sup>

In the preferred specification of the model, I impose the assumption that a dollar of EITC benefits will have the same effect on compliance as a dollar of other tax benefits obtainable by reporting a child. The average of EITC and other tax benefits from claiming a qualifying child among taxpayers that did not claim an EITC qualifying child is \$1,389; the average benefit among taxpayers that did claim a child is \$1,566. (See Table 3.)

I also expect opportunities for child misreporting to be an important determinant of taxpayer noncompliance. In models of income reporting, measures of noncompliance opportunities typically include whether or not the taxpayer is self-employed or the fraction of income subject to withholding at the source. Indications of child misreporting opportunities might include whether or not a taxpayer resides with a child at any time during the year, whether the taxpayer is a noncustodial parent, and whether a taxpayer has access to a child's SSN and other information about a child with which to support an EITC claim. This information is not available in the tax return data. However, I do observe whether or not taxpayers claimed a dependent or the head of household filing status; and, for EITC claimants, I observe whether the dependent and filing status claims were denied or allowed. I include a dummy variable equal to one for taxpayers with a dependent or the head of household filing status, as reported if the taxpayer did not claim the EITC and as determined by the audit if the taxpayer did claim the EITC, as an indication of greater opportunity for misreporting an EITC qualifying child.<sup>32</sup>

There are several other reasons why taxpayers that are eligible to claim a dependent or the head of household filing status might be more likely to erroneously claim the EITC. Some taxpayers who have a dependent or who are heads of household might choose to claim the EITC because they feel entitled to it (having provided support for a dependent or maintained a household for a child). Taxpayers who have a dependent child might also be more aware of the EITC (and of the size of the benefit of claiming the EITC). In addition, taxpayers might not understand the differences in the definitions of EITC qualifying children and dependent children or children that qualify the taxpayer for the head of household filing status. Once a taxpayer has determined (near the beginning of filling out the tax form) that he or she is eligible to claim a dependent or the head of household filing status, the taxpayer might assume that he or she is also eligible for the EITC (which is reported near the end of the tax form), without carefully evaluating the EITC eligibility criteria. In addition, noncustodial parents who are allowed to claim a dependent exemption as part of a separation agreement or divorce decree might fail to understand that these agreements do not apply to EITC qualifying children. As a result, taxpayers with dependent children might be making unintentional EITC errors.<sup>33</sup> Six percent of taxpayers who did not claim an EITC qualifying child did claim a dependent or the head of household filing status; 36 percent of taxpayers who did erroneously claim an EITC qualifying child were allowed a dependent or the head of household filing status.

Most states and the District of Columbia also tax individual incomes. Because some information is shared by states and by the IRS, and because some states require taxpayers to refer to items on their Federal returns in completing their state returns, there is likely to be a correlation between misreporting on Federal returns and misreporting on state returns, and thereby a correlation between misreporting on Federal returns and state tax rates. Therefore I include a dummy variable equal to one for filers living in states with income taxes.<sup>34</sup> Eighty-one percent of the filers who did not claim an EITC qualifying child and 79 percent of filers who did claim a child filed from a state with an income tax.

Similarly, several states have an earned income tax credit, usually equal to a fixed percentage of the Federal credit; and I include an estimate of the value of the state EITC as an explanatory variable.<sup>35</sup> In order to avoid introducing another potentially endogenous variable, I use the maximum value of the state EITC given one child. Nearly 15 percent of filers who did not claim an EITC qualifying child lived in a state with an EITC, and could have received an average state credit of up to \$281. Twelve percent of

taxpayers who did claim a child lived in a state with an EITC; the average maximum state credit among these filers was \$418. (Unconditional means are shown in Table 3.)

### *Income and wealth variables*

The theoretical model also suggests that the incidence of noncompliance will depend on the taxpayer's true after tax income. Prior empirical research as well as the examination of EITC errors suggest that the taxpayer's withholding position might also be an important determinant of taxpayer compliance.<sup>36</sup> Therefore I divide the taxpayer's income into two parts: the income received by the taxpayer during the course of the year and the income received from or remitted to the IRS at the end of the year.

The effect of an increase in true before tax income ( $y_t$ ) on the optimal number of reported children depends on how income is changed in the audited state relative to how it is changed in the unaudited state, and also on the relative magnitudes of risk aversion in the audited and unaudited states. An increase in true income increases income in the unaudited state dollar for dollar. An increase in true income (holding the reported values of children and income constant) also changes the size of any tax understatement and EITC overstatement. Therefore a dollar increase in true income changes income in the audited state by \$1 less the resulting change in the penalty for noncompliance. Because I do not include any penalty variables in the model, the effect of variation in  $y_t$  will reflect both the direct effect of a \$1 increase in income and any effect operating through the expected penalty.

An increase in true income,  $y_t$ , changes income in the audited state by  $1 - [M\pi/MT][\tau - ME_t/My_t] - M\pi/My_t$ . The sign of the income effect depends on the sign of  $R_{A2}[1 - [M\pi/M][\tau - ME_t/My_t] - R_{A1}]$ , where  $R_A$  is the Arrow-Pratt measure of absolute risk aversion,  $-U''/U'$  (and where subscript 1 denotes the unaudited state and subscript 2 denotes the audited state). This is ambiguous in sign, even under the assumption of decreasing absolute risk aversion. If the marginal penalty, income tax rate and EITC phase-out rate are small (including cases where the taxpayer is in the EITC phase-in range such that  $ME_t/My_t > 0$ ), and if absolute risk aversion is decreasing in income such that  $R_{A2} > R_{A1}$ , then the income effect of an increase in  $y_t$  on the optimal number of reported children may be positive (increasing the optimal number of reported children and increasing noncompliance).

Secondly, if the *marginal* penalty is not constant, but is instead increasing in any tax understatement and EITC overstatement (or if it is increasing directly in  $y_t$ ), then an increase in income also generates a substitution effect which acts to reduce the optimal number of reported children and improve compliance if the taxpayer faces a positive tax rate. The marginal penalty effect works to increase the optimal number of children and diminish compliance if the taxpayer faces a negative tax rate. Therefore the total effect of an increase in true income on child misreporting is ambiguous in sign; it is most likely to be positive for taxpayers in the EITC phase-in range.

Recall that the returns obtained from the SOI sample are not audited, and true income is unobserved for these observations. Reported income is observed; but, because some filers will understate (or, more rarely, overstate) income on their tax returns, reported income might differ from true income and therefore reported income might be poorly correlated with the filer's degree of risk aversion. In addition, if the income reporting and qualifying child reporting decisions are correlated, then reported income will be endogenous in the model of qualifying child reporting. Therefore I use income as

reported to the IRS by employers, financial institutions, and other independent sources, on Form W-2, the 1099 forms and other information returns, as the measure of income for all filers.<sup>37</sup>

Income as reported on information returns may differ from the taxpayer's true income for several reasons. First, some types of income, such as most forms of business and farm income, are not independently reported to the IRS. Second, some types of income may be reduced by losses or expenses that are not independently reported to the IRS. To account for some of the differences between true income and income as reported on information returns, I further divide the measure of income received during the year ( $y_{i-w}$ ) into two variables.

The first variable includes forms of income that are virtually always independently reported to the IRS and are not typically offset by losses or other adjustments. This variable includes wages, interest, dividends, unemployment compensation, retirement account and pension distributions, social security benefits and tax refunds. Because this variable is intended to reflect all of the taxpayer's income (that enters into the utility function and determines the taxpayer's degree of risk aversion), I include the full value of retirement distributions and social security benefits, even if these amounts are not fully taxable. In addition, I include nontaxed employer provided dependent care benefits and deferred employee compensation. Finally, I subtract the amount of taxes withheld from income during the year, as reported for the taxpayer by the withholder. Compliant filers have average income in this form of \$9,998; noncompliant filers have average income of this form of \$9,072.

The second component of income received during the year includes forms of income against which losses or expenses (the true values of which are not observed) might be deducted. This variable includes nonemployee compensation;<sup>38</sup> rents; royalties; the gross value of sales of stocks and bonds; income from futures contracts; capital gains distributions; the gross value of real estate sales; gambling winnings; prizes and awards; grants; agricultural subsidies; income from farmers' cooperatives; and other types of income from fiduciaries, partnerships and S corporations. Compliant filers have average income in this form of \$689; noncompliant filers have average income in this form of \$261.

Information returns data tend to understate the income of self-employed persons. Self-employment income obtained from the information returns filed for these taxpayers is about \$3.8 billion; self-employment income reported on tax returns by these taxpayers is \$5.7 billion. If self-employed persons have less income (as measured by information returns) and are also less likely to claim EITC qualifying children, then the estimated income effect might be biased downward. Self-employed persons might be less likely to claim EITC qualifying children for two reasons. First, self-employed persons have greater opportunities for under-reporting income, and a variety of empirical research suggests that they are more likely to under-report income.<sup>39</sup> If income under-reporting and child over-reporting are substitutes, then self-employed persons will be less likely to over-report children (because they are more likely to under-report income). In addition, self-employed taxpayers might be more likely to be audited (because the IRS is aware of greater opportunities for noncompliance and higher levels of noncompliance among these taxpayers). Therefore self-employed taxpayers might be reluctant to misreport a child, even if they report income correctly.

To examine the effect of self-employment income on child reporting and improve the estimation of the income effect, I add a dummy variable equal to one for taxpayers who have self-employment business or farm income, and interactions of the dummy variable with the two information returns

income variables. About 7 percent of taxpayers that did not claim the EITC and 5 percent who did claim the EITC reported self-employment income. Average income not subject to losses among self-employed taxpayers that did not claim an EITC qualifying child is \$10,699; average income not subject to losses among self-employed taxpayers that did claim a child is \$4,867. The average of other income among self-employed taxpayers that did not claim the EITC is \$4,551; the average of other income among self-employed taxpayers that claimed the EITC is \$1,023.<sup>40</sup> (Unconditional means are shown in Table 3.)

The final component of income, the refund that each taxpayer would receive at the end of the tax year (or the balance due that he or she would owe), is calculated conditional on reported income, no EITC qualifying children, and no dependent or filing status misreporting. A larger refund in the compliant state increases the filer's true after tax income, and under the assumption of decreasing absolute risk aversion this additional income is expected to be positively associated with noncompliance. On the other hand, taxpayers expecting to be satisfied with their refund and less likely to misreport than taxpayers who will receive a smaller refund. If so, the true refund will be negatively correlated with misreporting.<sup>41</sup> Compliant filers could expect an average refund of \$327. The noncompliant filers could expect an average refund of \$152.

The theoretical model presented above assumes that an individual receives utility from current period income only. In fact, a taxpayer's degree of risk aversion might depend on wealth or permanent income, rather than or in addition to current year income. Wealth and permanent income are not directly observable in tax return data. However, it is possible to estimate wealth by grossing up current year asset income, using the annual rate of return to assets. I assume that wealth is equal to interest, dividends, and income from partnerships, S-corporations, trusts and estates, divided by their average rates of return. To avoid introducing an endogenous variable, or a variable that is downwardly biased for income under-reporters, I gross up the income that is reported for the taxpayer on information returns, rather than income as reported by the taxpayer on the income tax return.<sup>42</sup>

The difference in the mean of estimated wealth for compliant and noncompliant taxpayers is striking. Average wealth among low-income taxpayers that do not claim EITC qualifying children is \$9,138. Average wealth among taxpayers that do claim children is \$700. Part of the difference in wealth among compliant and noncompliant taxpayers is associated with the difference in the age distributions of the two groups. Wealth is increasing in age, and about 9 percent of low income taxpayers who do not claim a qualifying child but less than 2 percent of ineligible taxpayers who do claim a child are aged 65 or over. Estimated mean wealth is \$4,669 among compliant taxpayers who are under age 65, and \$669 among noncompliant taxpayers who are under age 65. (In the regressions, I control for age as well as wealth.)<sup>43</sup>

As is often the case with distributions of income and wealth, the distribution of wealth among these taxpayers is highly skewed. The median level of wealth is zero, among both low income taxpayers who claimed the EITC and those who did not. About 59 percent of taxpayers who do not claim EITC qualifying children and 82 percent of taxpayers who do claim children have no estimated wealth.

### *Other variables*

The probability of detection and penalty rate, which are expected to be negatively correlated with the probability of erroneously reporting a child, are not available. However, IRS resources and practices vary across IRS regions, and taxpayers in some areas might have a higher expectation of being audited and penalized than taxpayers in other areas. Therefore I include six IRS regional dummy variables to control for variation in expected audit rates and penalties. Taxpayer behavior might also vary geographically, and these dummy variables would reflect that variation as well as variation in IRS practices. Noncompliant taxpayers are more heavily concentrated in the Southeast region and compliant taxpayers are more heavily concentrated in the Midwest and Central regions. (Taxpayers who correctly claim the EITC are also heavily concentrated in the Southeast region.)

I match the tax return data to 1990 Census data at the five digit zip code level, to obtain additional demographic information. Taxpayers who live in urban areas might be more likely to be noncompliant because they know many other people who claim the EITC. Therefore, I include the fraction of households in the taxpayer's zip code that were categorized as being in an urban area, according to the 1990 Census.<sup>44</sup> On average, 61 percent of households in the compliant taxpayers' zip code areas and 71 percent of households in the noncompliant taxpayers' zip code areas were classified as being in an urban area.

Misreporting may be intentional or unintentional, and the two types of errors are not distinguishable in the data. Tax return filers who have less education might be more likely to make unintentional errors. Therefore I include the fraction of adults in the filer's zip code with less than a high school education, according to the 1990 Census.<sup>45</sup> This variable is a measure of the education level of all adults in a taxpayer's neighborhood (rather than a direct measure of the taxpayer's education). Therefore the education variable, like the urban area variable, might reflect the likelihood that the taxpayer lives in a neighborhood with a large number of EITC recipients, as well as the probability that the taxpayer has less than a high school education. On average, the compliant filers lived in areas in which 25 percent of adults reported less than a high school education and the noncompliant filers lived in areas in which 33 percent of adults reported less than a high school education.

Other demographic control variables include age and gender, as reported in the Social Security records. In the case of a joint return, I use the age of the first taxpayer listed on the return and assign gender of "joint" to the return. The average age of both compliant and noncompliant taxpayers is 35. About 46 percent of taxpayers who did not claim a qualifying child and 47 percent of taxpayers who claimed a child were males filing as single persons or as heads of households. About 42 percent of compliant and noncompliant taxpayers were females filing as single persons or as heads of households. Twelve percent of compliant taxpayers and 11 percent of noncompliant taxpayers were married and filing jointly. Previous empirical research suggests that the level of noncompliance is higher among married taxpayers and among younger taxpayers.<sup>46</sup>

### *Results*

The model is estimated using the probit procedure. The regressions are weighted. The first column of Table 4 shows the estimated coefficients from the probit. The second column shows the estimated marginal effects of the independent variables on the probability of reporting a child, for a taxpayer with

the a predicted probability of claiming a child equal to the actual fraction of ineligible taxpayers who claim a child (about 0.08).

The estimated effect of the size of the EITC and tax benefit on the probability of reporting a child is positive and statistically significant. The estimated coefficient is  $2.3 \times 10^{-4}$  (with a standard error of  $3 \times 10^{-5}$ ), and the estimated marginal effect for the reference individual is about  $3 \times 10^{-5}$ . This suggests that a \$100 increase in the benefit of claiming a child would increase the probability that the reference individual claims a child from about 8.0 percent to 8.4 percent. On average, a 10 percent increase in the EITC and tax benefit of claiming a child will increase the predicted probability of claiming a child from 7.9 to 8.3 percent (or, by about 5 percent). Increasing the EITC only by 10 percent will increase the average probability of claiming a child by about 4 percent.

I cannot reject the hypothesis that a dollar of increased EITC or a dollar of decreased taxes obtained by reporting a child will have the same effect on compliance. When this restriction is relaxed, the estimated EITC coefficient is  $2.4 \times 10^{-4}$  (with a standard error of  $4 \times 10^{-5}$ ), the estimated tax benefit coefficient is  $1.8 \times 10^{-4}$  (with a standard error of  $1.3 \times 10^{-4}$ ), and the log likelihood is -1,604.15.

The estimated effect of the dependent/head of household dummy variable is positive and statistically significant, suggesting that taxpayers who can claim a dependent or the head of household filing status even though they cannot claim the EITC are more likely than other taxpayers to claim the credit in error.

The estimated effect of the maximum state EITC is the same sign and order of magnitude as the federal EITC effect, but statistically insignificant at the 10 percent level. (The econometric results are essentially unchanged when I instead use the value of the state EITC conditional on reported income and one child.) The estimated coefficient of the state tax dummy variable is positive and statistically significant, suggesting that federal tax return filers who are subject to state income taxes are less compliant than individuals living in states without income taxes.

For taxpayers who are not self-employed, noncompliance is decreasing in income that is not subject to losses: other income is not statistically significant. The probability of noncompliance is lower for the self-employed, suggesting that they are subject to higher rates of audit or are substituting income misreporting for child misreporting. For self-employed taxpayers, the probability of child misreporting is increasing in income that is not subject to losses and decreasing in income that is subject to losses (including forms of self-employment that are reported independently to IRS).

The estimated effect of wealth is negative and statistically significant. (Higher order income and wealth terms, included in an alternative specification of the model, are not statistically significant.) It is possible that higher permanent income and wealth are correlated with lower probabilities of child misreporting because a more affluent taxpayer can borrow or use assets to pay his or her tax bill in a low-income year. In addition, a wealthier taxpayer might not want to increase the risk of being audited in a later year (when taxable income might be higher), by cheating in the current year. Wealthier taxpayers might face a higher probability of audit in any given year, because their financial situation is more complicated. On the other hand, taxpayers with more income and wealth might have greater opportunities for misreporting income or deductions, and therefore choose to evade taxes in those ways, rather than by erroneously reporting children. Finally, taxpayers with higher levels of income and wealth might be more educated or have better access to high quality tax return preparers, and therefore might be less likely to make unintentional errors.<sup>47</sup>

These estimated effects of income (and of wealth estimated from asset income) on compliance should of course be viewed with caution, because income as reported independently on information returns may be an inadequate proxy for true income, as it excludes certain forms of income and losses. Moreover, because the EITC is a function of income, it is difficult to identify the separate effects of the EITC and income on compliance, in a cross-section model.<sup>48</sup> Fortunately the EITC varies nonlinearly with income, making it more likely that the EITC and income effects are correctly identified. Yet if noncompliance varies nonlinearly with income in a way that is correlated with the nonlinear shape of the EITC function, then the estimated EITC effect could reflect variations in compliance that are associated with income.<sup>49</sup>

The estimated probability of noncompliance is decreasing in the refund that a taxpayer can expect to receive when he or she is compliant, and increasing in the balance owed by the taxpayer when he or she is compliant. This might be because noncompliance is decreasing in income (in the form of a larger refund or smaller balance due). It might also be that taxpayers receiving larger refunds or owing smaller balances are more satisfied with the tax system and have less desire to be noncompliant. Furthermore, low income taxpayers who face a balance due at the end of the year might be likely to be noncompliant because they are liquidity constrained and unable to pay their tax bills.

Martinez-Vazquez et al. (1992) suggest that individuals may react differently to an event perceived as a loss (such as being under withheld and owing taxes at the end of the year), than to an event perceived as a gain (such as being over withheld and receiving a refund), even when the events have the same effect on net wealth. In that case, responses to refunds and balances due will not be the same size. In addition, an inability to pay one's tax bill might also cause taxpayers with a balance due to file noncompliant returns, even though they would not otherwise do so. When I allow for different responses to refunds and balances due, I find that decreases in balances due have a slightly larger impact on compliance than do increases in refunds. However, I cannot reject the hypothesis that an increase in the tax refund and a decrease in the balance due will have the same effect on compliance. In the unrestricted model, the estimated refund coefficient is  $7.7 \times 10^{-4}$  (with a standard error of  $9 \times 10^{-5}$ ), the estimated balance due coefficient is  $10.1 \times 10^{-4}$  (with a standard error of  $11 \times 10^{-5}$ ), and the log likelihood is -1,602.88.

Filers from the Southeast are more likely to erroneously claim a qualifying child and taxpayers from the Central region are less likely to erroneously claim a child. Filers living in urban areas are more likely to be noncompliant, and the estimated effect is statistically significant. Filers who live in areas where many adults have less than a high school education are significantly more likely to claim a qualifying child. The probability of noncompliance is increasing in age, but at a decreasing rate; compliance begins to improve after about age 40. Both male and female taxpayers filing as unmarried are less likely to be noncompliant than married taxpayers filing joint returns.

These econometric results imply that some ineligible taxpayers intentionally respond to increases in the size of the EITC, by deciding to claim a child.<sup>50</sup> On the other hand, the results also indicate that the incidence of noncompliance is positively correlated with lower levels of education, income and wealth, perhaps because less educated and less affluent taxpayers are more likely to make unintentional errors. The model also suggests that the size of the EITC, tax rates and observable taxpayer characteristics can explain only a fraction of noncompliance. Unintentional errors might account for a substantial portion of

the unexplained variation in the model. However, it is also likely that some of the noncompliance that is not explained by the econometric model is due to unobserved variations in expected penalties, unobserved tendencies to engage in intentional noncompliance or other factors associated with intentional noncompliance.<sup>51</sup>

### Reducing EITC Compliance Costs

One way to reduce total EITC costs (and also benefits) is to simply reduce the size of the credit or the size of the eligible population. In 1995, both the House and Senate proposed reductions in the EITC. The most substantial reductions were proposed in Senate Bill 899, The Earned Income Tax Credit Fraud Prevention Act. The bill proposed freezing the credit for taxpayers with two or more children at tax year 1995 levels, rather than allowing the full increase provided for by the Omnibus Budget Reconciliation Act of 1993. The bill also reduced the income levels at which the phase-in range ends and at which the phase-out rate begins, eliminated the indexation of these levels for inflation, eliminated the credit for workers without children, counted the full amount of Social Security benefits in income for purposes of phasing out the credit, and made other changes to the definition of income for EITC purposes. The Treasury Department estimated that in 1996, these changes would affect 19 million taxpayers who would lose an average of \$602 in EITC. Although the sponsors of the bill indicated that the primary purpose of the changes was to prevent fraud and abuse involving the credit, opponents of the bill characterized the EITC reductions as unfair tax increases on the working poor that would do little to improve compliance, and the proposed changes were not enacted.

The model estimated in this paper provides a means for estimating the likely effect of, for example, a 10 percent reduction in the EITC on EITC noncompliance. The model predicts that child misreporting resulted in \$2,987 million of EITC overclaims, under the tax year 1994 provisions. In the absence of any change in taxpayer behavior, a 10 percent reduction in the EITC would reduce the estimated amount claimed in error to \$2,688 million. However, a reduction in EITC is expected to reduce the number of ineligible taxpayers who claim a child from 2,143,000 to 2,073,000 and to reduce the amount claimed in error to \$2,577 million. Hence a 10 percent reduction in the EITC would reduce the amount of EITC erroneously claimed by taxpayers who do not have qualifying children by an estimated 14 percent.<sup>52</sup>

However, eligible recipients would also have their credit reduced by 10 percent. As a result, the reduction in erroneous claims would have only a small impact on the traditional measure of EITC noncompliance: the amount claimed in error as a percentage of the total amount claimed. Assuming that the behavior of eligible EITC claimants is as observed in the 1994 data, the model predicts that erroneous claims of EITC qualifying children in 1994 amounted to 16.7 percent of the total amount of EITC claimed (that is, to \$3.0 billion out of \$17.9 billion). If the EITC were reduced by 10 percent, erroneous qualifying child claims would fall only to an estimated 16.2 percent of the total amount of EITC claimed (that is, to \$2.6 billion out of \$16.0 billion). Because the compliance response to changes in the EITC is modest in size, and because scaling back the EITC reduces the total amount claimed as well as the amount claimed in error, reducing the EITC is likely to have a negligible impact on the EITC overclaim rate.<sup>53</sup> Perhaps more importantly, reducing the credit would diminish the

effectiveness of the EITC in inducing labor force participation and in providing income support to low income families.

More direct efforts to strengthen IRS enforcement activities and to reduce the frequency of unintentional errors might bring about greater improvements in error rates, at a much lower cost to compliant taxpayers. In response to the findings of the tax year 1993 and 1994 EITC compliance studies, the Treasury Department proposed a number of changes to the EITC eligibility criteria and administrative procedures. These changes were designed primarily to provide the IRS with more information with which to evaluate EITC claims before refunds are paid, and to make it less costly for the IRS to deny erroneous claims.

For example, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 required all EITC claimants to provide a valid Social Security Number for themselves and their EITC qualifying children. (Prior to tax year 1996, SSN=s were not required for children under the age of one; and taxpayers who could not obtain an SSN because they were undocumented workers could still claim the EITC.) Using Social Security data, the IRS can verify that the taxpayer and child exist and are the individuals to whom the SSN=s were issued. The IRS can also verify the ages of the taxpayer and child, confirm that the child=s age matches the year of birth reported on Schedule EIC, and detect multiple uses of the same SSN. The 1996 Act also allowed the IRS to treat the failure to provide a valid SSN as a mathematical or clerical error. Using the math error procedures, the IRS can deny or reduce the credit before any tax refund is paid and without auditing the tax return. Taxpayers who are denied the credit through the math error procedure may obtain the EITC if they subsequently provide a valid SSN.

The Taxpayer Relief Act of 1997 provided for several new EITC penalties, that may be levied in addition to existing taxpayer penalties. Under the 1997 Act, a taxpayer whose EITC is disallowed or reduced, and whose error is determined to be the result of negligence or intentional disregard of the EITC provisions, is not allowed to claim the EITC again for two subsequent years. A taxpayer who is found to have fraudulently claimed the EITC is not allowed to claim the credit for ten subsequent years. In addition, a taxpayer whose credit is reduced or disallowed for any reason (other than for correction of a mathematic or clerical error) must provide additional information to the IRS regarding the validity of the EITC claim, before receiving the credit again. These provisions are intended to deter taxpayers from filing erroneous claims and to provide the IRS with additional information before IRS must pay the EITC to previously noncompliant taxpayers.

The 1997 act also included new due diligence requirements for paid preparers. A paid preparer who cannot show that he or she was diligent in filing in a taxpayer=s EITC claim may be assessed a \$100 penalty (even if the taxpayer=s EITC claim is not disallowed). To demonstrate due diligence, a preparer must ask the taxpayer certain questions in order to ascertain his or her eligibility for the credit and retain this information for a period of three years. By placing the burden of proof of due diligence on the preparer and allowing the IRS to levy fines without auditing the client=s return, the provision makes it less expensive for the IRS to penalize preparers. The new requirement is also intended to educate preparers about the EITC eligibility criteria, by spelling out exactly what information is necessary to evaluate a taxpayer=s claim.

The Taxpayer Relief Act of 1997 provided the IRS with two new sources of information with which to evaluate the accuracy of EITC claims and select potentially erroneous returns for audit. The first is

the Federal Case Registry of Child Support Orders. This registry will allow the IRS to identify noncustodial parents, who are likely to fail the EITC residency test. In addition, the Social Security Administration will be required to obtain the SSNs of parents when they apply for an SSN for a minor child. This information will allow the IRS to identify individuals who are likely to fail the EITC relationship test.

The Balanced Budget Act of 1997 increased the discretionary appropriations cap for fiscal years 1997 through 2002, in order to provide additional funding for EITC compliance improvement efforts. The IRS appropriation for fiscal year 1998 included \$138 million earmarked for EITC compliance improvement efforts; the 1999 budget included \$143 million for EITC compliance. The IRS has used these funds to implement the provisions of the 1996 and 1997 Acts, by for example, developing new forms and regulations, changing the computer programs to automatically deny the EITC to taxpayers with SSN problems, and updating or developing data bases. Because many EITC errors are unintentional, the IRS has also used the appropriation to improve the clarity of EITC related forms, notices and publications, and to increase the availability of taxpayer assistance. Finally, the IRS has used a portion of the funds to audit more returns with EITC claims. The IRS estimated that it spent \$101 million dollars on administering EITC math error adjustments and conducting audits and criminal investigations related to EITC claims during fiscal year 1998; and that as a result, it prevented or recovered \$977 million in EITC overpayments.<sup>54</sup> The IRS is also conducting research to ascertain the effect of these efforts on EITC compliance rates.

## Conclusions

Efforts to target the EITC and other tax benefits to certain types of taxpayers create opportunities for unintentional taxpayer errors and incentives for intentional taxpayer misreporting. IRS data for 1994 indicate that \$4.4 billion in excess EITC was claimed, primarily due to the misreporting of EITC qualifying children. In this paper I test the hypothesis that taxpayers respond to increases in the marginal benefit of misreporting by engaging in noncompliance. I find that the probability that an ineligible taxpayer claims an EITC qualifying child is increasing in the size of the EITC. The results suggest that reducing the EITC by 10 percent would reduce EITC overclaims due to child misreporting among ineligible taxpayers by about 14 percent. However, reducing the size of the EITC would also reduce the amount of EITC that could be claimed by compliant taxpayers; and the EITC overclaim rate (defined as the amount claimed in error divided by the total amount claimed) would be reduced by a negligible amount. Efforts to reduce the frequency of unintentional errors and enhance the effectiveness of IRS enforcement activities might bring about greater improvements in EITC error rates, at a lower cost to compliant taxpayers.

Since 1993, virtually all of IRS's compliance research has focused on EITC claimants. The sampling of EITC claimants only precludes the study of EITC nonparticipation (probably the largest source of EITC underclaims). The EITC study design also creates sample selection bias and precludes the econometric modeling of some forms of EITC noncompliance. Furthermore, the errors made by EITC claimants (including misreporting filing status, misreporting family and household characteristics, and under-reporting income) can also be made by taxpayers who do not claim the EITC. Without comparable data on taxpayers who do not claim the EITC, it is impossible to fully understand the extent to which EITC overclaims are the result of the EITC itself, and the extent to which they are part of a more general compliance problem. It is also difficult to evaluate the importance of the EITC compliance problem relative to other tax compliance problems, and to efficiently allocate IRS enforcement resources.

Table 1. Sources of EITC Overclaims for Tax Year 1994

Type of Error	Amount of EITC Overclaim, millions of dollars		
	Taxpayers who claim qualifying children	Taxpayers who do not claim qualifying children	All EITC claimants
Returns with Qualifying Child Errors	\$3,080 million	Not Applicable	\$3,080 million
Residency	1,724	N/A	1,724
Relationship	559	N/A	559
AGI Tiebreaker	782	N/A	782
Age of Child	202	N/A	202
Other	136	N/A	136
Returns with Filing Status Errors	\$1,362 million	\$32 million	\$1,394 million
Returns with income errors	\$445 million	\$49 million	\$494 million
All returns with EITC overclaims	\$4,368 million	\$81 million	\$4,448 million

Note: the sum of EITC overclaims on returns with each type of errors exceeds the total amount of EITC overclaims, because some returns have more than one type of error.

Table 2: Number of Observations in the Combined Sample of Low Income Taxpayers Who Are Not Eligible to Claim EITC Qualifying Children

Gender and Reported Filing Status	Unweighted Number	Weighted Number
Non-Claimants	7,596	24,807,000
Males filing as single or head of household	2,986	11,523,000
Females filing as single or head of household	2,876	10,333,000
Married couples filing jointly and widowed filers	1,734	2,951,000
Claimants	534	2,170,000
Males filing as single or head of household	404	1,020,000
Females filing as single or head of household	116	901,000
Married couples filing jointly and widowed filers	14	249,000
Total Number of Ineligible Filers	8,130	26,978,000

Table 3: Weighted Means for Low Income Taxpayers Who Are Not Eligible to Claim EITC Qualifying Children

Variable	Filers not claiming EITC Unweighted, N=7,596 Weighted, N=24,807,000		Filers Claiming EITC Unweighted, N=534 Weighted, N=2,170,000	
	Mean	Number with Value>0	Mean	Number with Value>0
EITC increase and tax decrease from reporting one child, given reported income	1,389.37 (751.50)	24,807,000	\$1,566.31 (706.38)	2,170,000
Dummy variable = 1 if filer may claim dependent or head of household status	0.0583 (0.2342)	1,445,000	0.3560 (0.4788)	773,000
Dummy variable = 1 if filing from a state with income tax	0.8038 (0.3971)	19,940,000	0.7934 (0.4048)	1,722,000
Maximum state EITC, given one child	41.81 (149.53)	3,698,000	50.01 (190.67)	260,000
Dummy variable = 1 if filer is self-employed	0.0681 (0.2520)	1,691,000	0.0513 (0.2207)	111,000
Income not subject to losses less withheld taxes, as reported for taxpayer on information returns	9,998.13 (8,276.70)	24,121,000	9,071.81 (5,880.65)	2,013,000
Income not subject to losses less withheld taxes, if self-employed (0, if not self-employed)	729.07 (3,842.32)	1,526,000	249.76 (1,751.94)	67,000
Other income, as reported for taxpayer on information returns	689.13 (26417.38)	2,512,000	261.30 (3,802.88)	131,000
Other income, if self-employed (0, if not self-employed)	310.14 (25,802.78)	799,000	52.48 (515.03)	35,000
Refund filer receives with no qualifying child (negative if taxpayer has a balance due)	327.46 (493.60)	22,125,000	152.24 (548.12)	1,559,000
Wealth, imputed from income on information returns	9,137.83 (52,168.04)	10,270,000	699.87 (4,837.93)	389,000
Dummy variable = 1 if filing from the Western region.	0.1404 (0.3474)	3,483,000	0.1603 (0.3669)	348,000
Dummy variable = 1 if filing from the Southwest region.	0.1381 (0.3450)	3,425,000	0.1379 (0.3448)	299,000
Dummy variable = 1 if filing from the Midwest region.	0.1485 (0.3556)	3,685,000	0.0982 (0.2975)	213,000
Dummy variable = 1 if filing from the	0.1355	3,362,000	0.0561	122,000

Variable	Filers not claiming EITC Unweighted, N=7,596 Weighted, N=24,807,000		Filers Claiming EITC Unweighted, N=534 Weighted, N=2,170,000	
	Mean	Number with Value>0	Mean	Number with Value>0
Central region.	(0.3423)		(0.2302)	
Dummy variable = 1 if filing from the Southeast region.	0.2017 (0.4013)	5,005,000	0.3297 (0.4701)	716,000
Dummy variable = 1 if filing from the Mid-Atlantic region.	0.1196 (0.3245)	2,968,000	0.1259 (0.3318)	273,000
Fraction of housing units in filer's zip code that are in an urban area	0.6103 (0.4603)	16,445,000	0.7143 (0.4311)	1,622,000
Fraction of adults in zip code with less than a high school education	0.2487 (0.1212)	24,796,000	0.3263 (0.1354)	*
Age of the primary filer	34.77 (16.91)	24,807,000	35.18 (11.02)	2,170,000
Dummy variable = 1 if filer is male filing as single or head of household	0.4645 (0.4987)	11,523,000	0.4702 (0.4991)	1,020,000
Dummy variable = 1 if filer is female filing as single or head of household	0.4165 (0.4930)	10,333,000	0.4153 (0.4928)	901,000

Standard deviations shown in parentheses.

\* Data from cells based on fewer than three observations (or from cells for which the complement is based on fewer than three observations) are not disclosed, to protect taxpayer confidentiality.

Table 4: Estimates of the Probability of Reporting an EITC Qualifying Child

Variable	Coefficient	Marginal Effect
Intercept	-5.2021** (0.2801)	-0.7766** (0.0418)
EITC increase and tax decrease from reporting one child, given reported income	0.0002** (3*10 <sup>-5</sup> )	3*10 <sup>-5</sup> ** (1*10 <sup>-5</sup> )
Dummy variable = 1 if allowed head of household or dependent	1.3905** (0.0680)	0.2076** (0.0101)
Maximum state EITC for one child	0.0001 (0.0002)	1*10 <sup>-5</sup> (2*10 <sup>-5</sup> )
Dummy variable = 1 if from a state with income tax	0.2140** (0.0709)	0.0320** (0.0106)
Dummy variable = 1 if taxpayer is self-employed	-0.8969** (0.1946)	-0.1339** (0.0290)
Income not subject to losses less withheld taxes, per information returns	-2*10 <sup>-5</sup> ** (4*10 <sup>-6</sup> )	-2*10 <sup>-6</sup> ** (1*10 <sup>-6</sup> )
Income not subject to losses less withheld taxes, if self-employed	4*10 <sup>-5</sup> ** (2*10 <sup>-5</sup> )	1*10 <sup>-5</sup> ** (3*10 <sup>-6</sup> )
Other income, per information returns	1*10 <sup>-5</sup> (1*10 <sup>-5</sup> )	2*10 <sup>-6</sup> (1*10 <sup>-6</sup> )
Other income, per information returns, if self-employed	-0.0001* (3*10 <sup>-5</sup> )	-1*10 <sup>-5</sup> * (5*10 <sup>-6</sup> )
Refund filer receives with no qualifying child (negative if taxpayer has a balance due)	-0.0009** (0.0001)	-0.0001** (1*10 <sup>-5</sup> )
Wealth, estimated from income on information returns	-3*10 <sup>-5</sup> ** (1*10 <sup>-5</sup> )	-5*10 <sup>-6</sup> ** (1*10 <sup>-6</sup> )
Dummy variable = 1 if from the Western region	-0.0017 (0.1040)	-0.0003 (0.0155)
Dummy variable = 1 if from the Southwest region	0.1543 (0.1121)	0.0230 (0.0167)
Dummy variable = 1 if from the Midwest region	0.0022 (0.1096)	0.0003 (0.0164)
Dummy variable = 1 if from the Central region	-0.2018* (0.1198)	-0.0301* (0.0179)
Dummy variable = 1 if from the Southeast region	0.5006** (0.0975)	0.0747** (0.0146)

Variable	Coefficient	Marginal Effect
Dummy variable = 1 if from the Mid-Atlantic region	0.1683 (0.1059)	0.0251 (0.0158)
Fraction of housing units in zip code that are in an urban area	0.4097** (0.0594)	0.0612** (0.0087)
Fraction of adults in zip code with less than a high school education	2.2194** (0.1883)	0.3313** (0.0281)
Age of the primary filer	0.1568** (0.0134)	0.0234** (0.0020)
Age squared	-0.0020** (0.0002)	-0.0003** ( $3 \times 10^{-5}$ )
Dummy variable = 1 if male filing as single or head of household	-0.2876** (0.0949)	-0.0429** (0.0142)
Dummy variable = 1 if female filing as single or head of household	-0.1994** (0.0943)	-0.0298** (0.0141)
Log likelihood	-1,604.23	
$1 - (\sum_i \epsilon_{1i}^2 / \sum(Y_{1i} - Y_m)^2)$	0.2208	
Average predicted probability of claiming a child	0.0794** (0.0026)	
Average predicted increase in probability of claiming a child, due to 10 percent increase in the EITC	0.0030** (0.0005)	
Average predicted increase in probability of claiming a child, due to 10 percent increase in EITC and tax benefit	0.0038** (0.0006)	

Standard errors are shown in parentheses.

\* indicates significant at the 10 percent level.

\*\* indicates significant at the 5 percent level.

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### Endnotes

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1. U.S. Senate, Committee on Finance (1975), p. 33.
  2. See Skinner and Slemrod (1985) for a broad discussion of the effects of tax evasion on economic efficiency and equity.
  3. See McCubbin (1999) for a description of the characteristics of compliant and noncompliant EITC claimants for 1994. See also Liebman (1999) for a description of ineligible EITC recipients and a discussion of how they should be weighted in the social welfare function.
  4. The IRS postponed indefinitely a Taxpayer Compliance Measurement Program (TCMP) study planned for tax year 1994, citing budget constraints. The IRS is also aware that TCMP audits are burdensome to the selected taxpayers and unpopular with many politicians. The Treasury and General Government Appropriations Act as passed by the Senate in September 1998 included a nonbinding Sense of the Senate Resolution stating that *the Internal Revenue Service should not conduct random audits of the general population of taxpayers or tax returns*.<sup>7</sup>
  5. Internal Revenue Service (1997a), Table A.
  6. Results from this compliance study were released by the Internal Revenue Service (1997b) and Scholz, Deputy Assistant Secretary of the Treasury for Tax Analysis (1997). The U.S. General Accounting Office (1998) reviewed the IRS study and subsequent Treasury analysis.
  7. All estimates regarding taxpayers who claimed the credit for workers without qualifying children should be used with caution, as they are derived from a sample of only 99 returns.
  8. Note that the EITC qualifying child need not be the taxpayer's dependent. For example, a welfare recipient who is unable to claim a dependent exemption for her child because she does not

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provide more than one-half of the total support for the child may still claim the EITC. On the other hand, although a noncustodial parent may be allowed to claim a dependent exemption for a child that he or she supports, a noncustodial parent may not claim the EITC. For additional details about the EITC eligibility criteria for 1994 and modifications to the credit made since 1994, see McCubbin (1999).

9. On the other hand, the EITC can create a marriage bonus if, for example, a low income taxpayer with earnings marries a nonworker with children. Dickert-Conlin and Houser (1998) find that a substantial portion of low income persons who lose welfare benefits by marrying, receive a marriage bonus through the tax system. See also Holtzblatt and Rebelein (1999) for a discussion of measuring EITC marriage penalties.

10. The failure to account for the nonsampled spouse's behavior can lead to erroneous estimates of the EITC overclaim rate, when the filing status is changed to married filing joint and both the sampled taxpayer and the spouse claimed the EITC. In that case, the excess EITC amount associated with the new, joint return should include any amount claimed by the spouse who was not sampled. In addition, the weight associated with the corrected joint return should reflect the joint probability that either member of the couple was sampled (rather than only the probability that the selected taxpayer was sampled). The failure to include the EITC overclaim of the spouse leads to the underestimation of the error rate; the failure to correct the weight for the observation leads to the overestimation of the error rate. The TCMP samples exclude taxpayers whose filing status was change to married filing jointly from any other status, during the course of the audit. Hence the TCMP estimates of EITC error rates and of the overall tax gap exclude a potentially important form of noncompliance.

11. If the filer's AGI is less than the point at which the phase-out begins, then the credit is computed based on earned income. If the filer's AGI is greater than the point at which the phase-out begins, then the credit is computed using the income concept (earned income or AGI) that results in the smaller credit. Earned income is the sum of wages, self-employment income and certain nontaxable earned income, less one-half of any self-employment tax. Nontaxable earned income includes: deferred or reduced compensation (such as employee contributions to a 401(k) retirement savings plan or a cafeteria benefits plan); excludable dependent care benefits; housing and subsistence allowances for United States military personnel; and any other nontaxable employee compensation.

12. See for example Steuerle (1993).

13. This estimate should be used with caution, as it is based on very few observations.

14. Internal Revenue Code section 6103(l) provides for the disclosure of tax return information by the Social Security Administration and the IRS to child support enforcement agencies and agencies administering Temporary Assistance to Needy Families (formerly Aid to Families with Dependent Children), Food Stamps, Unemployment Compensation and other programs.

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15. See for example the American Institute of Certified Public Accountants (1997).

16. It is likely that additional qualifying children were claimed as dependents but could not be matched to the dependent information, due to limitations in the EITC and dependent data extracted from the returns.

17. See Brown (1997).

18. See Sparrow (1993) and Yin (1995) for examples.

19. Another 1.6 percent of taxpayers who claimed the EITC during the study period used IRS assistance or volunteer assistance programs to complete their returns. The estimated error rate among these returns is unreliable, as it is based on a very small number of observations.

20. Erard (1993) finds that self-selection across preparation modes increases the observed level of noncompliance.

21. See Holtzblatt (1992) and McCubbin (1999) for a discussion of findings from IRS's TCMP data for 1985 and 1988, and how these findings have shaped EITC policy.

22. I focus on the problem of EITC qualifying child misreporting because it accounts for more than two-thirds of the amount of EITC overclaimed. In McCubbin (1997) and McCubbin (1999) I examine income under-reporting by eligible EITC claimants. The design of the EITC compliance study makes it virtually impossible to model other forms of EITC noncompliance, such as the under-reporting of income by ineligible EITC claimants and the misreporting of filing status.

23. While the SOI data are unaudited, they are corrected for computational errors and other internal inconsistencies. See Internal Revenue Service (1997a) for a description of the tax year 1994 study of individual income tax returns.

24. See Internal Revenue Service (1997b) and McCubbin (1999) for discussions of the SOI and CID sample designs and comparisons of EITC population estimates obtained from the two samples. One disadvantage of this approach is that it requires me to assume that filers in the SOI sample who did not claim EITC qualifying children did not have EITC qualifying children. Scholz (1994) has estimated that for tax year 1990, 13.6 to 19.5 percent of eligible taxpayers failed to claim the EITC. However, many EITC nonparticipants do not file tax returns, and therefore would not appear in the SOI sample. Hence I argue that the SOI sample includes few taxpayers who were eligible for the EITC but failed to claim it.

25. Yitzhaki (1974) first demonstrated that when the costs (and benefits) of noncompliance are functions of the tax under-reported (rather than direct functions of income under-reported), then

changes in the marginal tax rate generate income effects but no substitution effect. The income effect is zero for compliant taxpayers; and, under the assumption of decreasing absolute risk aversion, the income effect is negative for initially noncompliant taxpayers. Therefore under the Yitzhaki model, an increase in tax rates or in the benefit of claiming a child cannot induce initially compliant taxpayers to become noncompliant, and it will induce an improvement in compliance among initially noncompliant taxpayers.

26. This specification is written as though the marginal income tax rate is constant. The empirical specification of the model allows the income tax to vary nonlinearly with income and family characteristics. The theoretical model also assumes that the EITC is a continuously differentiable function of income and the number of children. The EITC is not a continuously differentiable function and  $E(y, x)$  is appropriately viewed as a continuously differentiable approximation of the actual EITC. In addition, this specification allows the reported number of children to be a continuous variable, whereas a taxpayer must in fact report a discrete number of children. Specifying  $E(y, x)$  as a continuous function and  $x_r$  as a continuous variable allows me to use calculus to examine the optimal reporting decision and to explore how the optimum will change with tax policy parameters, but it should be recognized that actual taxpayers might be unable to reach the optimum. In addition, this specification assumes that all children who are claimed for EITC purposes are also claimed as dependents. This need not be the case; and while the taxpayer may claim a maximum of two EITC qualifying children, the number of dependents is not limited. However, specifying different child variables complicates the theoretical model without adding additional insight.

27. Internal Revenue Code Sections 6662 and 6663. The civil penalties are not additive; the IRS may not assess the accuracy related penalty on amounts subject to the fraud penalty.

28. Internal Revenue Code Sections 7206 and 7201. Convicted taxpayers are also liable for the costs of prosecution.

29. In addition to these penalties, there are several new EITC specific penalties for noncompliance, which were not in effect for tax year 1994. There are also other penalties, such as sanctions for failure to file a return and for failure to make estimated tax payments, that are not likely to apply to EITC claimants.

30. In other words, a positive first order condition (when evaluated at  $x_r=0$ ) is a necessary condition for child reporting to occur. Because the taxpayer cannot report a fraction of a child, a positive first order condition is not a sufficient condition for child reporting to occur. Examination of the first order condition for reported children about  $y_r=y_t$  and  $x_r=x_t$  (full compliance) demonstrates the importance of the penalty function specification. Given  $y_r=y_t$  and  $x_r=x_t$ , child over-reporting will occur if:

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click here to view equation.

That is, child misreporting will occur if the marginal benefit exceeds the expected marginal cost. If the

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penalty is a function only of  $T$  and not also a function of  $x_r$ , then the second term on the right hand side vanishes, and this condition can be reduced to  $1 > p[M\pi/MT]$ . In other words, the incidence of noncompliance will depend on the marginal penalty and probability of detection only, and not on the EITC or tax rate. However when the penalty is also a function of  $x_r$ , then  $1 > p[M\pi/MT]$  is a necessary, but not a sufficient condition for misreporting to occur. Moreover, it is now possible that a change in the EITC will affect the incidence of misreporting. See McCubbin (1999) for examples of other cost functions (in which the probability of detection and disutility from noncompliance are direct functions of the number of children overstated and amount of income understated) that can generate this result.

31. The IRS disallowed at least one dependent exemption in 69 percent of cases where the taxpayer claimed a dependent and erroneously claimed the EITC. The IRS disallowed the head of household filing status in 92 percent of cases where the taxpayer claimed that filing status and erroneously claimed the EITC. Because the SOI data are unaudited, I do not know whether or not filing statuses and dependent exemptions were correctly reported by taxpayers who did not claim the EITC. However, it is clear that few low income taxpayers who did not claim the EITC claimed dependents or the head of household filing status, whereas most of the filers who erroneously claimed the EITC also claimed dependents and the head of household filing status. Therefore it seems reasonable to assume that the ineligible taxpayers who refrained from claiming the EITC also correctly reported their filing statuses and dependent exemptions. I adopt this assumption and calculate the reduction in income tax liability resulting from claiming an additional dependent and the head of household filing status relative to what is reported by taxpayers who did not claim an EITC qualifying child, and relative to what is allowed for taxpayers who did claim a qualifying child. The econometric results are not very different when alternative assumptions (including the assumption that none of the taxpayers in the sample should claim a dependent or the head of household filing status) are imposed. See McCubbin (1999) for details.

32. It would of course be preferable to define the variable as determined by audit, both for taxpayers who claimed the EITC and for taxpayers who did not claim the EITC. However as noted above, few taxpayers who did not claim the EITC claimed dependents or the head of household filing status. Therefore, I argue that it is not unreasonable to assume that taxpayers who refrain from claiming the EITC correctly reported their dependents and filing statuses. The econometric results are not markedly different when alternative assumptions are imposed.

33. It is also possible that the IRS did not detect all of the dependent and filing status errors among the taxpayers who erroneously claimed the EITC. If erroneous head of household filing status and dependent claims were allowed, then the tax benefit variable is too low for some noncompliant observations, causing the coefficient to be biased downward. In addition, the dummy variable for taxpayers with a dependent or the head of household filing status might be picking up the correlation between undetected erroneous dependent and head of household filing status claims and erroneous EITC claims, rather than a correlation between correct dependent and head of household filing status claims and erroneous EITC claims.

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34. The states without individual income taxes in 1994 were Alaska, Florida, Nevada, South Dakota, Texas, Washington and Wyoming. Internal Revenue Code section 6103(d) allows for the disclosure of Federal tax return information to State tax agencies.

35. In 1994, these states were Iowa, Maryland, Minnesota, New York, Rhode Island, Vermont and Wisconsin.

36. See Robben et al. (1990), Martinez- Vazquez et al. (1992) and Carroll (1992).

37. Unlike the CID and SOI tax return data, the information returns data are unedited, and discrepancies between the information return and the tax return may reflect errors in the information returns data, as well as taxpayer noncompliance. I correct the information returns data for some obvious errors, including duplicate and amended information returns, and mismatches attributable to misreported Social Security Numbers.

38. Nonemployee compensation is a payment for services made by a firm or an individual engaged in a trade or business to an individual who is not an employee. It is a form of self-employment income reported to the recipient and to the IRS on Form 1099-MISC, and should generally be reported by the recipient on Schedule C and the corresponding line of Form 1040.

39. See for example Clotfelter (1983), Feinstein (1991), Erard (1992) and McCubbin (1997 and 1999).

40. If income and child reporting decisions are correlated, then these variables may be endogenous, because the self-employment dummy variable is based on income as observed on the tax return. However, because I use a dummy variable and the dummy variable interacted with exogenous income measures, rather than the amount of reported self-employment income, the variables are only endogenous if taxpayers have self-employment earnings and do not report any of it (or have no self-employment earnings but report a nonzero amount).

41. The empirical specification allows for the possibility that the amount of withheld taxes,  $w$ , is misreported by the taxpayer. If the taxpayer misreports withheld taxes, then true taxable income is equal to  $[y_t - w_t] + [w_r - \tau[y_r - \delta x_r] + E(y_r, x_r)]$ , where  $w_t$  is the true amount withheld and  $w_r$  is the reported amount. Therefore I use the amount of taxes reported from independent sources in the measure of income received during the year; and withheld taxes as reported by the taxpayer in the refund variable.

42. This wealth measure excludes some important assets such as owner occupied housing and corporate stocks that do not generate dividend income, because unrealized capital gains income is not observed in either the tax return or the information returns data. In grossing up observable asset income, I assume that the nominal rate of return on government bonds is equal to 7.41 percent. I assume that the rate of return on tax exempt securities is equal to the average yield of tax exempt money

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market funds, state and local government bonds and municipal bonds (weighting each rate of return by the amount of money held in that form), or 5.70 percent. I assume that the rate of return on other interest bearing assets is equal to the weighted average return of savings accounts, negotiable orders of withdrawal and certificates of deposit, or 3.16 percent. I assume that the ratio of dividends to price on corporate common stock is 2.82 percent. See Board of Governors of the Federal Reserve System (1995), Tables 12 and 18. I assume that the rate of return on partnership, S-Corporation and fiduciary assets is equal to the amount of income distributed to partners in the finance, insurance and real estate industry, divided by the amount of assets held by these partnerships, or 3.12 percent. See Wheeler (1996), Figure D and Table 5. I limit the calculation to partnerships in the finance, insurance and real estate sectors because based on my review of the information returns, most partnership and S-Corporation income for the taxpayers in my sample appears to be associated with the real estate sector.

43. Note that some of these relatively wealthy but low income taxpayers would not be eligible for the EITC for 1996 and later years, even if they had a qualifying child. Beginning in 1996, taxpayers with investment income over \$2,200 are not eligible for the credit, and taxpayers must add tax exempt interest and certain losses to AGI for calculating the credit. The econometric results are largely unchanged when taxpayers who would not be eligible for the EITC under current law are excluded from the sample. The results are also unchanged when taxpayers over age 64 are excluded from the sample.

44. See U.S. Department of Commerce, Bureau of the Census (1992), Table H5. This fraction is essentially a dummy variable equal to one if the filer's neighborhood was classified as urban, because few zip codes contain both urban and nonurban areas.

45. See U.S. Department of Commerce, Bureau of the Census (1992), Table P29.

46. Note that because only EITC claimants were audited, the gender variables are based on filing status as reported by the taxpayer, rather than as determined by audit. About 17 percent of the EITC ineligible EITC claimants who filed as single or as head of household should have filed as married. To the extent that filing status errors are correlated with child reporting errors, the gender variables are endogenous. The econometric results are largely unchanged, when the gender variables are excluded.

47. I have not included the effect of paid preparers, because the use of a paid preparer (and the type of paid preparer) might be endogenous to the compliance decision. In addition, the EITC data and Erard (1993) suggest that compliance varies substantially across different types of paid preparers. I cannot identify the type of paid preparer in the SOI data for taxpayers who do not claim the EITC. When I include a dummy variable equal to one for taxpayers who use any type of paid preparer, the estimated paid preparer effect is positive and statistically significant; and the average effect of a 10 percent increase in the EITC is reduced by about 8 percent.

48. Because the EITC and tax rates have changed over time, time series data could be used to disentangle the effects of income and other factors on compliance. The IRS did conduct a small study

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of taxpayers who claimed the EITC on returns filed electronically in January 1994, for tax year 1993. However, while very early, electronic filers appear to be fairly representative of EITC claimants, they do not appear to be representative of the population of ineligible taxpayers. For example, the tax year 1994 data indicate that about 27 million low income taxpayers who were not eligible for the EITC filed tax returns through April 15, 1995; and that about 8 percent of these ineligible taxpayers claimed the EITC. Tax year 1993 data indicate that about 700,000 low income, ineligible taxpayers filed electronically through January 28, 1994; and that 30 percent of them claimed the EITC. It appears that EITC claimants (compliant and noncompliant) are much more likely than other taxpayers to file electronically, very early in the year. Hence noncompliant, ineligible EITC claimants are over-represented by the sample of early, electronic tax return data, relative to compliant EITC ineligible taxpayers.

49. Liebman (1995) suggests that taxpayers in the EITC phase-in range might be less likely to be noncompliant because they are likely to be younger and have less complicated family situations. Taxpayers in the plateau might have more complicated family circumstances and be more likely to make errors. Taxpayers in the phase-out range might tend to be older, have more stable family situations, and be less likely to make errors. If so, then the estimated EITC effect will reflect the correlation between these taxpayer characteristics and income, rather than (or in addition to) any behavioral response to the EITC. The tax data for 1994 do show an increase in age and a decrease in the use of the single filing status, correlated with increases in income. However, the data do not show clear differences between taxpayers in the EITC plateau (where the benefit of claiming a child is highest), and taxpayers with higher or lower incomes. For example, the average age of both ineligible taxpayers in the phase-in range and those in the plateau is 33 years; and 14 percent of both ineligible taxpayers in the plateau and ineligible taxpayers in the phase-out claim the head of household filing status.

50. Liebman (1995) also finds that erroneous EITC claims are increasing in the size of the credit, and concludes that this response is evidence of taxpayer fraud.

51. The above estimates assume that all of the explanatory variables, including those conditioned on reported income, are exogenous. However, income as well as family characteristics may be misreported, and the qualifying child and income reporting decisions may be correlated. If there are unobservable determinants of both income and child misreporting, such as the willingness to engage in any illegal activity, then variables conditioned on reported income will be correlated with unobserved determinants of child misreporting and with the error term in the qualifying child equation. In particular, if there is an unobservable tendency towards both types of misreporting, then the estimated EITC effect may be biased upward. This is because income under-reporting by taxpayers in the EITC phase-out range (and income over-reporting by taxpayers in the phase-in range) increases the benefit of reporting a child. As a result, we might observe a spurious correlation between a higher EITC benefit and a propensity for child misreporting. Similarly, income misreporting might increase the taxpayer's refund. If so, we might observe a spurious, positive correlation between large refunds and the incidence of child

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misreporting.

On the other hand, it is likely that the probability of audit and the marginal penalty for noncompliance are increasing in the level of noncompliance. As a result, misreporting income will reduce the expected net benefit of misreporting the number of children (and vice versa). I do not observe the expected penalty and audit rate conditional on reported income, and these variables are therefore omitted from the regression equations. The variables that are conditioned on reported AGI may be correlated with the error term in the qualifying child equation, because they are correlated with omitted penalty and audit rate effects. Specifically, if income misreporting increases both the observed gross benefit of reporting a child and the expected penalty from misreporting a child, then the estimated effect of the EITC on noncompliance may be biased downward. Similarly, income under-reporting increases the value of the tax refund, but also the expected penalty for child misreporting. Hence we might observe a negative correlation between the refund conditional on reported income and the incidence of child misreporting, even if the effect of an exogenous increase in the tax refund is to increase child misreporting.

Therefore I have also modeled income and child reporting as a simultaneous equations system. I find evidence that the estimated magnitude of the EITC and tax benefit effect is somewhat smaller (and the refund effect is more negative) than that estimated in the single equation models. For example, the simultaneous equations model suggests that increasing the EITC benefit by 10 percent will increase the number of ineligible EITC claimants by about 2.8 percent. Using the single equation model, I estimate that increasing the EITC benefit by 10 percent will increase the number of EITC claimants by about 3.8 percent. The reduction in the estimated EITC effect (and increase in the refund effect) after accounting for reported income suggests that income under-reporting and child over-reporting are positively correlated. However, the difference in the coefficient estimates is small relative to their standard errors, and not likely to be statistically significant. See McCubbin (1999) for details.

52. This simulation assumes that 30 percent of taxpayers who are expected to claim at least one qualifying child would claim two children. In addition to reducing the amount of EITC claimed, a 10 percent reduction in the EITC would reduce the amount of tax under-reported due to child over-reporting among ineligible taxpayers by an estimated \$29 million.

53. This result is obtained under a variety of econometric and simulation specifications, including simulations which incorporate changes in income under-reporting by EITC eligible taxpayers.

54. Internal Revenue Service (1999).

