

**Householder Response to the Earned Income Tax Credit:  
Path of Sustenance or Road to Asset Building<sup>1</sup>**

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<sup>1</sup> The views expressed in this working paper are those of the authors and do not necessarily represent the opinions of the Federal Reserve Bank of New York or the Board of Governors of the Federal Reserve System.

# Householder Response to the Earned Income Tax Credit: Path of Sustenance or Road to Asset Building

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## **ABSTRACT**

This study seeks to gain a more complete picture about how the earned income tax credit program influences consumer expenditure and saving decisions. Based on 2003 tax year survey data collected from over 18,000 taxpayers participating at the Volunteer Income Tax Assistance (VITA) sites administered by FoodChange, a nonprofit organization in New York City, we find that a large proportion of lower-income taxpayers expect to use the majority of their refund for the purpose of paying debt and other more immediate expenses. Even so, 15 percent of the unbanked taxpayers who received a positive refund opened a savings account.

The results from the empirical investigation determine that unbanked taxpayers are significantly more likely to open a savings account and that opening an account is positively related to the age of the taxpayer and the size of the refund. Having a prior relationship for tax preparation services with the nonprofit organization also significantly increases the likelihood that an unbanked taxpayer opens a savings account. This finding suggests that VITA sites sponsored by nonprofit organizations can play an important role in helping to move lower-income consumers into the financial mainstream and potentially facilitating asset-building behavior. This study contributes to the growing body of literature about programs that encourage participation in the financial mainstream.

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**By**

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## **1. Introduction**

Each year the federal earned income tax credit (EITC) lifts more children out of poverty than any other government program.<sup>1</sup> For the 2003 tax year, roughly 21 million families and individuals filing federal income tax returns claimed the federal EITC, for a total refund of \$38 billion.<sup>2</sup> This program promotes workforce participation and helps raise family income above poverty.<sup>3</sup>

Much research has been undertaken to inform policy about labor supply effects resulting from changes in the EITC program. Less obvious is the impact that this tax policy is having on consumer expenditure or savings decisions.<sup>4</sup> The purpose of this study is to gain a more complete picture about these complex consumer decisions. In particular, we are interested in learning how these refunds are used and whether or not unbanked EITC-eligible taxpayers enter the financial mainstream by opening a savings account with their refund.

Savings funds provide a family with greater financial security, giving them a cushion against unexpected or extraordinary expenses. Money held in a mainstream savings account is one of numerous ways people can save. Having a savings account,

however, has several distinct advantages. These funds earn interest income and are safely held in an account insured by the Federal Deposit Insurance Corporation. For unbanked taxpayers, opening a savings account is also the entree into the financial mainstream.

To better serve lower-income working families, the Internal Revenue Service, in partnership with local community nonprofit organizations, has established Volunteer Income Tax Assistance (VITA) programs across the U.S. to provide free tax preparation services. Volunteers sponsored by these nonprofit organizations receive training to help prepare basic tax returns. Typically, these VITA sites are located in community or neighborhood centers, libraries, schools, shopping malls, and other convenient locations. Increasingly, financial institutions are participating at VITA sites in numerous ways. Some offer services at branch locations used as VITA sites, while others provide staff as volunteer tax preparers. A number of financial institutions offer savings accounts at VITA sites to help unbanked taxpayers gain access to electronic filing. Numerous financial institutions offer a combination of these services in their communities. Like many other states, New York has aimed to increase EITC participation through outreach efforts and the additional use of these VITA sites.<sup>5</sup>

A few studies find that EITC funds are used primarily to pay bills or to purchase durable goods that enhance the household's economic well being. More recently, research has shown that this program can also be used to initiate asset building through saving. However, it is unclear whether this is a viable, longer-term opportunity for lower-income families. This study employs information collected from a large sample of lower-income taxpayers participating in the 2003 tax year EITC program administered by FoodChange (formally the Community Food Resource Center), a large advocacy and

direct service nonprofit organization in the New York City area. To determine whether or not this tax policy provides additional incentives for saving by lower-income working families, we seek answers to the following questions. First, how do EITC-eligible families tend to use their refund? Second, does this decision differ between banked and unbanked families? Third, what factors influence the EITC-eligible taxpayer's decision to open a savings account? For example, are taxpayers who receive a relatively large refund more likely to open a savings account than those who receive a smaller refund?

The remainder of this study is outlined as follows. Section 2 describes the EITC program and discusses some of the challenges in promoting asset building. An overview of the literature is given in Section 3. Section 4 describes the data used in this analysis and is followed by Section 5, which describes the empirical investigation and results. The final section discusses the future research being undertaken for the 2004 tax year.

## **2. The EITC Program**

The EITC became available to lower-income workers in 1975 to help offset the increasing burden of Social Security taxes.<sup>6</sup> This tax program has become a central part of federal and state efforts to combat poverty while promoting workforce participation. For 2003, the U.S. Census reports that 35.9 million people (12.5 percent) had income below the poverty threshold.<sup>7</sup> This represents an increase from the previous year when 34.6 million people had below-poverty income. Nationwide, children represent 36 percent of the population below poverty. The 2003 report also finds that 25 percent of U.S. workers earned wage incomes below poverty. Of these workers, 30 percent were employed full-time year-round, while the remaining worked part-time.

Earned income and the size of the family determine the amount of the EITC. To qualify for the credit in the 2003 tax year, both the earned income and the adjusted gross income had to be less than \$29,665 for a single taxpayer with one qualifying child (\$30,666 if married filing jointly), \$33,692 for a single taxpayer with more than one qualifying child (\$34,692 if married filing jointly), and \$11,230 for a single taxpayer with no qualifying children (\$12,230 if married filing jointly).<sup>8</sup> As shown in Figure 1, the credit for the 2003 tax year is capped at \$4,204 for a family with two children and \$2,547 for a family with one child. The phasing out of this credit is shown as a declining scale as family income rises. The EITC can make a substantial difference in the spending and saving activities of these working poor families and is purported to be a more effective anti-poverty device than other policy tools such as minimum wage legislation.<sup>9</sup>

Since the enactment of federal welfare reform in 1995, welfare rates, labor force participation, and poverty rates in the state of New York have changed dramatically. In 1995 there were over 1,600,000 welfare recipients. By 2003, this figure had dropped to roughly 600,000. Concurrently over this period, the workforce participation rate of single mothers with children rose from about 55 percent to 77 percent. The poverty rate for the children of single mothers fell from 60 percent to close to 47 percent. In part, the availability of the EITC has helped move these children and families out of poverty.<sup>10</sup> New York is one of 16 states with a state EITC program. The state calculation is 30 percent of the federal EITC and is expected to reach \$677 million for tax year 2004. As an example, for a single parent with two children residing in the state of New York earning \$6.50 per hour, the annual wage and salary income after payroll taxes is \$12,485. Receipt of state and federal EITC raises this family's annual income to \$17,764.<sup>11</sup>

Most would agree that the preparation and filing of annual federal and state taxes is not a trivial matter. It is estimated that two out of every three EITC recipients retain the professional services of commercial tax preparers. These businesses typically charge an average of \$100 to prepare and electronically submit federal and state income taxes for lower-income taxpayers. Although it is likely that lower-income taxpayers have benefited from the services provided by these organizations, there is an ongoing debate as to whether the cost for these services is competitive or equitable. Consumer advocacy groups have been critical about the fees charged by tax preparation companies for rapid tax refunds (short-term loans).<sup>12</sup> Even if the fees charged were not extraordinarily high, hundreds of millions of dollars are being redistributed from lower-income taxpayers to tax preparers annually.<sup>13</sup> In an attempt to reverse this trend, an increasing number of nonprofit organizations are making free tax preparation clinics available to lower-income and EITC-eligible families. These organizations help lower-income families complete their federal and state tax returns and obtain their full tax refund more quickly. According to the New York state's Office of Temporary and Disability Assistance, EITC-eligible taxpayers save between \$130 and \$230 by having their federal and state taxes prepared at a VITA site.

### ***Asset-Building Challenges***

Encouraging EITC recipients to participate in programs that foster asset-building behavior may be challenging for several reasons. It may be difficult for a lower-income family to set aside income for asset-building purposes, even if the family *desires* to save. As an example, taxpayers that receive the largest EITC refunds are likely to be among those families with fairly low incomes and/or larger numbers of children. The financial

demands faced by these lower-income, larger families may limit their ability to save at least a portion of their EITC refund.

Another potential challenge relates to the ability of lower-income families to accumulate assets when they do not possess a transaction account (i.e., a checking or a savings account). Research shows that lower-income families are most likely to be unbanked.<sup>14</sup> One way to promote mainstream participation is to offer unbanked EITC-eligible families the opportunity to open a savings account, thereby helping to facilitate the asset-building process.

How EITC-sourced dollars are viewed for certain means-tested benefits raises another potential complication to the asset-building process. When an EITC eligible-family receives a refund, most benefits are not immediately affected. However, retaining EITC-sourced funds in the form of assets, defined as resources in the benefits eligibility guidelines, may jeopardize future eligibility for certain public benefits. The complexity and variability of the eligibility criteria for many income-support programs may deter some families from holding assets in a deposit account.<sup>15</sup>

### **3. Overview of the Literature**

The EITC is typically received in a lump sum, making it useful for purchasing large durable goods as well as for paying past and present living expenses.<sup>16</sup> It also represents an opportunity for families to save for unplanned needs (e.g., precautionary savings), future consumption (i.e., income smoothing), or asset-building purposes. The literature has focused on three major areas where the EITC may be influential: recipient labor force participation, family expenditures, and household asset building.

### ***Labor Supply***

There is a growing body of literature focusing on how recent expansions to the EITC program have influenced labor supply (labor force participation and/or hours worked) and family income for taxpayers with differing marital status. For example, Eissa and Liebman (1996) determine that the employment of single women with children increased to roughly 75 percent (an increase of 2.8 percentage points) after the 1986 expansion of the EITC program. After the 1993 expansion of the EITC program, Eissa and Hoynes (1998) find modest negative effects of the EITC on married women's employment. Based on simulations, Keane and Moffit (1998) suggest that the 1984 and 1996 program expansions resulted in an 11-percentage-point increase in employment to 76 percent. Other studies (e.g., Meyer and Rosenbaum 2001; Holz and Scholz 2001; Hotz 2001; Wu 2002) also show that the EITC program generally encourages employment and increases the income for some of the nation's lowest income working families.

### ***Family Expenditures***

A few studies have documented how recipients used EITC refunds. For income tax refunds in general, Souleles (1999) finds that roughly 20 percent of this income was used to purchase durable goods over the 1979 to 1990 period. Based on a small ethnographic study, Romich and Weisner (1999) determine that families tend to use this refund to make large purchases and to improve the family's well being. Likewise, using the Consumer Expenditure Survey, Barrow and McGranahan (2000) find evidence to suggest that at least some of the EITC funds are channeled into spending on durable goods. Their estimates also indicate that income smoothing is being facilitated through these credit dollars. Smeeding et al. (2000) determine that families in Chicago had

expectations to use the EITC funds generally to improve their economic and social mobility and to help make ends meet. More recently, a study by Stegman et al. (2003) showed how EITC dollars might be used to mitigate the high cost of housing for low-income families.

### ***Household Asset Building***

Can the EITC be a useful vehicle for asset building and wealth creation? The answer to this question is somewhat mixed in the literature. There is an increasing number of studies showing that lower-income families have not only an interest in saving but also are willing to postpone current consumption to improve their longer-term financial position (e.g., Bird, Hagstrom and Wild 1999; Shapiro 1998; Oliver and Shapiro 1995; and Sherraden 1991). Other studies suggest that, despite an interest in saving, many lower-income families use the EITC funds to pay off outstanding debt, purchase durables, or meet other consumption needs. This response appears most frequently by householders who have more recently entered the workforce and/or households headed by single females (e.g., Smeeding 2000; Loprest 1999; Edin 1998; Edin and Lein 1997). While it may seem reasonable to promote the EITC credit as a means of encouraging asset building, it simply may not be a viable option for some EITC-eligible families. Even so, the potential gains in personal and social benefits from leveraging a portion of the EITC funds for asset-building purposes is worthy of further consideration.

Recipients financially able to look beyond basic consumption needs have a unique opportunity to use this relatively large lump-sum income for other purposes, such as housing and residential relocation, purchasing vehicles, making education and other human capital investments, and saving. The financial circumstances for EITC-eligible

families suggest that at least a portion of the funds likely will be used for consumption and purchases of durable goods. Our study seeks to better understand whether this policy can encourage asset accumulation through saving, albeit this is not altogether a new question. Smeeding et al. (2000) and Beverly et al. (2000) find that consumers expect to save at least a portion of their refund.

Research undertaken by Beverly et al. (2001) is particularly insightful for our study. Through a partnership created between ShoreBank (a community development financial institution) and the Center for Law and Human Services (a nonprofit organization), a program was offered to EITC-eligible taxpayers in the Chicago area. One of the principal aims of their extra credit savings program was to make low-cost savings accounts available to families receiving EITC funds. The funds in this account earned a market rate of interest plus a 10 percent bonus on funds remaining in the account at year end up to \$100. Although based on a relatively small sample, this is one of the few studies that document the bank status (banked or unbanked), consumption, and savings decisions of EITC recipients. Their findings suggest that programs linking tax refunds to bank accounts can facilitate account ownership, help integrate lower-income families into the financial mainstream, and promote asset building through saving.

#### **4. Data**

Our study analyzes the financial decisions made by EITC-eligible recipients using 2003 tax year data collected by FoodChange. FoodChange leveraged its extensive network of locations to establish VITA sites that provided free tax preparation services to lower-income taxpayers.<sup>17</sup> During the tax preparation process, information was collected

from taxpayers about their socioeconomic and demographic characteristics, bank status, and prior years' tax filings.

In partnership with FoodChange, several financial institutions in the metropolitan area made savings accounts available to taxpayers at the tax preparation sites.<sup>18</sup> This gave unbanked families the opportunity to open a deposit account and receive their refund more quickly through electronic deposit without having to pay additional fees for a rapid refund loan commonly charged by professional tax preparers.<sup>19</sup>

Table 1 describes the socioeconomic and demographic variables used in this study, while Table 2 provides the descriptive statistics for these attributes.<sup>20</sup> The total sample of 18,498 taxpayers is also separated between unbanked and banked EITC-eligible individuals to gain a better sense about their socioeconomic profile. Almost 40 percent (7,317 out of 18,498) of the participating taxpayers were without a checking or a savings account prior to the 2003 tax preparation process. The majority of the unbanked taxpayers had 12 years or less of education, were of working age, and had two or fewer dependents. Conversely, a higher proportion of banked taxpayers had at least some college, earned higher income, and received a greater tax refund than unbanked taxpayers. A larger proportion of unbanked families participate in the food stamp program, whereas a larger proportion of banked families had their previous year's taxes prepared by FoodChange. Table 2 also shows that almost 9 percent of the unbanked taxpayers opened a savings account at the tax preparation site. Interestingly, 3.6 percent of the banked taxpayers also took this opportunity to open a savings account.

A substantial amount of variation was identified for the family income measure reported by banked and unbanked groups. For the unbanked, average family income was

\$8,718, with a standard deviation of \$7,290, while the average for banked families was \$14,151, with a standard deviation of \$9,465. To better capture information about how these varying income distributions might affect outcomes, family income was defined in quartiles by bank status.

Ninety percent of the total sample received a positive refund for the 2003 tax year. The remaining respondents were roughly divided between receiving either a zero or a negative refund. Those receiving a zero refund were most frequently older taxpayers, taxpayers who worked part time, or taxpayers with no dependents, whereas respondents receiving a negative refund were more heavily represented by taxpayers earning lower income, filing back taxes, or having no dependents. The average total refund for unbanked taxpayers was \$1,105. The EITC is the source for two-thirds of this average total refund. Similarly, the average total refund for banked taxpayers is \$1,785, with the majority (55 percent) attributed to the EITC. Our analysis focuses on the total refund received because of the expectation that taxpayers base their expenditure and saving decisions on all dollars received from their tax return. The quartile distribution of total refund for each group will be analyzed to better determine whether the saving decision differs at higher refund amounts. Figure 3 shows a histogram of the quartile cutoffs for the total and EITC refunds received by unbanked and banked taxpayers, respectively.

Taxpayers were asked how they expected to use the majority of their refund. To observe how this decision differed by bank status, the total sample was separated between unbanked and banked taxpayers. Generally speaking, the responses reported in Table 3 suggest that the majority of refunds were expected to be used to repay debt or to meet immediate needs. Paying debt was the most frequent response and was insignificantly

different between unbanked and banked taxpayers. According to the tax preparers interviewed, the ‘Other’ categorical response was given primarily when taxpayers either said they were unsure about how the refund would be spent or said the refund would be spent in multiple categories fairly equally.<sup>21</sup>

Slightly more than 9 percent of the unbanked and 11.7 percent of the banked taxpayers said they would save the majority of their refund. Figure 2 provides additional insights about those who planned to save the majority of their refund. Ninety-four percent of these taxpayers received a positive refund. Fifteen percent of the unbanked who received a refund chose to open a savings account and 3 percent of the banked respondents opened a savings account.

While the data in this study provide a fairly rich description of the EITC-eligible taxpayers, two potential shortcomings require further discussion. Previous studies on the unbanked typically included a measure of the household’s net worth. This information was not collected at the VITA sites. Because this sample includes lower-income EITC-eligible taxpayers who are not homeowners, it is expected that this omission will likely have little impact on the analysis.<sup>22</sup> The second point concerns questions related to the taxpayers’ expectations about how they would spend the majority of their tax refund. It is possible that the refund was not used in the expected way. These points should be kept in mind when interpreting the results.

## **5. Empirical Investigation and Results**

Building from a consumer choice theoretical framework, we propose to model the consumer’s decision of whether to open a savings account or not with a binomial probit model,

$$\text{Probability}[\text{Open Savings Account} \mid \mathbf{x}] = \Phi(\beta' \mathbf{x})$$

where  $\Phi(t)$  denotes the CDF of the normal distribution and  $\mathbf{x}$  denotes those covariates that influence the choice.<sup>23</sup> The decision to open a savings account is influenced by an individual's socioeconomic and demographic covariates. The dependent variable,  $y_1 = \text{SAVACCT}$ , is equal to one if the individual opens a savings account and zero otherwise. An important consideration is the possibility that an individual's prior decision to be unbanked influences the current decision to open a savings account at the VITA site. Following Greene (1998), we employ a recursive bivariate probit model to evaluate the possible linkage between the pre-tax season decision to be unbanked and the decision to open a savings account at the VITA site.<sup>24</sup> The variable,  $y_2 = \text{UNBANKED}$ , is equal to one if the individual does *not* have a checking or a savings account before their 2003 taxes were prepared and equals zero otherwise. The probit specification is also used to model this second choice variable. The full model is

$$y_1^* = \beta' x_1 + \gamma y_2 + \epsilon_1, \quad y_1 = 1 \text{ if } y_1^* > 0, \quad 0 \text{ otherwise,} \quad (1)$$

$$y_2^* = \alpha' x_2 + \epsilon_2, \quad y_2 = 1 \text{ if } y_2^* > 0, \quad 0 \text{ otherwise,} \quad (2)$$

where the disturbances are jointly normally distributed with

$$E[\epsilon_1] = E[\epsilon_2] = 0,$$

$$\text{Var}[\epsilon_1] = \text{Var}[\epsilon_2] = 1,$$

$$\text{Corr}[\epsilon_1, \epsilon_2] = \rho,$$

and  $y_1$  and  $y_2$  denote SAVACCT and UNBANKED, respectively. The joint decision is described by the probability model,

$$\begin{aligned} \text{Prob } [y_1 = 1, y_2 = 1] &= \text{Prob } [y_1 = 1 | y_2 = 1] \times \text{Prob } [y_2 = 1] \\ &= \{ \text{BVN}(y_1=1, y_2=1) / \text{Prob}[y_2=1] \} \times \text{Prob}[y_2=1], \end{aligned} \quad (3)$$

where BVN denotes the CDF of the bivariate normal distribution. If we insert the variables of our model and include the two parameter vectors, the preceding can be rewritten as

$$\text{Prob } [y_1 = 1, y_2 = 1] = [\text{BVN}(\beta' x_1 + \gamma, \alpha' x_2, \rho) / \Phi(\alpha' x_2)] \times \Phi(\alpha' x_2). \quad (4)$$

After canceling terms, this produces the bivariate probability

$$\text{Prob}[y_1=1, y_2=1] = \text{BVN}(\beta' x_1 + \gamma, \alpha' x_2, \rho)$$

where  $\beta$ ,  $\gamma$ ,  $\alpha'$ , and  $\rho$  are the parameters to be estimated. The three remaining cases are

$$\text{Prob } [y_1 = 1, y_2 = 0] = \text{BVN}(\beta' x_1, -\alpha' x_2, -\rho),$$

$$\text{Prob } [y_1 = 0, y_2 = 1] = \text{BVN}(-\beta' x_1 - \gamma, \alpha' x_2, -\rho), \text{ and}$$

$$\text{Prob } [y_1 = 0, y_2 = 0] = \text{BVN}(-\beta' x_1 - \gamma, -\alpha' x_2, \rho)$$

Despite initial appearances, these terms enter the usual likelihood function for the bivariate probit model in all four cases. Contrary to what intuition might suggest, the presence of  $y_2$  in the first equation does not cause a “simultaneity” problem. The model can be consistently and efficiently estimated as a bivariate probit model, as stated, by maximum likelihood as if there were no joint determination in the first equation.<sup>25</sup>

The bivariate probit model is estimated to ascertain whether the probability of opening a savings account (SAVACCT) while at the VITA site is jointly determined with being unbanked (UNBANKED) prior to going to the VITA site.<sup>26</sup> This model includes a correlation between the latent (unobserved) effects in the SAVACCT and UNBANKED equations. If this correlation coefficient,  $\rho$ , is measured as statistically different from zero, we conclude that opening a savings account not only is directly affected by the

decision to be unbanked but also is indirectly influenced through household effects (such as unmeasured preference effects), which are not explicit in the model. If the correlation coefficient,  $\rho$ , is insignificantly different from zero, we conclude that latent effects are not detected. We do note that our specification is an extension of the standard model in that, even if  $\rho$  equals zero, the two consumer decisions would not be viewed as independent—UNBANKED appears explicitly in the SAVACCT equation.

### ***Unbanked Equation Specification***

Research suggests that the decision to be unbanked is more likely for respondents that have less education (EDUC6-9, EDUC10-12), are relatively young (AGE18-24) or possibly in the early to midpoint of their work life (AGE25-45), or are members of a minority group (BLACK, HISPANIC, ASIAN, OTHER\_RACE). On the other hand, as family income (INCOME) rises, it is expected that a respondent is less likely to be unbanked. It has also been suggested that family size also influences the likelihood to be unbanked, albeit the direction of impact is uncertain. It might be expected that larger families may have a greater number or more complex set of financial transactions to complete and therefore may be less likely to be unbanked. Conversely, the additional stress of a larger family on the household budget may result in the family's decision to forgo a deposit account. How family size, proxied by number of dependents (DEPENDENTS), influences the likelihood to be unbanked is determined in the empirical investigation. It also might be expected that taxpayers who receive means-tested benefits may be concerned about holding a deposit account, fearing a loss of certain benefits. If this is the case, food stamp recipients (FOODSTAMPS) may be more likely to be unbanked than those who do not participate in this program.

This study considers how the relationship with the sponsoring nonprofit organization may influence the likelihood to be unbanked. During the previous two tax years, FoodChange partnered with several financial institutions to offer taxpayers a savings account. Returning clients who opened a savings account in a previous tax year would be less likely to be unbanked in the 2003 tax year. An indicator variable, RELATIONSHIP, is included to determine if taxpayers who have a recurring relationship with FoodChange are less likely to be unbanked than those who had no prior relationship with this organization.

### ***Savings Account Equation Specification***

In part, the decision to open a savings account is expected to mirror the behavior underlying the unbanked decision. In particular, opening a savings account is expected to be less likely for respondents who have less education (EDUC6-9, EDUC10-12), receive food stamps (FOODSTAMPS), or are a member of a minority group (BLACK, HISPANIC, ASIAN, OTHER\_RACE). On the other hand, having higher income (INCQ3, INCQ4), a greater number of dependents (DEPEND1, DEPEND2, or DEPEND3+), or a larger refund (REFUNDQ2, REFUNDQ3, REFUNDQ4) is expected to positively influence the decision to open a savings account. It also might be expected that working-age taxpayers (AGE18-24, AGE25-45, or AGE46-65) are more likely to open a savings account than those who are at retirement age (AGE65+). As such, a positive relationship is expected between these age groups and opening an account. Whether a taxpayer who has a recurring relationship with FoodChange (RELATIONSHIP) is more or less likely to open a savings account during the 2003 tax season is uncertain. Returning clients who previously opened a savings account may have

no need to open an account during the 2003 tax season. If so, having a previous relationship will likely have a negative or possibly insignificant influence on opening an account. Alternatively, returning clients who previously had not opened an account may be more inclined to open an account this tax season because of the established relationship with FoodChange. How this relationship influences the likelihood of opening a savings account will be determined from the empirical investigation. Finally, those who are unbanked (UNBANKED) are expected to be more likely to open a savings account than those who already possess a deposit account.

### ***Results***

The estimated bivariate probit model is reported in Table 4 and represents the case where SAVACCT is equal to one and UNBANKED is equal to one.<sup>27</sup> The UNBANKED equation shows that being younger or in the relatively early work-life stage; having less education; being black, Hispanic, or “Other” race; or participating in the food stamp program positively influences the decision to be unbanked. Conversely, being Asian, earning higher income, having a greater number of dependents, or having a relationship with FoodChange negatively influences the decision to be unbanked.

The SAVACCT equation shows that being unbanked, receiving a positive refund, and having a relationship with FoodChange significantly increases the likelihood that a savings account is opened. Taxpayers who are of working age or are in the “Other” race category also are more likely to open a savings account. Finally, the insignificance of  $\rho$ , the correlation coefficient, suggests that no latent effects are detected.<sup>28</sup>

Marginal effects are computed from the estimates shown in Table 4 to determine the magnitude and direction of influence that the socioeconomic and demographic

characteristics have on the probability that unbanked consumers open a savings account. A description of the marginal effects, decomposed into direct and indirect components, on the probability of opening an account when unbanked is equal to one is provided in Appendix 3. The variables on the right-hand side of the SAVACCT equation are all binary. Accordingly, the marginal effects are computed by evaluating the conditional probability with these binary covariates set equal to one then set equal to zero and taking the difference, with other variables fixed at the sample means.<sup>29</sup>

As shown in Table 5, unbanked taxpayers between the ages of 18 and 24 are 6.3 percentage points more likely to open a savings account than taxpayers who are 66 years of age or older. Similarly, unbanked taxpayers between the ages of 25 and 45 are 3.8 percentage points more likely to open an account, while those aged 46 to 65 are 2.7 percentage points more likely to open an account than unbanked taxpayers who are of retirement age. Although being a member of a minority group has a significant influence on the decision to be unbanked (Table 4), our findings suggest that, with the exception of persons in the Other racial/ethnic category, being a minority (relative to being white) has no significant influence on the likelihood that an unbanked taxpayer opens a savings account. Unbanked taxpayers in the Other race group, however, are 2.3 percentage points more likely to open a savings account than unbanked whites.

Unbanked taxpayers with a positive refund in the second quartile are 0.8 percentage point more likely to open an account than taxpayers who received a lower refund (refund in the first quartile, a zero refund, or owed taxes). Similarly, taxpayers with a refund in the third quartile are 0.9 percentage point more likely to open an account, while taxpayers who receive a refund in the fourth quartile are 1.7 percentage points

more likely to open an account. While not overly large, these findings support the proposition that receiving a positive refund does influence the savings account decision. The magnitude of the refund marginal effects also is somewhat larger at higher quartiles.<sup>30</sup>

Unbanked taxpayers with a recurring relationship with FoodChange are 1.2 percentage points more likely to open an account, suggesting that VITA sites sponsored by nonprofit organizations can play an important role in helping to move lower-income consumers into the financial mainstream and potentially facilitating asset-building behavior. Finally, the number of dependents, receiving food stamps, having a lower level of education, or earning higher income does not significantly influence the likelihood to open a savings account.

## **6. Future Research**

This study contributes to the growing body of literature about programs that encourage participation in the financial mainstream. One question that cannot be answered from this study is whether these accounts will be kept over time. Additional research is needed to determine whether the accounts opened using a tax refund are a viable way for lower-income working families to participate in the financial mainstream, build assets, and accumulate wealth.

In response to this need, the authors have initiated a study for the 2004 tax year that will extend the scope of the 2003 tax year study in several ways. First, the family's bank status and saving decisions will be tracked over time; second, a more detailed analysis will be made concerning the unbanked individual's decision to remain

unbanked; third, further investigation into the various ways lower-income individuals prefer to save will be compared to a control group; and finally, a relatively large sample will be employed to allow for greater depth in the empirical investigation. The results from this study are expected to better inform policy about whether or not the EITC program can help promote mainstream financial market participation and asset-building behavior by lower-income families. Several unique features included in the 2004 study are briefly discussed below.

#### ***Follow-Up Survey Data Collection***

A follow-up survey will be conducted seven to nine months after the completion of the taxpayer's 2004 tax return through randomized telephone interviews. The primary goals of the follow-up survey are to determine: (1) how the refunds were actually used; (2) if new savings accounts opened during the tax season remained open and whether or not the taxpayer expects to retain this account; (3) if the savings account has been closed or is expected to be closed before the end of 2005, what is the primary reason for closing the account; (4) why a taxpayer chooses to remain unbanked with an emphasis on whether or not the potential loss of means-tested benefits influenced this decision; and (5) the various ways these lower-income taxpayers prefer to save.

#### ***Control Survey Data Collection***

A potential drawback from analyzing consumer behavior based on a program-specific experience is that the analysis does not include a natural set of benchmark behaviors from which to make comparisons. To address this issue, a random survey will be undertaken to collect comparable information (questions asked at the VITA site as

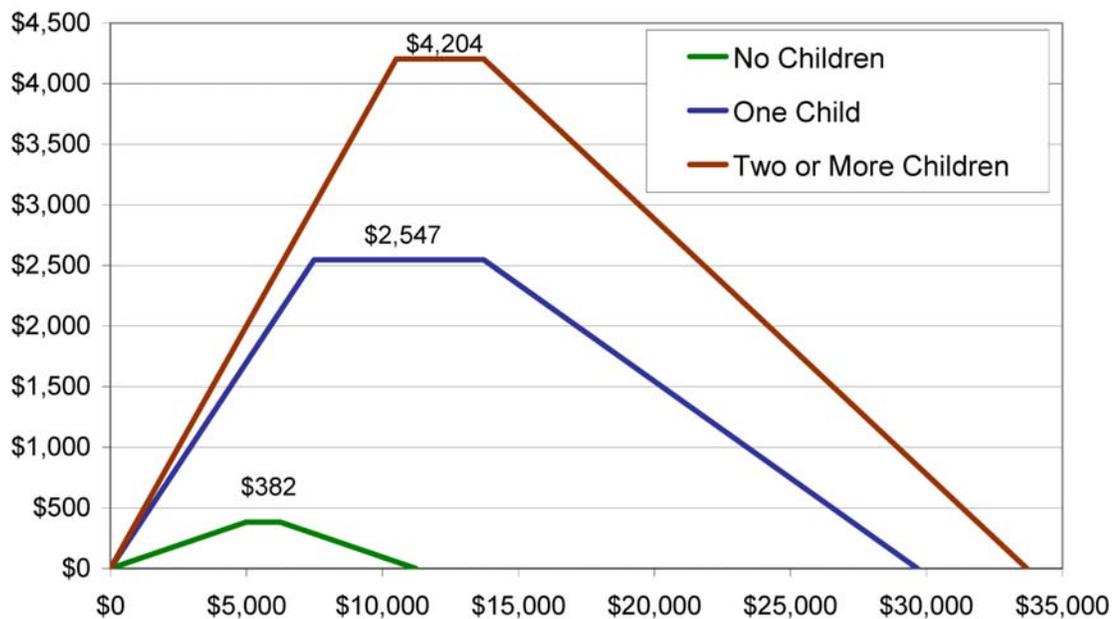
well as the follow-up survey questions) from EITC-eligible taxpayers with similar characteristics but who did not participate at the FoodChange VITA sites.

### ***Implement Changes Based on the 2003 Tax Year Experience***

Tax preparation at the VITA sites is a fairly time-intensive process for taxpayers. For the 2004 tax season, this process has been streamlined to provide greater efficiencies in preparing the tax forms, collecting the baseline socioeconomic, demographic, tax filing and bank status questions, and opening a savings account (see Figures 4a and 4b).

Based on the 2003 experience, some baseline questions will be modified to provide greater insights into the consumer's decision-making process. For example, the question related to how the taxpayer expects to use his/her tax refund will have additional response categories that allow the respondent to choose "I don't know" and "Spending for multiple needs." Similarly, additional response categories for why they decided not to open a savings account will be added.

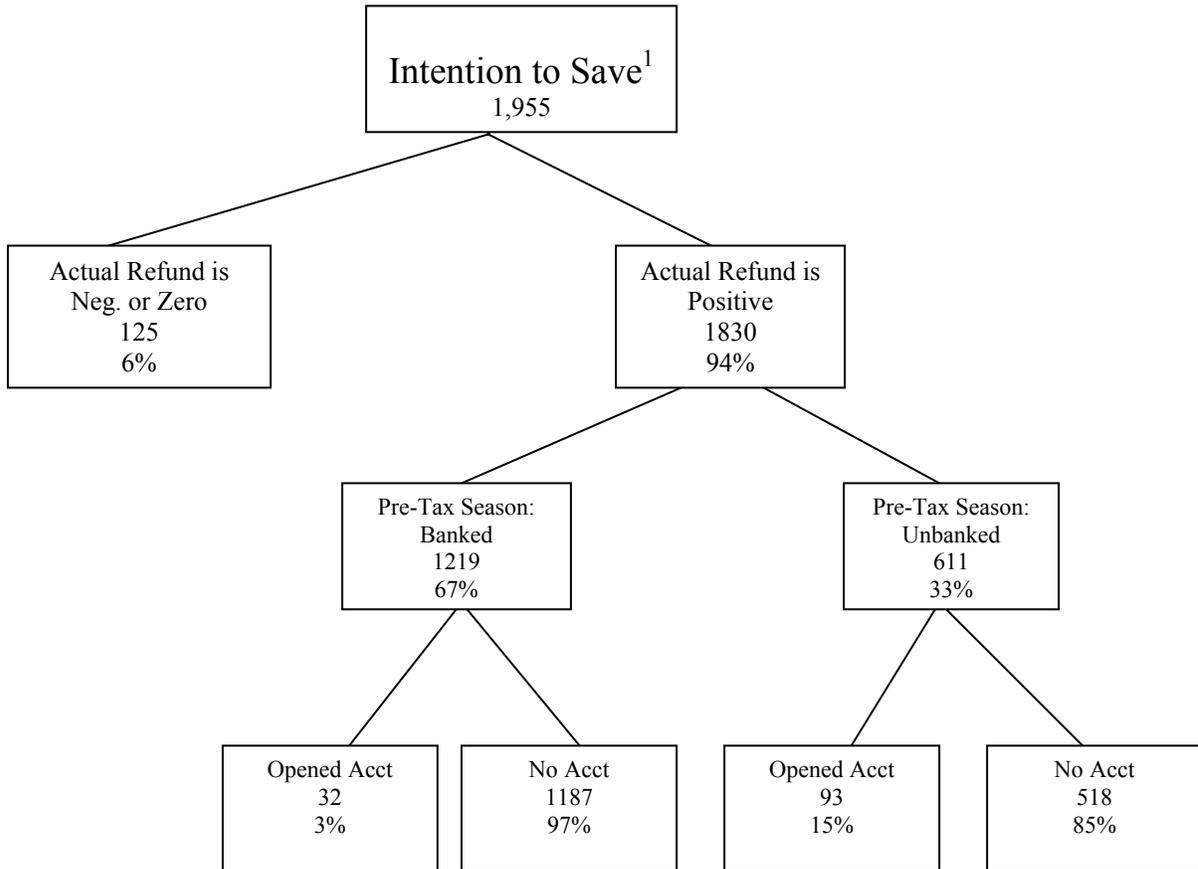
Figure 1. Structure of the Earned Income Tax Credit in Tax Year 2003, Head of Household Filers\*



Source: Internal Revenue Service

\* Married couples filing jointly are eligible for slightly higher credit amounts in the "phase-out" range of the EITC.

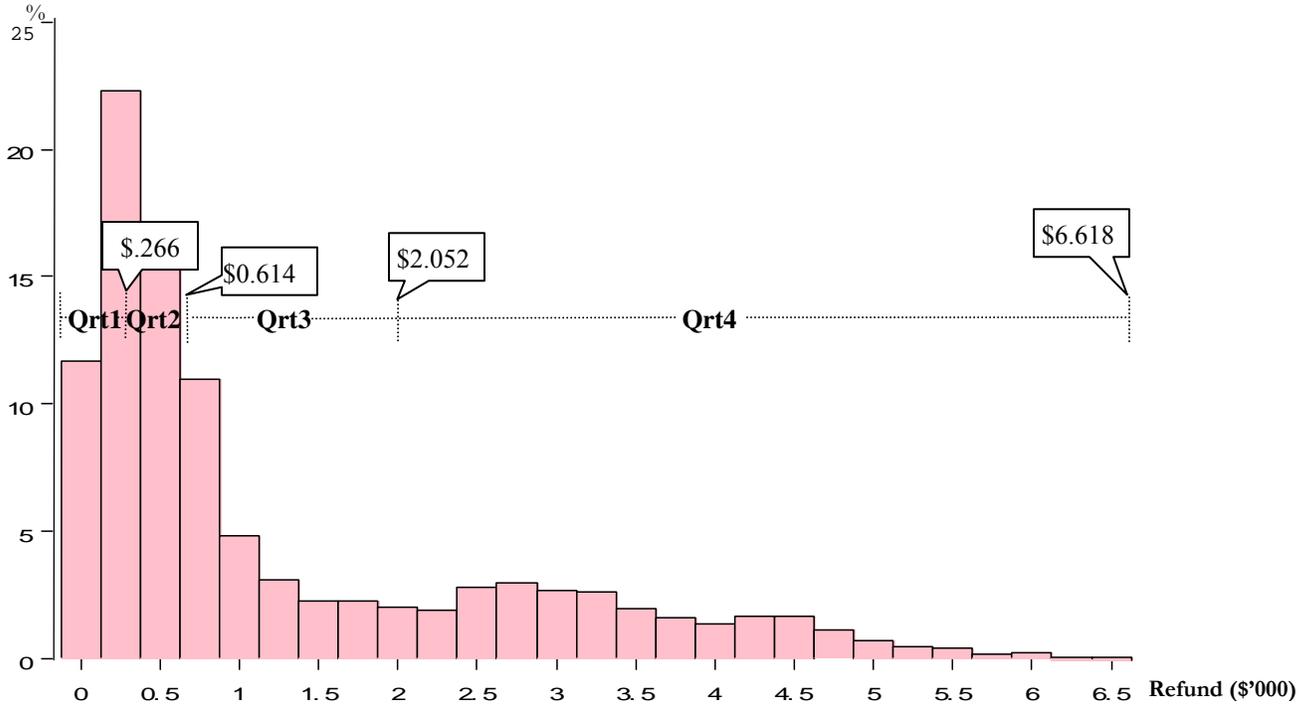
**Figure 2: Respondents with an Intention to Save a Majority of Their Refund  
and Their Savings Account Decision at the Tax Site**



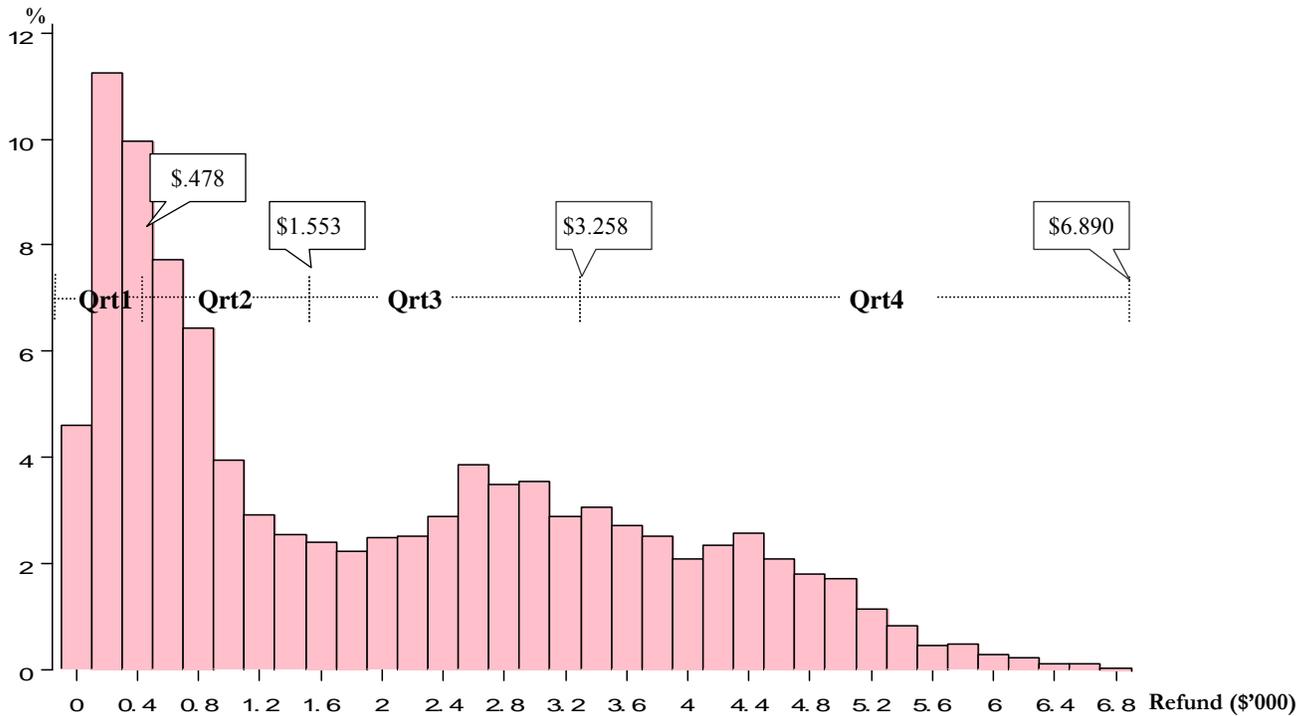
<sup>1</sup>Taxpayers with an intention to save a majority of their refund represent 10.7 percent of the total sample (1,955 of 18,329).

**Figure 3: Histograms of Total Positive Refund and EITC(“\$000)**

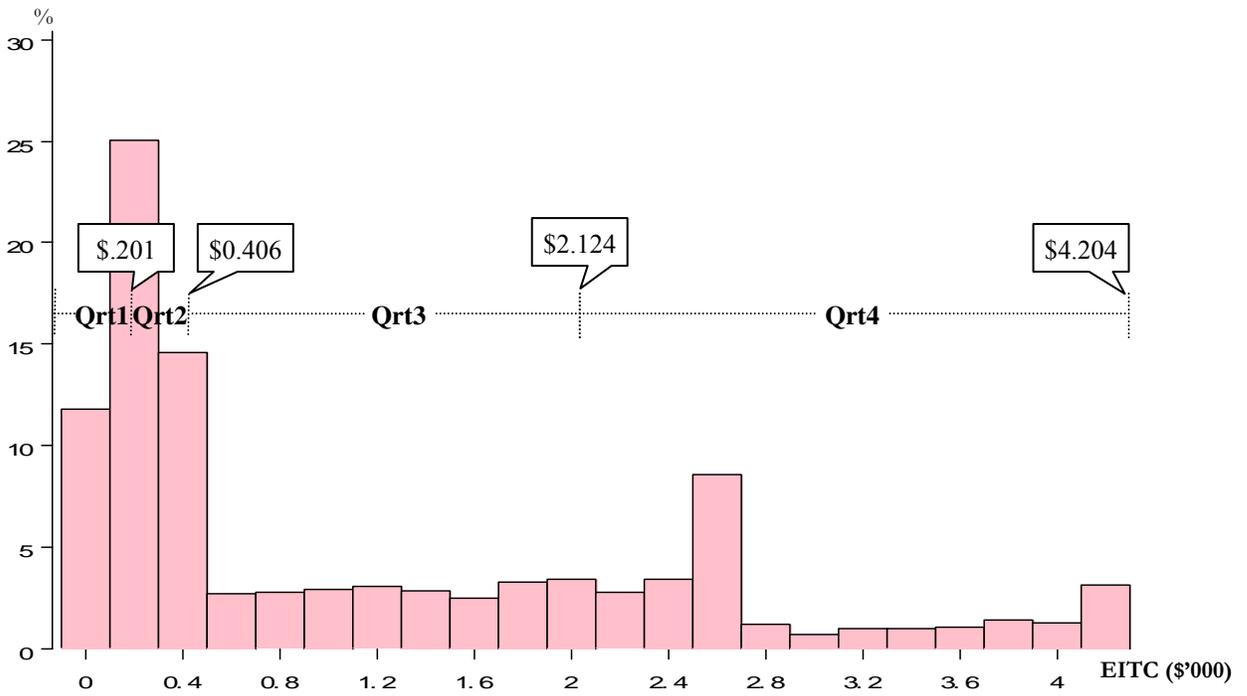
*Figure 3a: Refund Quartiles for Unbanked*



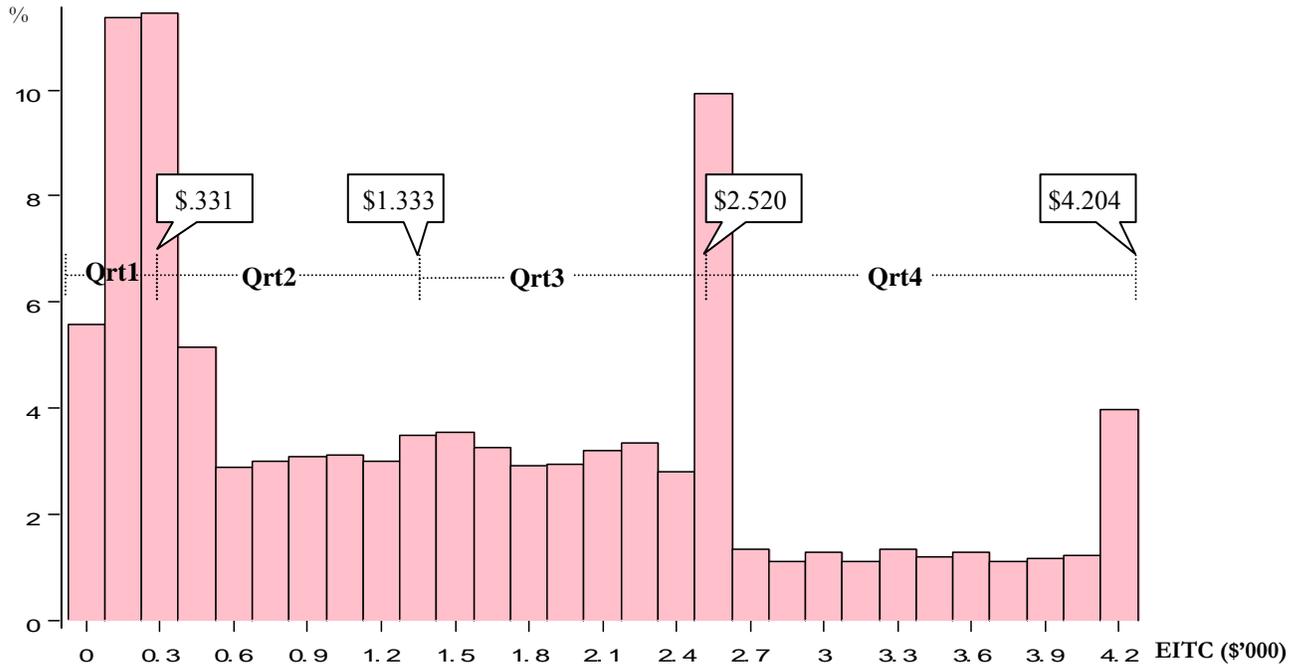
*Figure 3b: Refund Quartiles for Banked*



**Figure 3c: EITC Quartiles for Unbanked**

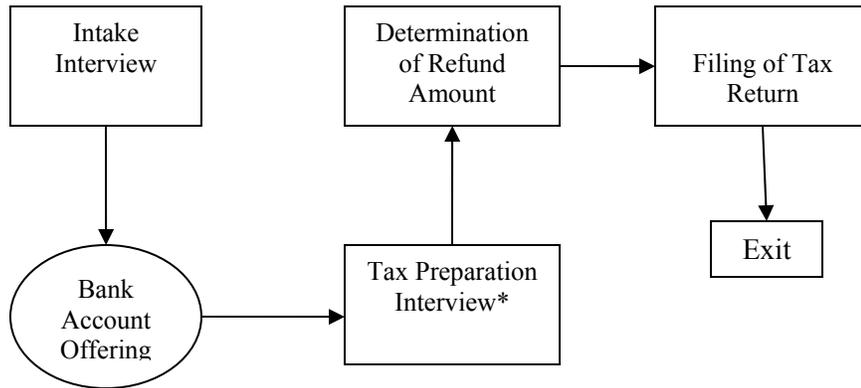


**Figure 3c: EITC Quartiles for Banked**



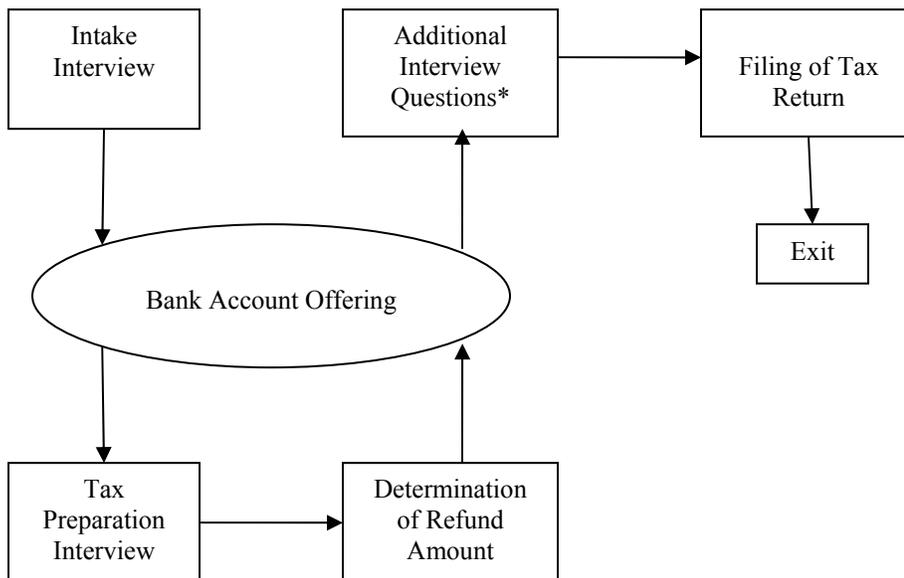
**Figure 4: FoodChange Tax Preparation Process**

**Figure 4a: 2003 Tax Season**



\*Includes questions related to refund allocation plans.

**Figure 4b: 2004 Tax Season**



\*Includes questions related to refund allocation plans.

**Table 1. Definition of Variables**

<b>Variable</b>	<b>Definition</b>
<b><i>Education</i></b>	
EDUC6-9	Equal to 1 if taxpayer's highest level of education is between 6 and 9 grade; 0 otherwise
EDUC10-12	Equal to 1 if taxpayer's highest level of education is between 10 and 12 grade; 0 otherwise
TRADE SCHOOL	Equal to 1 if taxpayer's highest level of education is trade school; 0 otherwise
SOME COLLEGE	Equal to 1 if taxpayer's highest level of education is some college; 0 otherwise
COLLEGE GRADUATE	Equal to 1 if taxpayer's highest level of education is completed college; 0 otherwise
OTHER	Equal to 1 if taxpayer's highest level of education is reported as other; 0 otherwise
<b><i>Racial/Ethnic Group</i></b>	
WHITE	Equal to 1 if taxpayer is white; 0 otherwise
BLACK	Equal to 1 if taxpayer is black; 0 otherwise
HISPANIC	Equal to 1 if taxpayer is Hispanic; 0 otherwise
ASIAN	Equal to 1 if taxpayer is Asian; 0 otherwise
OTHER_RACE	Equal to 1 if taxpayer is Native American or other not listed above; 0 otherwise
<b><i>Age Distribution</i></b>	
AGE18-24	Equal to 1 if taxpayer is between 18 and 24 years old; 0 otherwise
AGE25-45	Equal to 1 if taxpayer is between 25 and 45 years old; 0 otherwise
AGE46-65	Equal to 1 if taxpayer is between 45 and 65 years old; 0 otherwise
AGE65+	Equal to 1 if taxpayer is older than 65 years old; 0 otherwise
<b><i>Dependents</i></b>	
DEPENDENTS	Taxpayer's number of dependents for tax purposes
DEPEND0	Equal to 1 if taxpayer claimed no dependents; 0 otherwise
DEPEND1	Equal to 1 if taxpayer claimed only 1 dependent; 0 otherwise
DEPEND2	Equal to 1 if taxpayer claimed 2 dependents; 0 otherwise
DEPEND3+	Equal to 1 if taxpayer claimed 3 or more dependents; 0 otherwise
<b><i>Family Income</i></b>	
INCOME	Total taxpayer family income (US\$ '000)
INCOMEZERO	Equal to 1 if taxpayer family income is zero; 0 otherwise
INCQ1	Equal to 1 if taxpayer family income is in the 1st quartile; 0 otherwise
INCQ2	Equal to 1 if taxpayer family income is in the 2nd quartile; 0 otherwise
INCQ3	Equal to 1 if taxpayer family income is in the 3 <sup>rd</sup> quartile; 0 otherwise
INCQ4	Equal to 1 if taxpayer family income is in the 4 <sup>th</sup> quartile; 0 otherwise

**Table 1 continued**

<b>Variable</b>	<b>Definition</b>
<b><i>Tax Refund</i></b>	
REFUNDNEG	Equal to 1 if 2003 tax refund was negative (owed IRS); 0 otherwise
REFUNDZERO	Equal to 1 if 2003 tax refund was zero; 0 otherwise
REFUNDQ1	Equal to 1 if 2003 tax refund is in 1 <sup>st</sup> quartile; 0 otherwise
REFUNDQ2	Equal to 1 if 2003 tax refund is in 2 <sup>nd</sup> quartile; 0 otherwise
REFUNDQ3	Equal to 1 if 2003 tax refund is in 3 <sup>rd</sup> quartile; 0 otherwise
REFUNDQ4	Equal to 1 if 2003 tax refund is in 4 <sup>th</sup> quartile; 0 otherwise
<b><i>Bank Status</i></b>	
BANKED	Equal to 1 if taxpayer had a deposit account prior to 2003 tax preparation; 0 otherwise
UNBANKED	Equal to 1 if taxpayer did not have a deposit account prior to 2003 tax preparation; 0 otherwise
SAVEACCT	Equal to 1 if taxpayer opened a savings account at the 2003 tax preparation site; 0 otherwise
<b><i>Food Stamps</i></b>	
FOODSTAMP	Equal to 1 if taxpayer is a food stamp beneficiary; 0 otherwise
<b><i>Nonprofit Relationship</i></b>	
RELATIONSHIP	Equal to 1 if FoodChange prepared taxpayer's previous years' taxes; 0 otherwise

**Table 2. Descriptive Statistics**

<b>Variable</b>	<b>Unbanked</b>	<b>Banked</b>	<b>Total Sample</b>
<b><i>Education</i></b>			
EDUC6-9	.109	.079	.091
EDUC10-12	.596	.464	.516
TRADE SCHOOL	.045	.044	.044
SOME COLLEGE	.168	.254	.220
COLLEGE GRADUATE	.069	.146	.115
OTHER	.013	.014	.013
<b><i>Racial/Ethnic Group</i></b>			
WHITE	.036	.050	.045
BLACK	.445	.467	.458
HISPANIC	.445	.385	.409
ASIAN	.012	.041	.030
OTHER_RACE	.062	.056	.058
<b><i>Age Distribution</i></b>			
AGE18-24	.206	.154	.175
AGE25-45	.517	.548	.536
AGE46-65	.248	.256	.253
AGE65+	.030	.041	.037
<b><i>Dependents</i></b>			
DEPENDENTS (divided by 10)	.068	.098	.086
DEPEND0	.576	.396	.467
DEPEND1	.239	.325	.291
DEPEND2	.133	.207	.178
DEPEND3+	.051	.072	.064
<b><i>Family Income</i></b>			
INCOME (US\$ '000)	8.718	14.151	12.002
INCOMEZERO	.025	.016	.020
INCQ1	.244	.246	.245
INCQ2	.244	.246	.245
INCQ3	.244	.246	.245
INCQ4	.244	.246	.245

**Table 2. continued**

<b>Variable</b>	<b>Unbanked</b>	<b>Banked</b>	<b>Total Sample</b>
<b><i>Tax Refund</i></b>			
REFUND (US\$ '000)	1.105	1.785	1.516
REFUNDZERO	.050	.040	.044
REFUNDNEG	.057	.045	.050
REFUNDQ1	.223	.229	.227
REFUNDQ2	.223	.228	.226
REFUNDQ3	.223	.229	.227
REFUNDQ4	.223	.229	.226
<b><i>Bank Status</i></b>			
BANKED	.000	1.000	.604
UNBANKED	1.000	.000	.396
SAVEACCT	.089	.036	.057
<b><i>Food Stamps</i></b>			
FOODSTAMP	.122	.076	.094
<b><i>Nonprofit Relationship</i></b>			
RELATIONSHIP	.195	.244	.224
Sample Size	7317	11181	18498

**Table 3. Expected Use of Refund by Bank Status <sup>1</sup>**

<b>Variable</b>	<b>Unbanked</b>	<b>Banked</b>	<b>Total Sample</b>
Debt	.247	.250	.249
Other	.239	.229	.233
Bills	.185	.210	.200
Rent	.164	.127	.142
Savings	.091	.117	.107
Family	.057	.046	.050
Home	.017	.022	.020
Sample Size	7267	11062	18329

<sup>1</sup>Excludes taxpayers that did not answer the question.

**Table 4**  
**Bivariate Probit Model**

Variables	Coefficients (Std. Error)
<b>Equation for Savings =1</b>	
CONSTANT	-2.303*** (.149)
EDUC6-9	-.039 (.068)
EDUC10-12	-.048 (.047)
AGE18-24	.528*** (.123)
AGE25-45	.436*** (.122)
AGE46-65	.275** (.122)
BLACK	-.102 (.078)
HISPANIC	-.101 (.080)
ASIAN	-.214 (.142)
OTHER_RACE	.200** (.093)
INCQ3	-.031 (.048)
INCQ4	-.097 (.076)
DEPEND1	.063 (.048)
DEPEND2	.109 (.059)
DEPEND3+	.066 (.081)

**Table 4 continued**

<b>Variables</b>	<b>Coefficients (Std. Error)</b>
FOODSTAMP	.048 (.053)
RELATIONSHIP	.135*** (.040)
REFUNDQ2	.087** (.044)
REFUNDQ3	.103*** (.053)
REFUNDQ4	.181*** (.064)
PR(UNBANKED)	.625*** (.232)

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<b>Equation for Unbanked</b>	
CONSTANT	-.255*** (.053)
EDUC6-9	.344*** (.036)
EDUC10-12	.360*** (.021)
AGE18-24	.087*** (.030)
AGE25-45	.110*** (.023)
BLACK	.175*** (.049)
HISPANIC	.286*** (.049)
ASIAN	-.514*** (.078)
OTHER_RACE	.289*** (.063)
INCOME	-.042*** (.001)

**Table 4 continued**

<b>Variables</b>	<b>Coefficients (Std. Error)</b>
DEPENDENTS	-410*** (.114)
FOODSTAMP	.121*** (.033)
RELATIONSHIP	-.058** (.024)
$\rho(1,2)$	-.098 (.150)
Log Likelihood	-15136.61
Sample Size	18498

\*\*\* = significant at 1% level

\*\* = significant at 5% level

**Table 5**  
**Marginal Effects**  
**The Likelihood of Opening a Savings Account**  
**for Unbanked Taxpayers**

Variables	Marginal Effect
EDUC6-9	-.001
EDUC10-12	-.002
AGE18-24	.063***
AGE25-45	.038***
AGE46-65	.027**
BLACK	-.008
HISPANIC	-.007
ASIAN	-.018
OTHER_RACE	.023**
INCQ3	-.003
INCQ4	-.008
DEPEND1	.006
DEPEND2	.010
DEPEND3+	.006
FOODSTAMP	.005
RELATIONSHIP	.012***
REFUNDQ2	.008**
REFUNDQ3	.009**
REFUNDQ4	.017***
Sample Size	18498

\*\*\* = significant at 1% level  
\*\* = significant at 5% level

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## **Appendix 1**

### **FoodChange**

FoodChange, Inc. is an advocacy and direct service nonprofit organization. It was founded in 1980 with the goal of improving access to nutritious food for all New Yorkers, especially the 2 million residents living below poverty. In 1999, FoodChange began providing free tax preparation services to its lower-income clients. This program has grown substantially over the last four years. By 2002, FoodChange had completed roughly 9,000 tax returns for that season across New York City. The total EITC dollars earned by FoodChange's clients was close to \$10 million, with an average taxpayer receiving a \$1,766 EITC refund.

For the 2003 tax season, FoodChange opened 10 free tax preparation sites called "Money Central" in the Bronx, Brooklyn, Manhattan, and Queens. At these sites individuals received free tax filing assistance and were helped with obtaining the earned income tax credit (EITC) and other credits (e.g., child care) for which they were eligible. In addition, FoodChange provided assistance with opening savings accounts, getting direct deposit of refunds, and gaining access to the food stamp and health insurance programs. The following eight financial institutions were present at these sites to open savings accounts for interested taxpayers: Amalgamated Bank, Bethex Federal Credit Union, Carver Federal Savings Bank, Fleet National Bank, GreenPoint Bank, Homesteaders Federal Credit Union, Independence Community Bank, and Neighborhood Trust Federal Credit Union

**Appendix 2**  
**FoodChange**  
**2003 Tax Preparation Locations in New York City**

**Bronx**

- 1199 Service Employees International Union Training Center  
2514 Creston Avenue
- 337 East 149<sup>th</sup> Street (South Bronx)

**Brooklyn**

- Carver Federal Savings Bank  
1281 Fulton Street
- Independence Community Bank  
138 Court Street
- Sunset Park: Lutheran Medical Family Support Center  
6025 Sixth Avenue

**Manhattan**

- FoodChange Food & Finance Center  
284 St. Nicholas Avenue
- 1199 Service Employees International Union NBF  
330 West 42<sup>nd</sup> Street, 9<sup>th</sup> Floor
- Washington Heights: Northern Manhattan Improvement Corp.  
76 Wadsworth Avenue – 2<sup>nd</sup> Floor

**Queens**

- 94-16 Roosevelt Avenue – 2<sup>nd</sup> Floor
- First Presbyterian Church  
89-60 164<sup>th</sup> Street

**Appendix 3**  
**Discussion of the Direct and Indirect Effects**  
**Bivariate Probit Model**

**Case: Prob[SAVACCT=1|UNBANKED=1]**

This discussion concerns one of the four cases highlighted in Section 5: Empirical Investigation and Results. The conditional probability,

$$\text{Prob}[\text{SAVACCT}=1|\text{UNBANKED}=1],$$

includes both a direct and an indirect effect. From the model structure in (4), the probability is

$$\begin{aligned} \text{Prob}[\text{SAVACCT}=1|\text{UNBANKED}=1] &= \text{Prob} [y_1 = 1 | y_2 = 1] \\ &= \text{Prob} [y_1 = 1, y_2 = 1] / \text{Prob}[y_2 = 1]. \end{aligned}$$

A variable of interest can appear in both probabilities. The direct and indirect effects can be seen by assuming that the variable is continuous and differentiating the probability. Denoting the influence by  $z$ , we have

$$\begin{aligned} &\frac{\partial \text{Prob} (y_1 = 1, y_2 = 1) / \partial z}{\text{Prob} (y_2 = 1)} + \frac{- \text{Prob} (y_1 = 1, y_2 = 1) (\partial \text{Prob} (y_2 = 1) / \partial z)}{[\text{Prob} (y_2 = 1)]^2} \\ &= \text{direct effect} + \text{indirect effect}. \end{aligned}$$

An attribute's total marginal effect in the savings account model is the sum of its direct and indirect effects. The direct effect is produced by the attribute's presence in the first equation, SAVACCT. The indirect effect is also produced if this same attribute is included in the second equation, UNBANKED. Accordingly, the total marginal effect on SAVACCT is the sum of the direct and indirect effects for those attributes that are specified in both equations. Attributes that are included in the second equation directly influence the probability of being unbanked. This effect is transmitted back to the first equation both through the attributes appearance in the second equation and through UNBANKED, which appears in the SAVACCT equation, thus exerting the secondary, or indirect, effect.

## Endnotes

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<sup>1</sup> See Nicholas Johnson et al, 2003.

<sup>2</sup> See Adam Carasso and C. Eugene Steuerle, July 19, 2004 and Daniel P. Gitterman and Christopher Howard, August 2003.

<sup>3</sup> See Council of Economic Advisors, 1998 and United States General Accounting Office, 2004.

<sup>4</sup> See Shefrin and Thaler, 1992 and Thaler, 1990.

<sup>5</sup> See Robert Doar, Commissioner of the Office of Temporary and Disability Assistance, State of New York, “New York State EITC/VITA Project,” presentation given at the American Public Human Services Association conference, 2004. A major goal for the state of New York is to reach the projected 25 percent of eligible EITC families not claiming EITC. Outreach efforts include mailings to the State’s Temporary and Disability Assistance clients and distribution of informational posters.

<sup>6</sup> This tax legislation underwent expansions in 1986, 1990, 1993, and 2001.

<sup>7</sup> DeNavas-Walt et al., “Income, Poverty, and Health Insurance Coverage in the United States: 2003,” U.S. Census Bureau, August 2004.

<sup>8</sup> United States Internal Revenue Service 2002.

<sup>9</sup> See Richard S. Toikka, 2001.

<sup>10</sup> See Robert Doar, Commissioner of the Office of Temporary and Disability Assistance, State of New York, “New York State EITC/VITA Project,” presentation given at the American Public Human Services Association conference, 2004.

<sup>11</sup> This example is taken from the presentation, “New York State EITC/VITA Project,” given by Robert Doar, Commissioner of the Office of Temporary and Disability Assistance, State of New York, 2004. According to the U.S. Census Bureau, the 2004 poverty threshold for a family of two adults and one child is \$15,205 and \$15,219 for a family with one adult and two children.

<sup>12</sup> See Anne Kim and Alan Berube, 2003.

<sup>13</sup> See Alan Berube, 2003.

<sup>14</sup> For example, see Rhine, Greene, and Toussaint-Comeau, 2005; Hogarth and O’Donnell, 1999; and Caskey 1997.

<sup>15</sup> For information concerning eligibility for means-tested benefits for residents of New York City, see [www.wceca.org](http://www.wceca.org).

<sup>16</sup> Alternatively, the taxpayer can opt to receive an advance EITC where the credit is paid monthly through paycheck disbursements. This option is available only to those taxpayers who have a qualifying child, earned income within specific boundaries, and wages that are subjected to federal income tax, social security tax or Medicare tax withholdings. Those taxpayers that expect to change marital status, have variable earnings or reside in a dual wage earner household may find this election disadvantageous. (see [www.cssny.org/consumerbenefits/eitc.pdf](http://www.cssny.org/consumerbenefits/eitc.pdf))

<sup>17</sup> See Appendix 2 for a listing of FoodChange’s 2003 tax preparation locations in New York City.

<sup>18</sup> See Appendix 1 for a description about FoodChange and its partnership with financial institutions for the 2003 tax year.

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<sup>19</sup> See Anne Kim and Alan Berube, 2003.

<sup>20</sup> The results of t-tests find that significant differences exist between unbanked and banked taxpayers at least at the 5 percent level for all attributes listed in Table 2 with the exception of the proportion of taxpayers who completed trade school, 'Other' education, were in the 'Other' race category (OTHER\_RACE), or were in the AGE46-65 category.

<sup>21</sup> For the 2004 tax year, this question has been modified to include 'I don't know' and 'Spending for multiple needs' response categories.

<sup>22</sup> Due to the complexity of filing returns with mortgage deductions, FoodChange did not provide tax preparation services to homeowners.

<sup>23</sup> See Greene, 2003 (Chapter 21).

<sup>24</sup> Because both banked and unbanked taxpayers opened a savings account (see Table 2), an empirical model that controls for potential selection bias is inappropriate.

<sup>25</sup> See Greene, 2003, page 716.

<sup>26</sup> This modeling technique was employed using LIMDEP software, version 8.0, 2000, Econometric Software, Inc., [www.limdep.com](http://www.limdep.com).

<sup>27</sup> One might consider the effects on the joint probability,  $\text{Prob}[\text{SAVACCT}=1, \text{UNBANKED}=0]$ , as in Christofides et al. (1997, 2000). The results shown in Table 4 are a mirror image for the case where  $\text{SAVACCT} = 1$  and  $\text{UNBANKED} = 1$ . Interested readers can obtain these results from the senior author.

<sup>28</sup> The results of a likelihood ratio test confirm that  $\rho$  is insignificantly different from zero at the .01 level of significance. The lack of detection for latent effects suggests that the SAVACCT model could have been estimated using a probit model that includes UNBANKED as a covariate. Under these circumstances, the marginal effects reported are the same.

<sup>29</sup> The total marginal effect of each binary variable in the model is computed using  $E[Y_1|Y_2=1, d=1] - E[Y_1|Y_2=1, d=0]$  where  $Y_1$  is SAVACCT,  $Y_2$  is UNBANKED, and  $d$  is the binary variable.

<sup>30</sup> When the EITC refund is substituted for total refund, the estimated marginal effects are quite similar and are larger at higher quartiles.