

The Impact of Earned Income Tax Credit on Food Insecurity in Children

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Introduction

It is hard to imagine that food insecurity could be a problem in this country in the 21st Century. To the outside observer, it might seem as if we Americans have the opposite problem: too much food to eat. Nonetheless, many families in the United States struggle to stretch a paycheck into a week's worth of meals. While income level is not the only determinant of food insecurity, as seen in the table, it is still a major contributor to the problem. Numerous programs such as the Food Stamp Program, TANF, and EITC help to alleviate the problems of food insecurity by supplementing income in various ways. By studying food insecurity, our goal is to determine the individual impact of Earned Income Tax Credit on levels of food insecurity in the United States. Our hypothesis is that EITC will lower food insecurity in children. We will try to determine the effectiveness of EITC among different groups of children.

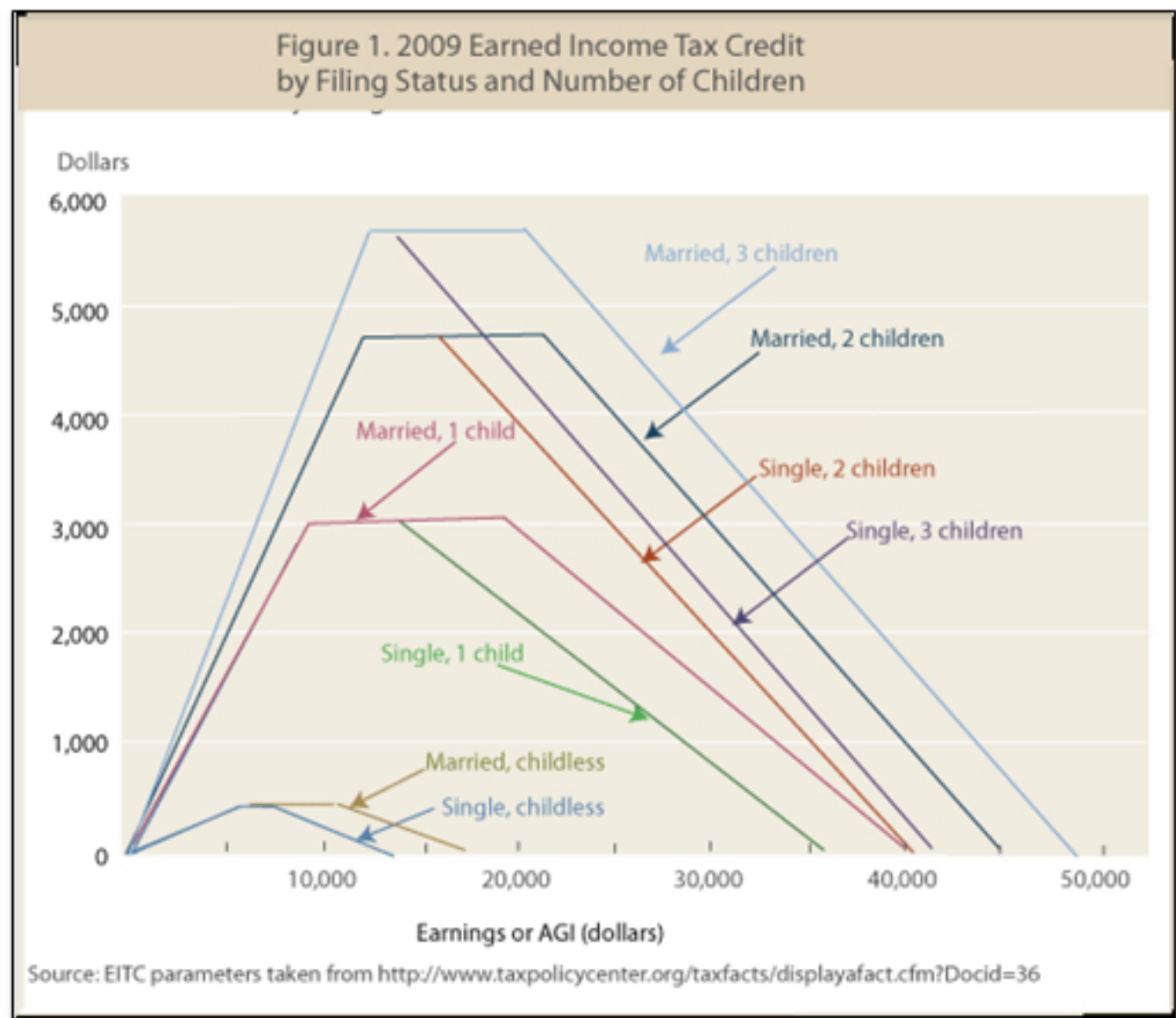
Food Insecure Children, by Poverty Level			
*Poverty Threshold Group	Food Insecurity Present in Household		Total
	0	1	
1	1,711 7.56%	120 19.39%	1,831 7.87%
2	2,039 9.00%	147 23.75%	2,186 9.40%
3	2,683 11.85%	134 21.65%	2,817 12.11%
4	2,551 11.26%	103 16.64%	2,654 11.41%
5	2,329 10.28%	54 8.72%	2,383 10.24%
6	11,333 50.04%	61 9.8%	11,394 48.97%
Total	22,646 100.00%	619 100.00%	23,265 100.00%

* The first group shows children between 0 and 50% of the poverty line. The subsequent groups represent increases by 50%

Earned Income Tax Credit

The Earned Income Tax Credit differs from traditional welfare programs in that it is focused on encouraging work among its recipients. It achieves this by rewarding workers with tax credit for each earned dollar up to a certain amount, avoiding marginal benefit reduction rates that create work

disincentives in programs such as the old AFDC. After a certain point, the benefits are slowly reduced as the recipient's income continues to rise. Eventually, when income is high enough, the benefits are phased out completely. Whereas some programs provide maximum benefits at zero income, EITC provides no tax credit to families with zero earned income. In addition, EITC is focused primarily on families with children.



Method and Model

We gathered the majority of our data from the Survey of Income and Program Participation (SIPP) database. Although the SIPP database contains panel data, we used only cross-sectional data by looking at data from many families for only one month. Since we use a binary variable for our dependent variable, we use a Linear Probability Model (LPM) in our regressions to capture the probability of success in the limited dependent variable.

$$F_i = f [T_i, H_i, S_i, C_i, I_i, K_i, W_i, P_i]$$

Where:

F_i= This variable is a binary dummy variable that takes on the value of one when food insecurity is present in the observation's household.

T_i= The dollar amount of Earned Income Tax Credit received by the child's household, and its squared value.

H_i= Vector of demographic characteristics in the child's household.

S_i= Vector measuring benefits of the child's state of residence. Maximum State EITC and TANF benefits capture the generosity of the state.

C_i= Vector of major costs and expenditures within the household, taken as a percentage of household income.

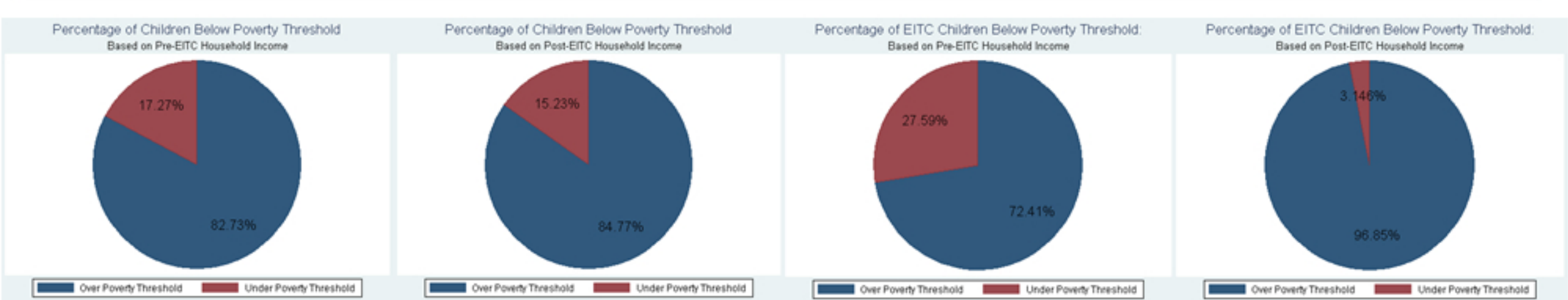
I_i= Vector of household income and employment variables

K_i= Dollar value of food stamps, TANF, and other transfer payments

W_i= Total Net Worth for the child's household

P_i= Flag for household participation in at least one program with cash or non-cash benefits.

Results



Before analyzing the output from our regression model, it can be helpful to get a quick overview of the EITC's effect on children's well-being. The graphs in Figure 3 show the percentage of kids lifted above the poverty threshold when the value of EITC is added to their household income. The first set of graphs show the impact on the whole sample, while the second set of graphs shows the impact among EITC recipients. It is clear that EITC has a positive impact on the sample, although the program still leaves many below the poverty line. While these graphs give us an idea of EITC's overall effect, we do not know how its impact varies among different sub-groups of the sample.

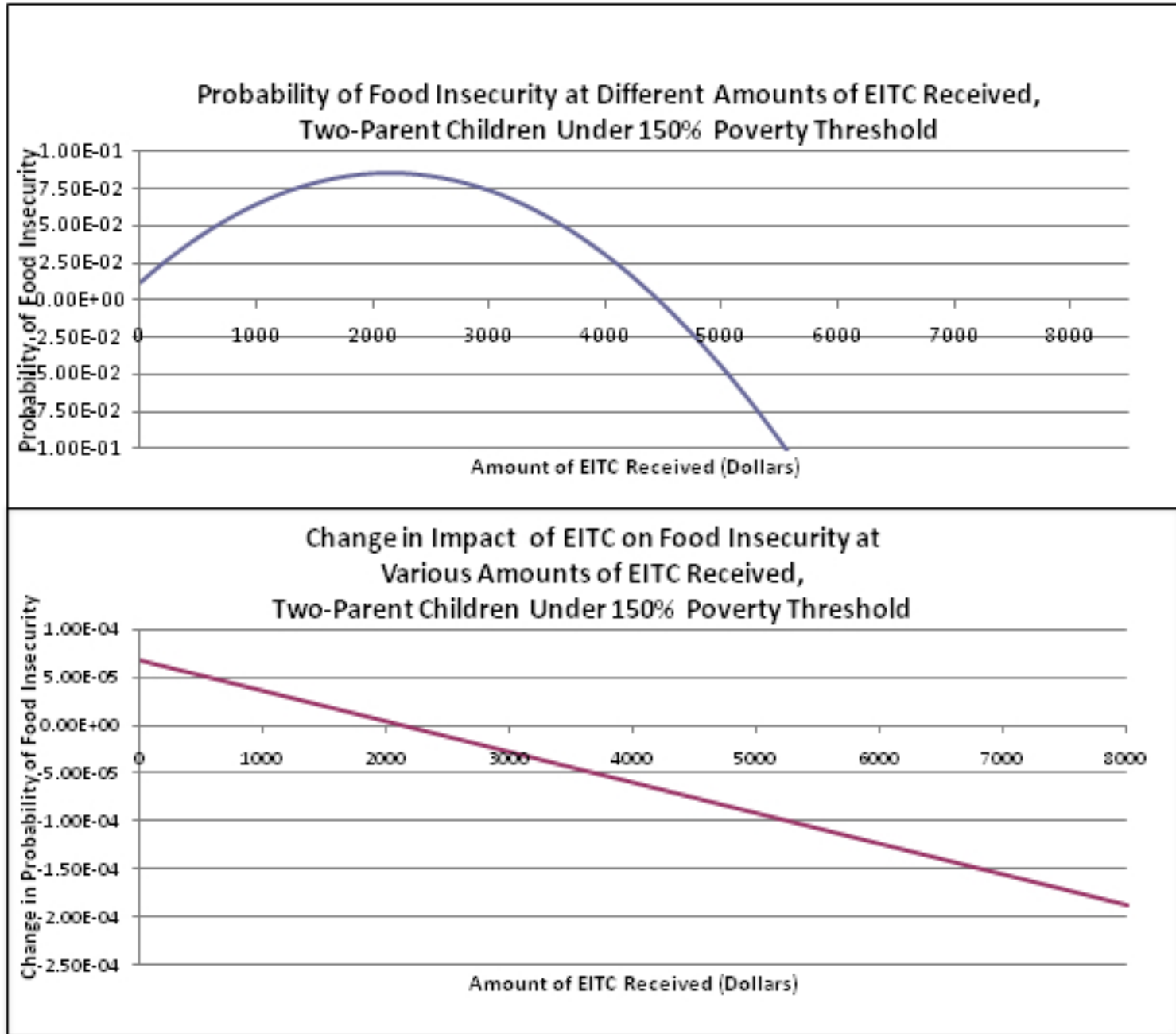
A cross tabulation shows the differing effect that Earned Income Tax Credit has among two-parent and single-parent households. The first table shows the risk of poverty without the EITC program among both two-parent and single-parent children. The second table factors in the value from EITC and shows the change in poverty risk among the children. The risk of poverty drops for both groups with the addition of EITC. It seems to be especially effective among single-parent children, where the risk of poverty fell from 33.72% to 29.91%. While there is a definite improvement among the children, the fact that 15.23% of the sample remains at risk for poverty despite the impact of EITC shows that there is room for improvement in the program.

Regression Analysis:

Effect of EITC on Food Insecurity Among EITC Children							
	Full Sample	Under 150% Poverty Threshold	Family Type		Family Type, Under 150% Poverty Threshold		Black, Single-Parent, Under 150% Poverty Threshold
			Two-Parent	Single-Parent	Two-Parent	Single-Parent	
TAXCRED							
Coefficient	7.23E-06	1.45E-05	-1.09E-05	-5.91E-06	6.86E-05	-5.01E-05	-1.60E-04
P-Value	0.626	0.389	0.708	0.75	0.006	0.094	0.049
TAXCRED^2							
Coefficient	-1.15E-09	-5.76E-09	5.68E-09	-1.07E-09	-1.60E-08	4.93E-09	3.95E-08
P-Value	0.703	0.034	0.427	0.685	0.004	0.241	0.051
Turning Point:	3143.48	1258.68	959.51	2761.68	2143.75	5081.14	2025.32
Mean							
TAXCRED:	2186	2360	2092	2277	2301	2408	2149
Max TAXCRED:	8000	8000	6950	8000	6950	8000	4000

* Results for TAXCRED and TAXCRED^2 taken from larger regression

The EITC program is designed to encourage work by imposing a negative marginal tax on low levels of earned income, it is not designed to lower food insecurity. Therefore, the impact of EITC on food insecurity may vary among the children depending on a multitude of other household factors. In order to view this impact, we segmented our data on EITC recipients into sub-samples by household traits. By estimating our model for each select sub-sample, we were able to evaluate the impact of EITC on food insecurity within that particular demographic group. The estimated impacts for the EITC amount and its squared value are included in the table above. In addition, for each sub-sample, the table includes the average and maximum value of EITC along with the point at which the estimated EITC impact switches signs. The values on the coefficients for the two variables tend to alternate between different sub-samples, indicating the varying effects of EITC on food insecurity at different levels of earned income. For two-parent households under 150% of the poverty threshold, EITC is only effective at lowering the probability of food insecurity after the amount of tax credit rises above \$2,144. However, for African American children in single-parent families under 150% of the poverty threshold, the EITC decreases food insecurity at low levels of the benefit, but becomes less effective at higher levels of income, or as the amount of tax credit exceeds \$2,025.



The graph to the left shows the estimated probability of food insecurity at different levels of EITC. The limitations of the Linear Probability Model become evident in this graph, as the probability becomes negative at higher levels of EITC. The second graph shows estimated *changes* in the probability of food insecurity, or the marginal impact of EITC on food insecurity, at different EITC levels.

Conclusions

The results show that the Earned Income Tax Credit has a positive effect on children's well-being. On the basis of poverty alone, the EITC lifted a substantial number of children above the poverty threshold. The fact that many remained below the threshold however indicates that the program has room for improvement. The impact of EITC on children's food insecurity is more complex, and therefore harder to analyze. The results were likely biased by negative selectivity in the data. The fact that children receiving EITC are likely to be food insecure in the first place obscures the true relationship between the two variables. To analyze the differing effects of EITC, it is important to compare the turning point of the equation to the mean value for the group. For some groups, such as two-parent families under 150% of the poverty line, the EITC significantly lowers the probability of food insecurity after the benefit rises above \$2,144. Since this value is below the mean EITC amount, the average child in that group is helped by EITC. For other groups, the EITC advantage kicks in earlier but wears off at higher levels. For a child in a single-parent home at less than 150% of the poverty threshold, EITC decreases the probability of food insecurity until the credit reaches \$5,081. This value is much higher than the average of \$2,408, indicating that the average child in this group is helped by EITC.

Aspects for Future Work

This research represents a preliminary investigation into the practicality of using SIPP to analyze EITC impacts on child well-being. Future work would include the following:

Logistical Regression: A logistical regression provides a better fit in a model with a limited dependent variable. We used a Linear Probability Model because our coefficient outputs from the LPM were not very different from those of the logistical regression. The logistical model however would not have the problem of negative probabilities, which we found with the LPM.
Panel Data: We did not have time to utilize the panel capabilities of our dataset, and instead only used a cross-sectional model. Future work can examine children over the course of the study to determine how a change in EITC alters their well-being.

Selectivity Model: To circumvent the negative selectivity bias, we would need to create an equation that models selection into the Earned Income Tax Credit program. The model would need to include instrumental variables that affect EITC, but do not influence food stamp eligibility or food insecurity. Once this model is determined, the predicted values could be used in our original model to determine a more accurate estimate of EITC's impact of food insecurity.
Other Measures of Child Well-Being: Poverty counts and food insecurity are not the only measurements of child well-being that we are interested in. Future studies will explore academic achievement, parental anger, adequate shelter, child health and health coverage.

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EITC diagram from the Tax Policy Center's website at <http://www.taxpolicycenter.org/briefing-book/key-elements/family/eitc-cfm>
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