

# POVERTY AND THE EARNED INCOME TAX CREDIT

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*Abstract: Using the March 2012 Annual Social and Economic Supplement to the Current Population Survey, we estimated the effect of receiving the Earned Income Tax Credit (EITC) on the after-tax poverty status of low-wage earners. More specifically, we restricted our model to heads of household whose income was below the federal poverty line before taxes in order to determine whether the EITC lifts them out of poverty. Our probit regression models showed that those who received the credit were 53.3 percentage points more likely to be over the poverty line after taxes compared to those who did not receive the credit. Moreover, an additional \$100 in the value of the Earned Income Tax Credit increases the likelihood of being over the poverty line after taxes by .94 percentage points.*

## INTRODUCTION: THE EARNED INCOME TAX CREDIT

As the U.S. economy continues to struggle after the burst of the housing bubble in 2007 and the subsequent recession that lasted into 2009, poverty remains a significant issue. The working poor, as a group, are disproportionately affected by economic downturns. In 2012, there were 46.5 million people in poverty.<sup>1</sup> The U.S. Bureau of Labor Statistics defines the working poor as “persons who spent at least 27 weeks in the labor force (that is, working or looking for work) but whose incomes still fell below the official poverty level.”<sup>2</sup> The Earned Income Tax Credit (EITC) was introduced in 1975 as a means of offsetting payroll taxes paid by poor wage earners.

The primary purpose of the EITC is to lift people out of poverty and to help those only marginally above the poverty line to afford what they need.<sup>3</sup> Another goal of the EITC is to encourage labor market participation by rewarding employment. The credit is refundable, meaning that workers receive the benefit even if they do not owe any federal income tax. The EITC is the largest cash transfer welfare program in the U.S., benefitting more than 20 million taxpayers and costing over \$34 billion per year in

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1 Carmen DeNavas-Walt, Bernadette D. Proctor, and Jessica C. Smith, *Income, Poverty, and Health Insurance Coverage in the United States: 2012, P60-245* (Washington: U.S. Government Printing Office, 2013), 1. Accessed November 1, 2013. <http://www.census.gov/prod/2013pubs/p60-245.pdf>.

2 U.S. Bureau of Labor Statistics, *A profile of the working poor, 2011. (Report 1041)*(Washington: U.S. Government Printing Office, 2013), 1. Accessed October 9, 2013. <http://www.bls.gov/cps/cpswp2011.pdf>

3 Amy N. Mendenhall, “A Guide to the Earned Income Tax Credit: What Everyone Should Know About the EITC,” *Journal of Poverty* 10, no. 3 (2006).

2003.<sup>4</sup> For that year, this represented 6.9 percent of the U.S. population, benefitting from an expenditure that was 1.6 percent of the total federal budget.<sup>5</sup>

This study examined the effect of receiving the EITC on the after-tax poverty status of low-wage earners and their families. We hypothesized that receiving the EITC increases the likelihood that a family will be over the poverty line after taxes. We also anticipated that the likelihood of being over the poverty line after taxes will increase as the value of the EITC increases.

## LITERATURE REVIEW

### *Effectiveness*

The EITC is widely hailed as a successful program that helps to raise low-wage workers and their families out of poverty and encourage work.<sup>6</sup> Holt found that in 2003 the EITC raised 4.4 million people over the federal poverty line, over half of whom were children. He further noted that the EITC moves more children out of poverty than any other program, and that without it, the number of children living in poverty would be 25 percent higher.<sup>7</sup> Using pre-tax income data from the Current Population Survey Annual Social and Economic Supplement to calculate poverty status before and after the tax credit, Meyer concluded that in 2007 the EITC lowered the poverty rate overall by 10 percent and the poverty rate for children by 16 percent.<sup>8</sup>

### *Who Benefits from the EITC?*

In theory the EITC supports all low-wage workers; however, in practice, it is primarily single mothers who benefit from the credit.<sup>9</sup> Meyer noted that although the EITC is not expressly targeted to single mothers, the income ranges and the structure of the credit—which increases with the number of children in the household—direct it implicitly toward single mothers.<sup>10</sup> Additionally, because the credit amount grows larger with the number of children in the household, most EITC dollars are distributed to families with at least two qualifying children.<sup>11</sup>

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4 Gordon L. Berlin, “Rewarding the Work of Individuals: A Counterintuitive Approach to Reducing Poverty and Strengthening Families,” *The Future of Children* 17, no. 2 (2007).

5 U.S. Census Bureau, “Vintage 2003: National Tables,” Accessed February 28, 2014, <https://www.census.gov/popest/data/state/totals/2003/tables/NST-EST2003-02.pdf>; U.S. Government Printing Office, “Budget of the United States Government, 2003,” Accessed February 28, 2014, <http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=BUDGET&browseath=Fiscal+Year+2003&isCollapsed=false&leafLevelBrowse=false&isDocumentResult=true&ycord=70>

6 Steve Holt, “The Earned Income Tax Credit at Age 30: What We Know,” *Metropolitan Policy Program, The Brookings Institution* (2006), 26. Accessed October 7, 2013. <http://www.brookings.edu/research/reports/2006/02/childrenfamilies-holt>; Mendenhall, “A Guide”; B.D. Meyer, “The Effects of the Earned Income Tax Credit and Recent Reforms,” in *Tax Policy and the Economy, Vol. 24*, ed. J.R. Brown (Chicago: University of Chicago Press, 2010).

7 Holt, “The Earned Income Tax Credit”

8 Meyer, “The Effects”

9 Berlin, “Rewarding”

10 Meyer, “The Effects”

11 Holt, “The Earned Income Tax Credit”

Families below the poverty line are not the only ones who are helped by the EITC. Holt found that the average household income for eligible beneficiaries is approximately 125 percent of the federal poverty threshold.<sup>12</sup> By the same token, there are many living in poverty who are not helped by the credit. Holt further found that approximately one-third of households under the poverty threshold do not qualify for the EITC due to age (with many being elderly) or childlessness, and about the same number do not qualify for the credit because they lack earnings. He noted that of all households below the poverty threshold, only about 35 percent are eligible for the EITC.<sup>13</sup>

### *Disincentives to Marry and Lack of Public Awareness*

One of the drawbacks frequently cited about the EITC is that it presents a demonstrable disincentive to marry, even after marriage penalty reductions, which were introduced after 2005).<sup>14</sup> Hoffman observed that the primary causes of the penalty are the non-linear structure of the credit and the phase-out of benefits at larger income levels.<sup>15</sup> Berlin found that that the penalty especially affected married couples where both spouses earned similar wages.<sup>16</sup> This suggests that not only are couples who are individually eligible for the credit incentivized not to marry, but also that couples who are married and earning similar incomes may not be able to participate in the benefit.

Another issue affecting participation rates for eligible workers is that of awareness. There are discrepancies in awareness of the credit by race and by education level. Maag reported that in 2001, only 68 percent of low-income Black parents and a mere 27 percent of low-income Hispanic parents were aware of the EITC, and that parents with little education knew significantly less about it than parents with a college education.<sup>17</sup>

### *Some Arguments against the EITC*

The most commonly invoked argument against the EITC is the issue of noncompliance, or people filing for and receiving the credit when they are not eligible for it.<sup>18</sup> The EITC is regulated by the IRS but receives less monitoring than other cash transfer programs. This may explain why there are higher error rates for the EITC than for some other programs.<sup>19</sup> Some errors include the following: claiming children who do not meet the qualification criteria, reporting an incorrect address for children, failure to provide necessary documentation, and mistakes occurring due to language barriers; all of these which may lead to noncompliance.<sup>20</sup> To combat these issues the IRS has

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12 Ibid.

13 Ibid.

14 Berlin, "Rewarding"; Saul D. Hoffman, "The EITC Marriage Tax and EITC Reform" *University of Delaware Department of Economics Working Paper Series* No. 2003-01 (2003). Accessed October 7, 2013. <http://graduate.lerner.udel.edu/sites/default/files/ECON/PDFs/RePEc/dlw/WorkingPapers/2003/UDWP2003-01.pdf>

15 Hoffman, "The EITC Marriage Tax"

16 Berlin, "Rewarding"

17 Elaine Maag, "Disparities in Knowledge of the EITC," *Tax Notes* 106, no. 11 (2005): 1323.

18 Meyer, "The Effects"

19 Mendenhall, "A Guide"

20 Ibid.

done outreach to tax filers and preparers and required more proof of the claims made on tax forms.<sup>21</sup>

Another argument against the EITC is that it does not go far enough to address U.S. poverty. Rothstein pointed out that the analyses that find positive effects from the EITC on labor supply are based on fixed-wage analyses, whereas adjusting wages for changing elasticities in labor demand significantly weakens the case for the program. He found that declines in wages for single mothers—caused by an increase in the labor supply as a response to the EITC—offset increases in work hours, making the net effect of the credit inconsequential.<sup>22</sup> In addition, Alstott noted that use of the federal poverty line is something of an artificial measure, as that threshold is much lower than is reasonable for even a very low standard of living. She cited 200 percent of the poverty line as a more reasonable measure and found that even the maximum EITC amount of \$5,028 does not cover the difference between minimum-wage earnings and 200 percent of the poverty threshold for any size household, even for full-time year-round work.<sup>23</sup>

Finally, Alstott pointed out that the EITC only provides a real benefit to low-wage workers while they are employed; it is this class of workers that is more likely to experience interruptions in employment due to layoffs, voluntary separation, and disability, than workers earning higher wages.<sup>24</sup>

Arguments for and against the EITC are important in any analysis of the effectiveness of the EITC. However, the program has arguably been of benefit to the families who have participated in it, and some economists and scholars argue instead for an expansion of the credit to pay larger benefits to low-wage workers who are not custodial parents. Berlin posited that the EITC would be a greater contributing factor to social equity and an important incentive toward employment if it were targeted toward individuals regardless of marital or custodial status and calculated based on individual rather than joint income.<sup>25</sup> Berlin also noted that low-wage noncustodial parents—fathers, in particular—would be in a much stronger position to pay child support to their custodial co-parents if they were earning this credit as a supplement to their wages.<sup>26</sup> The Center for Budget and Policy Priorities has also suggested several improvements to the EITC. The Center believes that the EITC should be strengthened for childless workers. This can be done by lowering the minimum age, and raising the maximum credit and phase-in rate for these workers.<sup>27</sup>

## THEORETICAL BACKGROUND AND MODEL

The federal EITC began in 1975 as a program to reduce poverty for low-income working individuals and families. “It is designed to lift the working poor above the

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21 Ibid.

22 Jesse Rothstein, “Is the EITC as Good as an NIT? Conditional Cash Transfers and Tax Incidence,” *American Economic Journal: Economic Policy* 2, no. 1 (2010).

23 Anne Alstott, “Why the EITC Doesn’t Make Work Pay,” *Law and Contemporary Problems* 73, no. 1 (2010).

24 Ibid.

25 Berlin, “Rewarding”

26 Ibid.

27 Center on Budget and Policy Priorities, “Strengthening the EITC for Childless Workers Would Promote Work and Reduce Poverty,” Accessed February 25, 2014. <http://www.cbpp.org/cms/?fa=view&id=3991>.

poverty line and further supplement the income of the near poor to a point at which both groups can better afford the daily necessities.”<sup>28</sup> This acknowledges the fact that there are millions of people in the U.S. that are part of the working poor. Low wages make it extremely difficult for many of these people to lift themselves out of poverty. 7.2 percent of workers aged 18-64 were part of the working poor in 2011.<sup>29</sup> In order to qualify for the EITC, an individual or married couple must have wages from work, have a valid social security number, and have filed a tax return, in addition to other requirements.<sup>30</sup>

The EITC is a refundable tax credit that increases for each dollar amount that the individual or couple earns from work. It is adjusted for the number of eligible children in the household. Once the household income reaches a specified level (depending on family size), the individual or couple is eligible for the maximum credit. As income increases even further, the individual or couple continues to receive the maximum credit until they reach the beginning of the phase-out range, where a reduction in the credit occurs for each additional dollar amount of income until it reaches zero.<sup>31</sup>

When the EITC first began in 1975, the maximum credit was \$400. Since then, there have been a number of changes that have substantially increased the maximum credit available and widened the range of eligible incomes.<sup>32</sup> The last expansion of the EITC occurred as a result of changes made in the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA created a category for families with three or more children and broadened the phase-in range for married couples.<sup>33</sup> These changes were intended to be a temporary response to the Great Recession. The American Taxpayer Relief Act of 2012 (ATRA) extended the ARRA changes through 2017.<sup>34</sup>

As mentioned previously, the EITC has been shown to lift families out of poverty, with Holt showing that in 2003, 4.4 million people were thus assisted by the credit, and Meyer observing, in CPS income data for 2007, that the overall poverty rate was reduced by at least 10 percent.<sup>35</sup> The EITC acts as a supplement to the low wages that many families receive. In theory, providing a supplement to workers’ incomes will increase their after-tax income. This increases their income-to-poverty ratio and increases the likelihood that they will be above the poverty threshold after taxes.

A theoretical linear model of the effect of the EITC on poverty status would look as follows:

$$(1) Pr(y_i=1|x_i) = \beta_0 + \beta_1 x_i + \delta Z_i + \varepsilon_i$$

28 Mendenhall, “A Guide”, 52.

29 DeNavas-Walt, Proctor, and Smith, *Income, Poverty, and Health*, <http://www.census.gov/prod/2013pubs/p60-245.pdf>.

30 Internal Revenue Service, “Life’s a Little Easier With EITC,” Accessed December 29, 2013, <http://www.irs.gov/pub/irs-pdf/p3211.pdf>.

31 Tax Policy Center, “Historical EITC Parameters,” Accessed February 26, 2014, <http://taxpolicycenter.org/taxfacts/displayfact.cfm?Docid=36>.

32 G.B. Dahl and L. Lochner, “The Impact of Family Income on Child Achievement: Evidence from the Earned Income Tax Credit,” *American Economic Review* 102, no. 5 (2012); Y. Lim and C. Lemieux, “Potential Impact of EITC Adjustments on Financial Self-Sufficiency among Low-Income Families: A Simulation Model,” *Journal of Sociology & Social Welfare* 35, no. 2 (2008); Mendenhall, “A Guide”

33 American Recovery and Reinvestment Act of 2009. P.L. 111-5.

34 American Taxpayer Relief Act of 2012. P.L. 112-240.

35 Holt, “The Earned Income Tax Credit”; Meyer, “The Effects”

Where  $y$  = a dummy variable for having an income above the poverty line after taxes,  $x$  = a dummy variable for EITC receipt,  $Z$  is a vector of other covariates, and  $\epsilon$  is an error term. This theoretical model is useful because it measures the probability that an individual or household would be out of poverty after taxes. In our study, we created two models—one with a continuous measure of EITC value and another with a binary measure of EITC receipt. Our hypothesis was that receiving the EITC increases the likelihood that a family will be over the poverty line after taxes, and that the likelihood of being over the poverty line after taxes increases as the value of the EITC increases.

### *Data*

The data for this study come from the Current Population Survey (CPS), Annual Social and Economic Supplement (ASEC) of 2012. The U.S. Census Bureau administers the basic CPS each month. In addition to the basic monthly files, there are supplementary files that include the basic data and additional topical data. The ASEC is the March Supplement to the CPS. It is a nationally representative sample of the “civilian non-institutionalized population of the U.S. living in housing units and members of the Armed Forces living in civilian housing units on a military base or in a household not on a military base.”<sup>36</sup> Data is collected through in-person and telephone interviews. While the basic CPS monthly survey mostly includes data on employment, the ASEC provides more detailed data on income, demographics, program participation, taxes, and work experience. The income and tax information are asked for the previous year. This dataset is well suited for this study because it is the most recent data available and includes variables that measure total family income, EITC receipt, tax liability before and after credits, and poverty thresholds. It also includes data on respondents’ race, ethnicity, education, marital status, and age.

The full sample contains 201,398 individuals in 74,383 unique households. To obtain the analytic sample, we only included observations for the reference person in each household. The reference person in the survey is the most knowledgeable adult or head of household. The data from the reference person contains all of the information relevant to this study—most notably, family income, EITC receipt, and tax liability. Of the individuals in the full sample, 74,383 were heads of household. The sample was further restricted to heads of household whose family was under the poverty threshold before taxes (10,598). Of these heads of household, only 4,874 had earnings from work, self-employment, or farm income. Therefore, our final analytic sample contained 4,874 heads of household.

The dependent variable is a poverty dummy variable where 1 = above the poverty line after taxes, and 0 = below the poverty line after taxes. To determine poverty status after taxes, we first had to determine after-tax income. To do this, we used several variables from the dataset. They were: total family income before taxes, federal income tax liability after credits were applied, state income tax liability after credits were applied, and poverty threshold for each family (given family size); these are all

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36 U.S. Census Bureau, *Current Population Survey, 2012 Annual Social and Economic Supplement Technical Documentation* (Washington: U.S. Government Printing Office, 2012), 1-1. Accessed October 31, 2013. <http://www.census.gov/prod/techdoc/cps/cpsmar12.pdf>

continuous variables measured in dollars. The formula to determine after-tax liability was as follows:

$$(2) \text{ after tax income} = \text{total family income} - \text{federal income tax liability after credits} - \text{state income liability after credits}$$

We used the after-tax income variable along with poverty threshold to create a new variable that measured each family's poverty ratio after taxes. The formula was as follows:

$$(3) \text{ poverty ratio after tax} = \text{after tax income} / \text{poverty threshold}$$

This was a continuous variable. We recoded this into a dummy variable as stated above.

The independent variable of interest was a continuous EITC variable representing the dollar amount of EITC the family received. We also created a dummy variable where 1 = received the EITC, and 0 = did not receive the EITC.

The control variables included in the model were: a continuous variable for age, dummy variables measuring education (less than high school, high school, and post-secondary education); ethnicity (Hispanic); race (white, black, Asian / Hawaiian / Pacific Islander, Native American / Alaska Native, and mixed race); and marital status.

Appendix 1 displays the descriptive statistics for the variables included in our analysis. There are 4,874 heads of household in the sample. 3,306 are female, and 1,838 are male. The average age is 38, with the lowest being 15 and the highest being 85. There were 1,350 people who did not complete high school, 1,634 who earned a high school diploma, and 1,890 who had some sort of post-secondary education (some college, associate's degree, bachelor's degree, master's degree). The average amount of EITC received was \$2,051.37, and it ranged from \$0 to \$5,751. There were 1,292 heads of households who were above the poverty line after taxes, and 3,582 who remained under the poverty line after taxes. There were also 1,730 heads of households who were married, and 3,144 who were either single, divorced, or widowed. 3,434 heads of household reported their race as white; 945 as black; 247 as Asian, Hawaiian, or Pacific Islander; 128 as Native American or Alaska Native; and 120 as mixed race. 1,426 heads of household self-identified as being of Hispanic ethnicity.

### *Empirical Method*

Our dependent variable is a binary variable that describes poverty status after taxes. Accordingly, we estimated probit models to determine the effect of receiving the EITC on poverty status after taxes. To test the robustness of our model, we also estimated a linear probability model (LPM). Our preferred model is a probit regression because our dependent variable had only two values, coded as 0 and 1. The LPM is usually not ideal because it can result in predicted probabilities outside of the [0,1] range. The LPM also keeps the average partial effects constant and has an inherent problem of heteroskedasticity. While the problem of heteroskedasticity can be resolved using robust standard errors, if a significant number of fitted values are either below 0

or above 1, the LPM will not produce a good approximation of the true data generating process (DGP).<sup>37</sup>

Probit models estimated by maximum likelihood ensure that the conditional probability is bounded by 0 and 1. We report the average partial effect of a continuous  $x$  (in this case the continuous or binary measure of EITC) as:

$$N^{-1} \sum_{i=1}^N [\beta_1 \phi (\hat{\beta}_0 + \hat{\beta}_1 x_i + \hat{\beta}_2 Z_i)]$$

Where  $\phi$  is the standard normal probability distribution function (PDF),  $x$  is the continuous or binary EITC variable, and  $Z$  is an index of covariates measuring age, race, ethnicity, education, gender, and marital status. The average partial effects are directly comparable to OLS estimates.<sup>38</sup>

## RESULTS

### *Models with a Continuous EITC Variable*

The results of our probit regression model of the effect of the continuous EITC variable on after-tax poverty status are shown in Appendix 2. The results indicate that there is a statistically significant effect of increasing the value of the EITC on after-tax poverty status ( $p < .001$ ). The average partial effect of the EITC variable was .000094. This indicates that each additional \$100 in EITC makes the head of household .94 percentage points more likely to be above the poverty line, holding all else constant. In addition, an increase in EITC equal to one standard deviation is predicted to make the head of household 19.93 percentage points more likely to be above the poverty line, holding all else constant. It is important to note, however, that this result assumes a fairly inelastic labor demand, which does not allow for wages declining in response to the overall increase in income for wage earners from the EITC.

Heads of household who earned a high school diploma were 4.35 percentage points more likely to be above the poverty line after taxes compared to those who did not complete high school. Attending at least some college made heads of household 5.07 percentage points more likely than high school graduates to be above the poverty line. In addition, Hispanic heads of household were 3.73 percentage points more likely than non-Hispanic heads of household to be above the poverty line. Our probit model had an  $R^2$  of .3751, so the model explains 37.51 percent of the variation in after-tax poverty status. 82.03 percent of the fitted values were correctly predicted. Race, gender, marital status, and age were not statistically significant.

We also ran a linear probability model, which is easier to interpret than probit coefficients, despite the drawbacks specified previously. The results are displayed in Appendix 2. We found a statistically significant effect of receiving the EITC on after-tax poverty status ( $p < .001$ ). The coefficient on EITC was .0001286. Heads of household with a higher value of the earned income tax credit were significantly more likely to not be in poverty after taxes. Specifically, this indicates that an additional \$100

<sup>37</sup> Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach, 5th Edition* (Mason, OH: South-Western Cengage Learning, 2013), 251.

<sup>38</sup> See Wooldridge p. 583-587 for more on probit models.

in EITC credit makes the head of household 1.3 percentage points more likely to be above the poverty line after taxes, which is very similar to the probit average partial effects.

The coefficient on high school diploma was also significant, with a value of .0488 ( $p=.001$ ). Having a high school diploma makes a head of household 4.8 percentage points more likely to be above the poverty line after taxes compared to those who did not complete high school. The coefficient on post-secondary education was .05636; having at least some post-secondary education makes a head of household 5.6 percentage points more likely to be above the poverty line compared to those who completed less than high school. The Hispanic variable was also significant, with a value of  $-.03933$ . Hispanic heads of household were 3.9 percentage points less likely than non-Hispanics to be above the poverty line after taxes. Race, female, married, and age were not statistically significant.

Our linear probability model had an  $R^2$  of .3844, indicating that the model explains 38.44 percent of the variation in after-tax poverty status. 81.99 percent of the fitted values were correctly predicted, which is slightly lower than that of the probit model.

### *Models with a Binary EITC Variable*

We ran a probit model using a binary independent variable (EITC receipt versus non-receipt) in place of the continuous variable (see Appendix 3). In this model, the pseudo  $R^2$  was 0.1484, indicating that 14.84 percent of the variation in after-tax poverty status could be explained by the independent variables in the model. This model resulted in average partial effects (APEs) of EITC receipt, female gender, married status, and age being statistically significant at the .05 level or smaller. The average partial effect of EITC receipt was .533 ( $p<.001$ ), indicating that, according to this model, receipt of the EITC increases the likelihood of being out of poverty by 53.3 percentage points compared to not receiving the credit, holding all else constant.

This probit model also indicates that, assuming fixed wages associated with inelastic labor demand, earning a high school diploma increases the likelihood of being out of poverty by 5.2 percentage points; that completing at least some post-secondary education increases this likelihood by 3.8 percentage points; and that Hispanic ethnicity increases the likelihood by 4.8 percentage points. Further, being female and being married both increase the likelihood of being out of poverty after taxes by 5.6 and 14.7 percentage points, respectively. As age increases, the chances of being out of poverty after taxes are shown to decrease by .48 percentage points. 73.59 percent of the predicted probabilities were correctly predicted.

In a linear probability model using the binary EITC dependent variable, the  $R^2$  was 0.1213, indicating that 12.13 percent of the variation in after-tax poverty status could be explained by the independent variables in the model. The coefficients on EITC receipt (.261), female gender (.061), married status (.162), and age (-.004) were all statistically significant at the  $p<0.001$  level. Coefficients on variables for high school diploma (.055), post-secondary education (.037), and Hispanic ethnicity (.052) were statistically significant at the .05 level. These results show that receipt of the

credit increases the likelihood of being out of poverty after taxes by 26.1 percentage points and were half the size of those obtained from the probit model. 73.49 percent of the fitted values were correctly predicted, which again is slightly lower than the probit model.

## DISCUSSION

Our models showed that receiving the EITC has a statistically significant effect on the after-tax poverty status of low-wage workers, and that the amount of EITC received is related the after-tax poverty status. Therefore, both of our hypotheses were supported by the statistically significant results we obtained. However, the average partial effect of the continuous EITC variable was very small (.000094). In this model, there is no practically significant effect of an additional dollar of EITC on the poverty status of the people in our sample. An additional dollar in EITC makes a head of household .0094 percentage points more likely to be above the poverty line after taxes. Even when we calculate to determine the effect of an additional \$100 of EITC, it only makes the head of household .94 percentage points more likely to be above the poverty line. Based on our model, it would take an additional \$1,000 in EITC to obtain practically significant results. Each additional \$1,000 in EITC makes a head of household 9.4 percentage points more likely to be above the poverty line after taxes. While these results suggest that increasing the value of the EITC will lead to an increased likelihood of being above the poverty level, it is not realistic to recommend that the EITC be increased by \$1,000 in order to increase the likelihood by 9.4 percentage points.

A probit model measuring the effect of a binary variable of EITC receipt predicted an average partial effect of .533. According to this model, receiving the EITC increases the likelihood of being above the poverty line after taxes by 53.33 percentage points compared to those who did not receive the EITC, all else being equal. Since all of the heads of household in the sample were in poverty before taxes, receiving the EITC is associated with an increased likelihood of being lifted out of poverty after taxes. These results support our hypothesis that receiving the EITC will increase the likelihood of being above the poverty line after taxes. However, our OLS model found that the partial effect of EITC receipt on after-tax poverty status was half that of our probit average partial effect. This large difference is unusual, given the fact that LPM and probit average partial effects are usually very similar.

Our analysis suffered from several limitations. One limitation is that we assumed that people who received the EITC and people who did not receive the EITC were equivalent in all other respects after controlling for the covariates in our model. There are reasons why this may not be correct. Some of the people who did not receive the EITC may not have been eligible in the first place. As mentioned previously, Holt found that of all households below the poverty threshold, only about 35 percent are eligible for the EITC.<sup>39</sup> Eligibility requirements for the EITC include having a valid social security number, filing a federal tax return, being a U.S. citizen or resident alien or being married to a U.S. citizen or resident alien for the entire tax year, and having

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<sup>39</sup> Holt, "The Earned Income Tax Credit"

a qualifying child.<sup>40</sup> If an individual does not have a qualifying child, they must be between the ages of 25 and 65 and live in the U.S. for more than half of the filing year.<sup>41</sup> Due to the limitations of our dataset, we were unable to restrict our analytic sample to only those who were eligible for the EITC.

Another limitation is that we were unable to control for the receipt of a state EITC. In 2012, 24 states and the District of Columbia provided a supplemental EITC as a percentage of the federal EITC that a household is eligible for.<sup>42</sup> This can have an effect on the after-tax poverty status of households. Our dataset did not include information on state EITC receipt, and we were therefore unable to control for this in our models.

Finally, we used a fixed-wage analysis, with the assumption of an inelastic labor demand that does not result in reduced wages in response to the EITC. We opted for the fixed-wage scenario in light of previous findings that the significant majority of labor supply increases in response to the EITC take place among single mothers.<sup>43</sup> For the parameters of this study, we included all household types, not just single-mother families.

A suggestion for further study would be to test the effects of the EITC on other outcomes and to use a similar model but with an assumption of wages adjusted for a more elastic labor demand. Researchers could estimate models that predict whether workers respond to the work incentives of the EITC by working additional hours. Another possibility would be to determine if receiving the EITC has an effect on child health or school performance. Propensity score matching based on EITC receipt may also be used. In addition, although the EITC has a primary goal of lifting individuals and families out of poverty, research has shown that it has been used by many who are above the poverty line. In light of Holt's finding that the average household income for EITC beneficiaries is approximately 125 percent of the federal poverty threshold, further research should be done to determine how receiving a wage supplement in the form of the EITC can affect the well-being of families who are low income but not below the federal poverty line. Further research would also benefit from including additional control variables such as other tax credits claimed, unemployment rate, and cash assistance received.

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40 Internal Revenue Service, "Life's a Little Easier"

41 Ibid.

42 Center on Budget and Policy Priorities, "Policy Basics: State Earned Income Tax Credits," Accessed December 29, 2013, <http://www.cbpp.org/cms/?fa=view&id=2506>.

43 Nada Eissa and Jeffrey B. Liebman, "Labor Supply Response to the Earned Income Tax Credit," *The Quarterly Journal of Economics* 111, no. 2 (1996); Bruce D. Meyer, "Labor Supply at the Extensive and Intensive Margins: The EITC, Welfare, and Hours Worked," *The American Economic Review* 92, no. 2 (2002).

## APPENDIX 1: DESCRIPTIVE STATISTICS

<i>Variables</i>	<i>Mean (SD)</i>
Not in poverty after taxes	.242 (.428)
Value of EITC	2,051.37 (2,120.43)
EITC (1=Received)	.8010 (.3993)
Education	
High School	.3352 (.4721)
Post-Secondary Education	.3991 (.4898)
Hispanic	.2675 (.4427)
Asian/Hawaiian/Pacific Islander	.0475 (.2127)
Black	.2212 (.4151)
Native American/Alaska Native	.0190 (.1364)
Mixed Race	.0220 (.1467)
Female	.6156 (.4865)
Married	.3299 (.4702)
Age	37.93 (13.21)
N	4,874

*Note: Sampling weight was used*

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APPENDIX 2 – REGRESSION RESULTS WITH CONTINUOUS EITC VARIABLE

<i>Variables</i>	<i>Probit Coefficients</i>	<i>Probit APE</i>	<i>OLS Coefficients</i>
EITC value	0.0005 (0.0000)***	0.0001 (0.0000)***	0.0001 (0.0000)***
High School	0.2289 (0.0760)***	0.0435 (0.0143)***	0.0488 (0.0152)***
Post-Secondary Education	0.2673 (0.0777)***	0.0507 (0.0146)***	0.0564 (0.0146)***
Asian/Hawaiian/Pacific Islander	-0.0222 (0.1392)	-0.0042 (0.0264)	-0.0030 (0.0282)
Black	-0.1097 (0.0730)	-0.0208 (0.0138)	-0.0232 (0.0137)*
Native American Alaska Native	0.0646 (0.2392)	0.0123 (0.0455)	-0.0024 (0.0504)
Mixed Race	-0.2573 -0.2145	-0.0489 (0.0407)	-0.0455 (0.0358)
Hispanic	-0.1964 (0.0704)***	-0.0373 (0.0134)***	-0.0393 (0.0145)***
Female	0.0395 (0.0595)	0.0075 (0.0113)	-0.0010 (0.0108)
Married	-0.0006 (0.0689)	-0.0001 (0.0131)	-0.0170 (0.0147)
Age	-0.0032 (0.0025)	-0.0006 (0.0005)	-0.0000 (0.0003)
Constant	-2.0879 (0.1306)***		-0.0375 (0.0206)*
			0.384
Pseudo	0.375		
N	4,874	4,874	4,874

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , robust standard errors in parentheses, a sampling weight was used.

## APPENDIX 3: REGRESSION RESULTS WITH DUMMY EITC VARIABLE

<i>Variables</i>	<i>Probit Coefficients</i>	<i>Probit APE</i>	<i>OLS Coefficients</i>
EITC	2.0020 (0.1771)***	0.5331 (0.0464)***	0.2607 (0.0097)***
High School	0.1938 (0.0653)***	0.0516 (0.0173)***	0.0547 (0.0179)***
Post-Secondary Education	0.1419 (0.0662)**	0.0378 (0.0176)**	0.0367 (0.0174)**
Asian/Hawaiian/ Pacific Islander	0.0317 (0.1153)	0.0084 (0.0307)	0.0103 (0.0309)
Black	0.0777 (0.0654)	0.0207 (0.0174)	0.0186 (0.0174)
Native American Alaska Native	0.0885 (0.2255)	0.0236 (0.0601)	0.0202 (0.0672)
Mixed Race	-0.1677 (0.1762)	-0.0447 (0.0469)	-0.0480 (0.0414)
Hispanic	0.1817 (0.0597)***	0.0484 (0.0158)***	0.0516 (0.0171)***
Female	0.2115 (0.0524)***	0.0563 (0.0139)***	0.0608 (0.0132)***
Married	0.5505 (0.0535)***	0.1466 (0.0137)***	0.1618 (0.0158)***
Age	-0.0181 (0.0022)***	-0.0048 (0.0006)***	-0.0040 (0.0004)***
Constant	-2.3898 (0.1862)***		0.0417 (0.0234)*
			0.121
Pseudo	0.148		
N	4,874	4,874	4,874

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , robust standard errors in parentheses, a sampling weight was used.

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