The Long-Term Impact of the Earned Income Tax Credit on Entrepreneurship

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Abstract

The recipients of the Earned Income Tax Credit (EITC) are not the only one affected; the children of the recipients also benefit from the credit. The impacts from the credit can extend into adulthood, affecting a variety of adult outcomes. This paper evaluates the long-term impact of the EITC exposure during childhood on the likelihood of becoming an entrepreneur as an adult. Increasing childhood EITC exposure increases the likelihood of owning a business as an adult, but does not affect the probability of being self-employed. These effects are the strongest for children from low-income families, females, and for children with lower-educated parents.

1 Introduction

The Earned Income Tax Credit (EITC) is one of the largest anti-poverty measures in the United States. This tax credit is designed to help low- to moderate-income individuals and families by supplementing their incomes while encouraging work. In 2021, 25 million tax filers received the credit totaling about $60 billion (*EITC Fast Facts* 2022). The average amount of the federal tax credit received in 2021 was about $2,411 (*EITC Fast Facts* 2022). The recipient of the tax credit is not the only person in the household that is affected by the credit. The children of recipients also stand to benefit from these additional resources. Since there is no limit on the number of years that a tax filer can file for this credit, this potentially represents a significant increase in family resources over the duration of childhood, for those who qualify. The additional resources from the tax credit can impact outcomes for the children both during childhood, when the credit is received, as well as outcomes as an adult.

One of the long-term outcomes that may be affected by increased resources from the EITC is entrepreneurship as an adult. This paper tests whether increases in childhood EITC benefits affects the likelihood of becoming an entrepreneur as an adult. The EITC may impact adult entrepreneurship outcomes for the children of the recipients due to how the tax credit is structured. This structure opens two possible pathways for exposure to affect future entrepreneurial outcomes that are in tension with each other: the resource effect

and the demonstration effect. In order to receive the credit, individual must be working. The income from employment as well as the supplemental income from the tax credit will increase family resources, which may affect the attitudes and preferences of the children as well as providing better opportunities for the children which may combine to lead them to avoid entrepreneurship. Another way the design of the EITC can affect entrepreneurial outcomes of the children is that the work requirement attached to the credit can be satisfied through self-employment. A parent may become self-employed in order to receive the benefits of the credit, which will then provide an example of entrepreneurship for the child, potentially increasing their likelihood of becoming an entrepreneur as an adult. This paper will test which of these two effects is the dominant effect of the EITC on future entrepreneurial outcomes.

This paper makes important contributions to the literature on the effects of the EITC. First, I extend the literature on how the EITC affects entrepreneurship and how the EITC affects the outcomes of children, by estimating the impacts of the EITC on the entrepreneurial outcomes of the children of EITC recipients. The existing literature on how the EITC affects entrepreneurship has focused on the entrepreneurial decisions of the recipients. Additionally, the literature on the impacts of the EITC on children has not focused on their adult entrepreneurial outcomes. This paper is able to fill in some of the gaps in both of these important strains of EITC literature.

Second, this paper examines another important outcome that the existing EITC literature has not yet investigated: risk preferences. I use rich survey data which includes measures of childhood risk preferences and test whether increases in the Earned Income Tax Credit impact these measures of risk. Understanding these preferences are important to better understanding future entrepreneurial outcomes because becoming an entrepreneur involves an inherent amount of risk.

Lastly, this paper contributes to the literature by examining whether the timing of increases in the EITC (and therefore family income) matters for long-term entrepreneurial outcomes. I am able to observe the amount of EITC exposure for each individual in my sample during each year of childhood. I use test if there are differing effects on EITC increases by difference age periods to better understand when the EITC has the greatest impact on adult entrepreneurship.

I exploit variation in the timing of EITC policies, changes in family composition, and variation in state policy to create a measure of childhood EITC exposure to test the impact of the Earned Income Tax Credit's effect on the likelihood of the child becoming an entrepreneur as an adult. This measure of EITC exposure is created in the same way as Bastian and Michelmore (2018). EITC exposure is calculated based on when the child is born because this determines which EITC expansions they are subject to, the number of children in the household, and the state of residence since states can also pass their own version of the EITC to supplement the federal credit. This measure of EITC exposure is used instead of actual possible EITC amounts to avoid potential endogeneity between income and the decision to

become an entrepreneur. This is calculated for each year of childhood from birth to age 18, and each year of exposure is summed into a single measure of total childhood exposure. I use this measure to estimate the causal effect of EITC on adult entrepreneurial outcomes.

I use two different outcomes to measure entrepreneurship as an adult: self-employment and business ownership. These outcomes both represent different aspects of entrepreneurship. Self-employment is representative of entrepreneurship-by-necessity, which is often lower productivity and less growth oriented. Business ownership is more akin to entrepreneurship-by-opportunity and is associated with higher productivity projects and is more growth oriented. By using these two outcomes, I am able to test for how the EITC impacts each type of entrepreneurial endeavor.

Results indicate that an increase in the generosity of the EITC does impact entrepreneurship outcomes in adulthood for the children of the recipients. I find that increases in the EITC increase the likelihood of being a business owner, but have no effect on the likelihood of being self-employed as an adult. A $1,000 increase in total EITC exposure increases the likelihood of being a business owner by 2.5-2.8%. The impact of the EITC is strongest for the families with the lowest incomes, who the exact families that are the most likely to be impacted by changes in the EITC policy. Contrary to Bastian and Michelmore (2018) and Braga, Blavin, and Gangopadhyaya (2020), I do not find any impacts of the timing of increases in EITC exposure on adult business ownership.

I also examine whether there are differing impacts for different sub-populations of the sample. I find that increases in EITC exposure increase the likelihood of being a business owner in adulthood for females and for the children of parents without a bachelor's degree. Increasing the total EITC exposure by $1,000 increases the likelihood of owning a business as an adult by 5% and 3%, respectively. The impacts for these sub-populations overlap with the most affected sub-populations in Bastian and Michelmore (2018) and Braga, Blavin, and Gangopadhyaya (2020).

I then explore some possible mechanisms for how the EITC may affect future entrepreneurship. I first test whether there is a demonstration affect by focusing on the adult outcomes of children who have entrepreneurial parents. I do not find any evidence for a demonstration effect from the EITC. Next I explore how the EITC impacts the preferences for risk since risk tolerance is a determinant of entrepreneurship. I do find that increased resources reduces the likelihood of having a higher preference for risk. A $1,000 increase reduces the likelihood of higher risk tolerance by 0.95%. Here I do find difference impacts by the age of EITC exposure. Reductions are greater for increased exposure during the ages 13 to 18. These results combined with the previous results for the children of entrepreneurs and the results on self-employment as an outcome suggest that the resources effect is the dominant effect.

This paper provides further evidence for the positive impacts of the EITC on children from low-income families in addition to the adult recipients. These findings have important

implications for entrepreneurial policy suggesting that the additional resources provided by the EITC improves the likelihood of higher-quality entrepreneurship in adulthood. These results may have important implications for intergenerational inequality as I find the largest effects for the children from the lowest income families.

The rest of the paper proceeds as follows. Section 2 reviews the relevant previous literature. Section 3 describes the data and the construction of the final sample. Section 4 outlines the empirical methodology. Section 5 presents the main results of the paper, including potential mechanisms, and section 6 concludes.

2 Previous Literature

There exists a growing literature on the effects of the EITC on children of recipients. Much of this literature focuses on the contemporaneous effects receiving the credit. One of the effects researchers have examined is how the EITC affects student achievement outcomes. Dahl and Lochner (2012) wanted to estimate the effect of changes in family income on the educational outcomes of the children. However, changes in family income are often endogenous with student achievement. For example an increase income could change parenting behavior or the amount of time the parent is able to spend with children, affecting scholastic achievement. To overcome this endogeneity issue the authors use policy changes in the EITC as an instrument for changes in family income. The change in policy from the 1993 expansion to the 1997 expansion amounted to a $2,100 increase in payments. They find that a $1,000 increase in EITC benefits received causes a 6% increase of a standard deviation in math and reading scores (Dahl and Lochner 2012). This is an important impact of expansions of the EITC, but this is only a short term effect. From this research we do not know how the EITC affect children over the long term. My research will contribute to the literature by examining different outcomes for the children of families who receive the EITC as well as examining the long term impacts of the EITC on children.

The EITC has been used to estimate the effects of increases in cash-on-hand on college enrollment as well (Manoli and Turner 2018). The idea behind the cash-on-hand hypothesis is that families with more available family funds around the time that college enrollment decisions are made (spring of the senior year of high school) will increase the number of enrollees. Instead of using expansions of the federal EITC policy Manoli and Turner (2018) take advantage of how the EITC credit is structured. They use the nonlinearities in the credit structure to estimate how increases in cash-on-hand, via increases in the EITC around the kink, affects subsequent college enrollment. They find that increase in the EITC also induces a 1.3% increase in the likelihood of enrolling in college for children in the spring semester of their senior year of high school (Manoli and Turner 2018). This again is an educational outcome, but education is potentially one of the mechanisms that affects risk preferences and entrepreneurial behavior.

Contemporaneous health outcomes of the children of benefit recipients are also impacted by the EITC. One of the standard measures of infant health is the incidence of low birth weight. This measure is highly predictive of longer term adult health and economic outcomes.

The 1993 expansion of the EITC reduced the incidence of the low infant birth weight by 0.17-0.31 percentage points, a 1.6-2.9% decline in th population Hoynes, Miller, and Simon (2015). This shows that the impacts of the EITC are not just economic, but that they affect health as well and may also affect different behavioral patterns as well such as preference for risk. The current work will also utilize EITC expansions as well as other sources of variation in EITC benefits such as family composition.

While much of the research on the effects of the EITC on children of the recipients focuses on contemporaneous effects, research is beginning to examine longer term effects. The EITC has been shown to increase the likelihood of graduating high school, completing college, and being employed as an adult (Bastian and Michelmore 2018). Bastian and Michelmore (2018) also find that increased exposure to the EITC also increases adult earnings 2.2%. They divide the childhood into different sub-periods and find that increases in EITC during the teenage years is more important that increases in earlier periods of childhood. This is consistent with the cash-on-hand hypothesis of Manoli and Turner (2018). The EITC also has long term impacts on the health of children of recipients. A 3% increase in EITC exposure increases the likelihood of reporting being in good health and decreases obesity by 4.1% as an adult (Braga, Blavin, and Gangopadhyaya 2020) My work will contribute to this growing literature on the long term effects of the EITC on children of recipients and similar to Bastian and Michelmore (2018) I will also examine when in childhood are increases in EITC benefits the most beneficial.

The impacts on the recipients of the EITC are also important to consider, since these effects can be a mechanism that affect the children as well. The EITC increases the labor supply of single mothers, potentially meaning that less time is being spent with their children (Eissa and Liebman 1996; Meyer and Rosenbaum 2001; Schanzenbach et al. 2020). This could then impact the child's preferences for risk and the likelihood of future entrepreneurship.

The EITC can also increase self-employment. Given the design of the tax credit, expansion in generosity is predicted to increase the amount of reported self-employment income in the phase-in region and decrease it on the phase-out region. Given the way the EITC is structured, people use self-employment to maximize the amount of credit they receive (Saez 2010). Both LaLumia (2009) and Chetty, Friedman, and Saez (2013) find that the EITC increases self-employment. Expansions in federal EITC policy increases the likelihood of reporting self-employment income for unmarried filers by 3.2% and by 4.1% for married filers (LaLumia 2009). This shows that the EITC does increase entrepreneurship for those who receive the credit which may also affect the entrepreneurial behaviors of the children. Chetty, Friedman, and Saez (2013) use changes in family composition as their identification strategy to show that in areas with more EITC filers individuals increase their reported self-employment income relative to areas with fewer EITC filers. The amount of time spent on self-employment increases for low-income non-college educated married mothers following an increase in state EITC benefits (Lim and Michelmore 2018). This could be another channel through which the EITC affects risk preferences of the children. This shows that differing EITC policies could lead to entrepreneurial hot spots which could spur children to start their

own projects as adults. Instead of focusing on the entrepreneurial decisions of the recipients I will contribute to the literature by focusing on the entrepreneurial decisions of the children of recipients.

Self-employment is one type of entrepreneurship. There are other entrepreneurial outcomes that are also worth considering. In addition to self-employment, I also examine how the EITC affects business ownership because self-employment is associated with entrepreneurship by necessity and is often lower productivity than other types of entrepreneurship (like business ownership). The self-employed are more likely to enter self-employment after experiencing unemployment rather than coming from wage and salary work (Evans and Leighton 1990). Self-employment rates also increase during recessions when wage and salary jobs are more scare and decrease during expansions when they are more plentiful (Fossen 2021). This suggests that those choosing to become self-employed needed to do so because they did not have other wage and salary options. While self-employment is a good way for individuals to continue to work after experiencing unemployment, it may not help spur innovation in the wider economy since these new business are of lower productivity (Fossen 2021). Further, those who went into self-employment experience a lower drop in earnings than those who end their unemployment spell by returning to wage and salary work (Evans and Leighton 1990) also shows that these endeavors are not as productive as other opportunities. This can create adverse selection in who becomes self-employed versus those business owners that are both more productive and hire more employees, contributing more to overall growth (Belitski and Korosteleva 2010; Burke, Lyalkov, and Millán 2021). By examining both types of outcomes, I am able to test which type of entrepreneurship the EITC encourages.

This work also contributes to the literature on the determinants of entrepreneurship. One of the largest factors for why an individual becomes and entrepreneur is whether or not they have entrepreneurial parents. While this is widely known and accepted, the origins of such behavior are not known. Using Swedish adoption records, which contain information on the child and all four parents, Lindquist, Sol, and Van Praag (2015) find that the likelihood of a child becoming an entrepreneur increases by about 60% if one of their parents is an entrepreneur. Taking advantage of their unique data, they show that pre-birth factors are important in becoming an entrepreneur, but that post-birth factors are twice as important (Lindquist, Sol, and Van Praag 2015). This shows that the modeled behavior is important in becoming an entrepreneur, and suggests that the increase in likelihood of parents due the the EITC could be an important determinant for the entrepreneurship of the child. Exposure to innovation is also an important determinant of who becomes and inventor. Growing up in a high-innovation area increases the chance of a child becoming an inventor later in life (Bell et al. 2019). Risk preferences are also an important determinant of becoming an entrepreneur and a two standard deviation in the willingness to take risks increases the probability of being self-employed by 5-6% (Skriabikova, Dohmen, and Kriechel 2014). While this is obvious it is difficult to test because of confounding environmental factors such as parental entrepreneurship. Skriabikova, Dohmen, and Kriechel (2014) use a sample of the Ukrainian population whose parents grew up during the Soviet period because entrepreneurship was banned. With no entrepreneurial role models for parents, the effect of risk could be isolated.

The labor market conditions of a location also influence the behavior of entrepreneurs and would-be entrepreneurs. When there is high wage and salary volatility, more people become self-employed because people want to minimize the amount of risk that they face in the labor market (Low and Weiler 2012). The EITC may change the risk preferences of individuals as well which would then influence subsequent entrepreneurship.

3 Data and Sample

Data come from the National Longitudinal Survey of Youth 1979 (NLSY79) sample. The NLSY79 is a nationally representative sample of non-institutionalized individuals who were ages 14 to 22 in 1979. The original sample of individuals has been followed and surveyed annually through 1994 and biannually thereafter. The sample originally included 12,686 young men an women, and there are currently 9,964 eligible respondents remaining in the survey. Beginning in 1986, a supplemental survey, the National Longitudinal Survey of Youth 1979 Child and Young Adult (NLSYCYA), was conducted to gather information on all children born to women in the NLSY79. As of the latest round of the survey there were 11,545 children born mothers from the NLSY79. These data from NLSYCYA combined with the NLSY79 contain a rich set of information on individual and family characteristics, which are used to calculate the annual exposure to the EITC.

I limit the sample to the children of mothers from NLSY79 who are at least age 25 by 2016, which is the age at which outcomes are first measured. The sample is further restricted to the children who are observed throughout childhood up to age 18 with full information for the children and their mothers. These restrictions reduce the sample to 1,904 individuals born between 1984 and 1991.

Summary statistics are presented in table 1. All dollar values are adjusted for inflation with the Consumer Price Index and reported in 2016 dollars. The mothers of the individuals in the sample have completed some college average which is a similar level of average educational attainment for the individuals themselves. Most of the individuals grew up in households with married parents and have an average of 1.7 siblings. About 12% of individuals in the sample have a mother who considers themselves an entrepreneur and around 13% have a parent who owns a business. The average cumulative maximum EITC benefits from a child's birth to age 18 were approximately $34,000. On average, individuals were exposed to greater EITC benefits between the ages 13 and 18 ($15,479) than between birth and age 5 ($4,101). This disparity is partially explained by the fact the largest expansions of the EITC occurred after the majority of the sample turned 5. Only the very youngest individuals in the sample would have been under 5 during the largest expansions in the early 1990s. Another contributing factor in the difference in maximum EITC exposure between 0-5 and the older age groups is that children under 6 are less likely to have other siblings in the household. Approximately 35% of the 0-5-year-olds in my sample have no other siblings in the household, compared to around 21% of 6-12-year-olds. The 13-18 year-olds are about as likely to have no other siblings in the households, but are more likely to have at least another sibling in the household.

Table 1: Descriptive Statistics of Sample

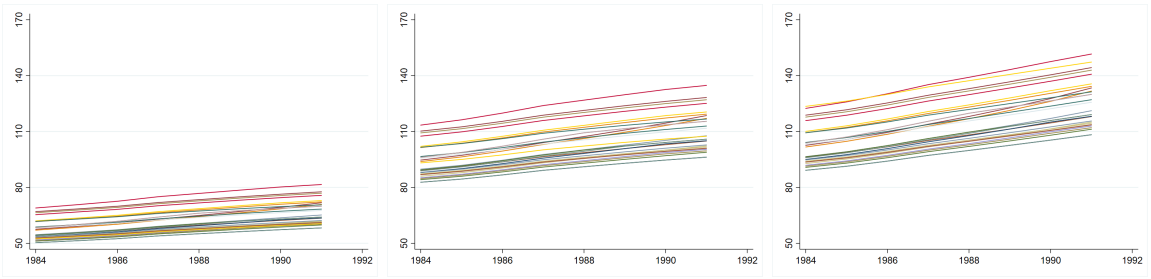
Variable	Mean	Std. Dev.
Female	0.514	0.5
Black	0.261	0.439
Hispanic	0.208	0.406
Siblings	1.7	1.168
Highest Grade Completed	13.444	2.211
Parents Married	0.651	0.477
Mother's Highest Grade Completed	13.973	2.471
Parent Business Owner	0.132	0.339
Parent Entrepreneur	0.122	0.328
Total EITC Exposure ($000s)	33.999	7.835
EITC Exposure Age 0-5 ($000s)	4.101	1.973
EITC Exposure Age 6-12 ($000s)	14.418	4.082
EITC Exposure Age 13-18 ($000s)	15.479	3.374
Observations	1904	

Children born between 1984 and 1991 who meet the following criteria: observed each wave of the National Longitudinal Survey of Youth Child and Young Adult between the ages 0 and 18, turn 25 by 2016, have full information for each of the controld variables including the risk assessment. All dollar measures are in 2016 dollars. Earned Income Tax Credit (EITC) exposure is defined as the maximum potential federal and state EITCa household could receive, given the year, state, and number of children in the household.

4 Empirical Methodology

To analyze how the EITC affects entrepreneurial outcomes as an adult, I follow the methodology of Bastian and Michelmore (2018) and create a measure of EITC exposure during childhood. EITC exposure is defined as the maximum potential federal and state credit that the child's family could receive given the tax year, state of residence, and number of children in the household. This calculation was made independent of parental marital status or actual family income. The total amount of EITC exposure is summed, for each individual, from an individual's birth until they turn 18 or the last year they reside in the parents' household, whichever comes first. The amount of EITC exposure each individual receives is not constant over time due to state and federal EITC policy changes, changes in family composition, as well as moving across state lines. As an example, an individual who is the firstborn child in a household will have the maximum federal and state EITC available for a household in the year in which there were born and in the state that they were born. In the next year, if a sibling enters the household, both children will be assigned the maximum federal and state EITC possible for a two-child household in that state after the birth of the second child. This will remain the case, as long as the family size does not change, until the first child turns 19. At that point, the second child will be assigned the maximum federal and state EITC available for that year, in that state for a one-child household until they turn 19 or leave the household, whichever comes first.

Figure 1: Maximum Federal + State EITC Benefits (1000s of 2016 Dollars)



(a) (b) (c)

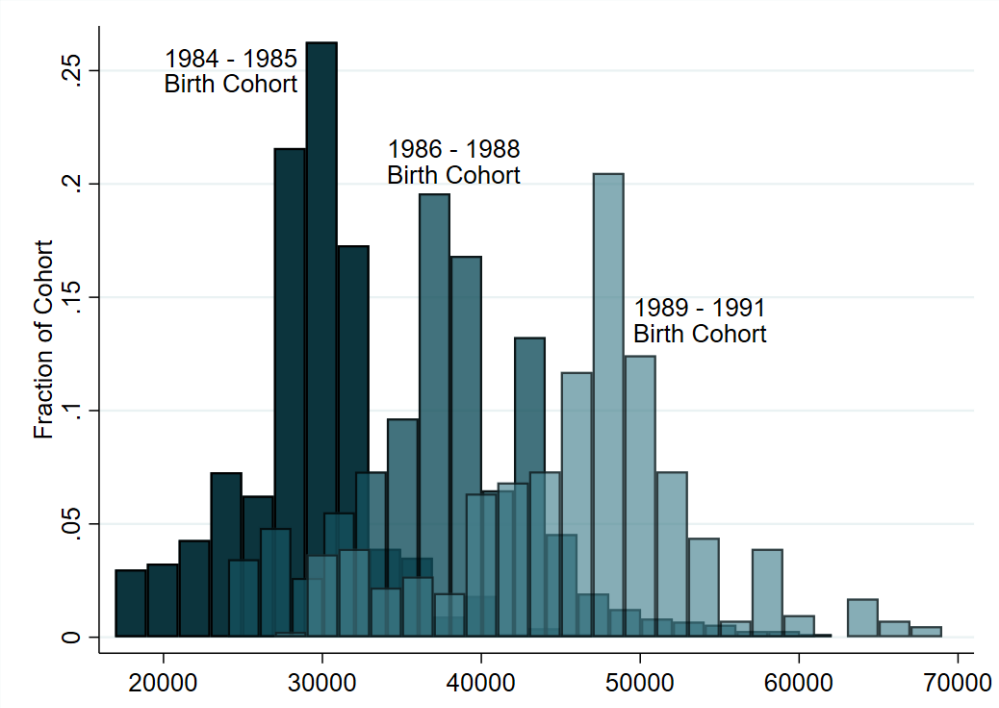
Maximum possible federal and state Earned Income Tax Credit exposure possible from birth to age 18 by birth year and state. EITC exposure is defined as the maximum potential federal and state EITC an individual could receive in a given year and state for a one- (a), two- (b), or three-plus-child (c) household. The lowest line in every panel represents the maximum federal EITC exposure for states with no state-level policy

There are three main sources of variation in maximum potential EITC exposure: the year the individual was born, the state in which the individual was lives, and the number of children in the household. The year of birth determines the amount of federal EITC credit to which the individual is exposed based on expansions of the federal policy. While there are policy changes in the state level EITC policies, those changes are much smaller than the impact of the federal expansions the EITC undergoes over time. The state of residence of the individual determines whether there is a supplemental state-level credit that the family could have received. Lastly, the number children determines the maximum amount the household is eligible for since the credit becomes more generous with more children living in the household.

This measure of EITC exposure is used, instead of actual EITC benefits for which the family is eligible to avoid concerns of endogeneity between family income and actual EITC benefits with respect to entrepreneurial outcomes. To be eligible for the EITC, families must have an income below a certain threshold, which was $53,505 in 2016. Thus, income in negatively correlated with EITC eligibility. Individuals with higher levels of EITC benefits are likely to be disadvantaged in other ways too, which may affect their future entrepreneurial decisions. They may live in worse neighborhoods, attend worse schools, grow up in single parent households, worse nutrition, which all may affect their decision and need to become an entrepreneur. So increases in actual EITC benefits, will likely also reflect changes in some of these other disadvantages as well. Using the EITC exposure during an individual's childhood rather than the actual EITC benefits for which the family is eligible, will help isolate the plausibly exogenous policy variation and exclude the endogenous variation in EITC eligibility.

Figure 1 simulates the variation in EITC exposure a child could potentially receive from birth to age 18 by birth year, state, and the number of children in the household. This was constructed by summing the maximum amount of federal and state EITC available in each year since birth to age 18 for each of the states that have a state-level policy as well

Figure 2: Total EITC Exposure from Birth to 18 (2016 Dollars)



Distribution of total EITC exposure from birth to age 18. EITC exposure is shown in 2016 dollars and is defined as the maximum potential federal and state EITC an individual could have received in a given year, state, and number of children in the household. The histogram reflects 694 unique values for 1904 individuals.

as just the federal EITC amounts for the states without such a policy (the bottom line in each panel) for the households with one, two or three-plus children. The figure shows what EITC exposure would look like for children born between 1984 and 1991 if they lived in a one-, two-, or three-plus-child household for their entire childhood assuming that they never move out of their state of birth. The results of this exercise demonstrate that there is substantial variation in the amount of EITC exposure, depending on birth year and state of residence. Individuals born in 1984 could have been exposed up to about $69,000 for a one-child household and up to $123,000 for a three-plus-child household. For children born at the end of the sample these values increase to over $81,000 and $151,000 respectively.

Figure 2 shows how the simulated variation in EITC exposure translates into actual EITC exposure between birth and age 18 for the sample. Figure 2 represents nearly 700 unique values of EITC exposure for the sample of 1904 individuals and reflects any changes in household size as well as any cross-state moves an individual experiences between birth and age 18. There is wide variation in the amount of EITC exposure which is consistent with the simulated values represented in figure 1. The variation in figure 2 ranges from less than $17,000 for individuals born between 1984 and 1985 and over $68,000 for individuals born between 1989 and 1991. Since there is a work requirement attached to the receipt of the EITC, these individuals also experienced increases in family earnings in addition to the tax

credit. As a result, the EITC had a large impact on household resources for many of the children growing up in low-income families over this time period.

To analyze the effect of the EITC on entrepreneurial outcomes, I estimate the reduced-form effect of increasing EITC exposure during childhood on adult entrepreneurial outcomes. The EITC has the potential to affect adult entrepreneurial outcomes through two possible avenues. One possible path for childhood EITC benefits to affect future entrepreneurship is by increasing the amount of resources available for the family. This "resource effect" may reduce the child's preference for risk and allow for more productive opportunities, decreasing the likelihood of future entrepreneurship. An alternative path for the EITC to affect future entrepreneurship is through the entrepreneurial decisions of the parents. Since one of the ways to satisfy the work requirement of the EITC is through self-employment, increases in EITC may induce more parents to become entrepreneurs themselves, which provides an example of entrepreneurship for their children. This "demonstration effect" would increase the child's likelihood of future entrepreneurship. If the resource effect dominates, then increasing EITC exposure during childhood will reduce the likelihood of future entrepreneurship. If the demonstration effect dominates, I would expect the opposite. To test these hypotheses, I estimate the following:

$$Y_i = \beta_0 + \beta_1 EITC_i + \gamma X_i + \psi V_s + \pi Z_s + \eta W_t + \epsilon_i \tag{1}$$

where i indexes individuals, s indexes states, and t indexes years. Here Y_i is the outcome of interest: the individual has ever been self-employed, and the individual has ever been a business owner. All outcomes are measured at age 25 and at age 35. Using both 25 and 35 for measuring allows me to assess whether the EITC has a more immediate impact on becoming an entrepreneur or if it impacts entrepreneurship in later adulthood. Later adulthood is of interest because most successful entrepreneurs become an an entrepreneur at about age 45 (Azoulay et al. 2020). Since only the absolute oldest individuals initially in the NLSYCYA would be 45 in 2016, I focus on outcomes at age 35. By using both self-employment and business ownership, I will be test for differences in types of entrepreneurship. While both measures are similar, there are important differences. Self-employed individuals are more likely to be less growth oriented, not as productive as employer firms, and more likely to be entrepreneurs out of necessity than opportunity. Individuals who report owning a business are more likely to have employees, be more growth oriented than a sole proprietorship, and are more likely to be entrepreneurs of opportunity that self-employed individuals. β_1 is the coefficient of interest, which represents the impacts of an additional \$1,000 of EITC exposure during childhood on subsequent entrepreneurial outcomes.

The term X_i represents a vector of personal characteristics that includes parental marital status at age 18, highest grade completed by the mother, number of siblings at age 18, marital status at age of entrepreneurship, indicators for female, black, Hispanic, homeownership at entrepreneurship and health insurance at age of entrepreneurship, birth year fixed effects, and entrepreneurship year fixed effects. These controls account for changes in entrepreneurship over time that vary by race, gender, individual and family characteristics that correlate with future entrepreneurship.

Table 2: Effect of Earned Income Tax Credit (EITC) Exposure on Self-Employment

	(1) Self-Employed by Age 25	(2) Self-Employed by Age 25	(3) Self-Employed by age 35	(4) Self-Employed by age 35
Total EITC Exposure ($000s)	-0.00147		-0.00154	
	(0.00130)		(0.00126)	
EITC Exposure Age 0-5 ($000s)		-0.0106		-0.0128
		(0.0196)		(0.0187)
EITC Exposure Age 6-12 ($000s)		0.00381		0.00393
		(0.00509)		(0.00430)
EITC Exposure Age 13-18 ($000s)		-0.00357		-0.00362
		(0.00314)		(0.00289)
Observations	1904	1904	1904	1904
R^2	0.115	0.116	0.375	0.375

EITC exposure is defined as the maximum potential federal and state EITCa household could receive, given the year, state, and number of children in the household. Results reflect the estimation of equation (1) and include demographic controls; state-year controls at the age of self-employment; indicators for state of residence at time of self-employment, year of birth, and year of self-employment; and state-specific quadratic time trends. For individuals that did not become self-employed, control variables are taken at the average age of self-employment. Standard errors (in parentheses) are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$

The term V_s is a vector of state-by-year policy and economic variables such as state per capita GDP, state minimum wage, and state unemployment rate. Each variable is measured at the time the individual first becomes an entrepreneur. For the individuals who never become entrepreneurs, these variables are measured at the average age at which the entrepreneurs in the sample become entrepreneurs [1]. These controls are to account for the economic and policy environment which may influence the individual's decision to become an entrepreneur. State-specific time trends are also included to account for further unaccounted for policies or conditions that vary by state across time. The terms Z_s and W_t are indicators for the state and the year in which the individual may become an entrepreneur, respectively, and ϵ_i is an idiosyncratic error term. To account for unobserved correlation of the error terms within states, standard errors are clustered at the sate level.

5 Results

5.1 EITC Exposure and Adult Entrepreneurship

Table 2 presents the results from estimating the effect of childhood EITC exposure on whether the individual becomes self-employed as an adult. This outcome is measured at both age 25 (columns 1 and 3) and at age 35 (columns 2 and 4) to allow for the possibility of entrepreneurship in early adulthood and later in adulthood. Columns 3 and 4 divide total EITC exposure in to exposure for three different age brackets: 0-5, 6-12, and 13-18. This is done to test whether there is a differential effect of the timing of EITC exposure on adult self-employment.

[1] The median age of entrepreneurs was also tested, but the median age of entrepreneurship was not significantly different from the mean age.

Table 3: Effect of Earned Income Tax Credit (EITC) Exposure on Business Ownership

	(1) Business Owner by age 25	(2) Business Owner by age 25	(3) Business Owner by age 35	(4) Business Owner by age 35
Total EITC Exposure ($000s)	0.00310**		0.00327**	
	(0.00139)		(0.00136)	
EITC Exposure Age 0-5 ($000s)		0.0154		0.0174
		(0.0316)		(0.0317)
EITC Exposure Age 6-12 ($000s)		0.00707		0.00644
		(0.00647)		(0.00638)
EITC Exposure Age 13-18 ($000s)		0.000525		0.000985
		(0.00252)		(0.00241)
Observations	1903	1903	1903	1903
R^2	0.106	0.107	0.251	0.252

EITC exposure is defined as the maximum potential federal and state EITCa household could receive, given the year, state, and number of children in the household. Results reflect the estimation of equation (1) and include demographic controls; state-year controls at the age of business ownership; indicators for state of residence at time of business ownership, year of birth, and year of business ownership; and state-specific quadratic time trends. For individuals that did not become business owners, control variables are taken at the average age of business ownership. Standard errors (in parentheses) are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$

Results suggest that there is little effect of total EITC exposure on the likelihood of future self-employment. Increasing total EITC exposure during childhood reduces the likelihood of self-employment at both age 25 and 35, but neither result is statistically significant. Similarly, in columns 3 and 4, I find little effect of increasing EITC exposure during specific points in childhood. None of the coefficients on the EITC exposure variables are statistically significant from 0. These results suggest that increasing EITC exposure at different developmental stages has no effect on future self-employment.

These results imply that there is not much evidence of the "demonstration effect" for an increase in childhood EITC exposure. The demonstration effect hypothesis is that increases in EITC induces the parents to become self-employed to satisfy the work requirement attached to the EITC. This increase in self-employment by the parents, in turn, provides an example for the children and increases their likelihood of becoming self-employed as adults. For the results to be consistent with this hypothesis, the coefficient on EITC exposure would need to be significantly greater than 0. I instead find no increase in adult self-employment. It is possible that the demonstration effect exists for some individuals, but the "resource effect" for other individuals erases some of those effects on average. Since it is unclear which effect is present from these results, I further test the impacts of increased EITC exposure on the risk preferences of the child in section 5.2.

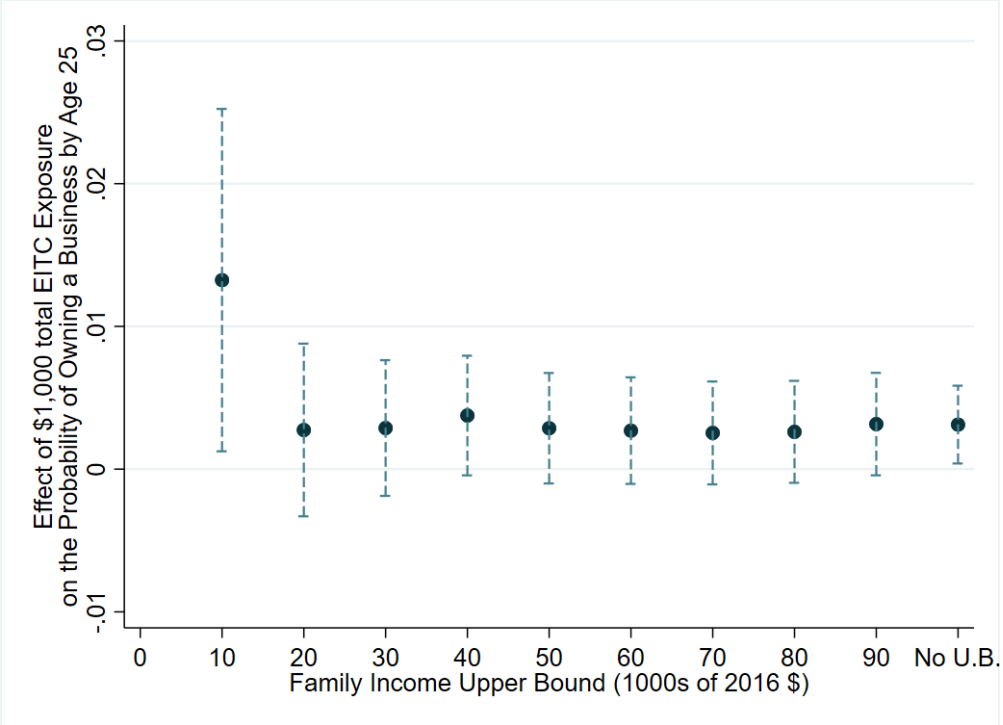
Table 3 presents the results for the other outcome of interest: whether an individual was ever a business owner. This is again measured at age 25 (columns 1 and 3) and at age 35 (columns 2 and 4) and total EITC exposure is divided into different periods of childhood (columns 3 and 4) to allow for differences in the timing of additional exposure.

Results suggest that childhood exposure to the EITC does impact future business ownership. Columns 1 and 2 show that total EITC exposure is more important for future business ownership than increases in EITC exposure during specific points in childhood (columns 3 and 4). A $1,000 increase in total EITC exposure increases the likelihood of future business ownership at age 25 by 0.31 percentage points (or 2.8%). For business ownership by age 35, the effect of increased EITC exposure is similar: a $1,000 increase in total EITC exposure increases the likelihood of being a business owner by age 35 by 0.327 percentage points (or 2.5%). Columns 3 and 4 test for the effect of increases in EITC exposure by different points in the individual's childhood: ages 0-5, 6-12, and 13-18. I find that the timing of the increases in EITC exposure does not impact future business ownership. None of the coefficients on EITC by age group are statistically significant for either business ownership by age 25 or by age 35.

To ensure that these results are not being driven by children from higher income families that were not eligible for the EITC, I estimate the effect of total EITC exposure on business ownership by age 25 [2] for different maximum incomes. Since I am using the total potential childhood exposure from birth to age 18, I average the family income for each individual from birth to age 18 instead of using a the family income from a single year. Figure **??** shows that the effect of an additional $1,000 of EITC exposure is strongest for individuals from the most disadvantaged families. This suggests that the children from the lowest-income household benefit the most, in terms of owning a business in the future, from EITC expansions.

The effect of EITC exposure on business ownership is different for different subset of the full sample. Table 4 shows the results for various subgroups: males, females, black individuals, Hispanic individuals, children whose parent was an entrepreneur, children whose parent was a business owner, children with parents without a BA, and children of unmarried parents. Using the full set of controls, estimates show the effect of an addition $1,000 of total EITC exposure on the likelihood of owning a business by age 25 (panel A) and by age 35 (Panel B). Results indicate that the effect of additional EITC exposure during childhood is greater for females. A $1,000 increase in exposure increases the likelihood of being a business owner by age 25 by about 0.46 percentage points (or 5%) for females. The effect is similar for becoming a business owner by age 35 as well (0.4 percentage points).This effect is much larger than the effect for males despite having similar levels of exposure for both groups (about $35,800 and $ 36,200 respectively). Results are also larger for individuals with parents with the least amount of education where the least amount of education is defined as not having a bachelor's degree. Increasing EITC exposure by $1,000 for individuals with parents without a bachelor's degree are 0.31 percentage points (about 3%) more likely to be a business owner by age 25 and 0.34 percentage points (2.8%) more likely to own a business by age 35. This result shows that expansions in the EITC do positively impact future business ownership by children from parents without college degrees, who are more likely to be affected by these expansions than those with at least a bachelor's degree.

[2] This exercise is repeated for business ownership by age 35 without any meaningful difference in the results. This figure can be found in the appendix



Earned Income Tax Credit (EITC) exposure has the largest effect for individuals from low-income families. Each point represents the estimate of the effect of a $1,000 of EITC eposure on the likelihood of becoming a business owner by age 25 from a seperate ordinary least squares regression. EITC exposure is shown in thousands of dollars and is defined as the maximum potential federal and state EITC a household could receive, given the year, state, and number of children in the household. Regressions include demographic controls; state-year controls at the age of business ownership; indicators for state of residence at time of business ownership, year of birth, and year of business ownership; and state-specific quadratic time trends. For individuals that did not become business owners, control variables are taken at the average age of business ownership. Vertical bars represent 95% confidence intervals. Standard errors are clustered at the state level.

5.2 Mechanisms

The results above suggest that increasing the amount of Earned Income Tax Credit to which a child is exposed to has a positive impact on their future business ownership. It does not appear to have a similar impact on future self-employment. I explore some mechanisms which may result in these differences and whether the demonstration effect or the resource effect is driving the above results. Table 5 tests directly whether there is an increase in business ownership from increased total exposure if the child's parents are entrepreneurs. I analyze the effect of the EITC for two new subgroups: children whose parents consider themselves entrepreneurs and child whose parents own a business. All regressions include a demographic, family, and state controls as well as indicator variables for state, year, cohort, and state time trends.

For the children whose parents consider themselves an entrepreneur, the results in table 5 show the EITC did not have a substantial impact. There is not a statistically significant effect of increasing childhood EITC exposure on owning a business by age 25 or by age 35. Similarly, the EITC does not have a substantial impact on owning a business for the sub-sample of individuals whose parents own a business. I again, find no statistically significant effects of increasing childhood EITC exposure on business ownership by both age 25 and by age 35.

These results imply that there is not much of a demonstration effect for owning a business as an adult. If there were a demonstration effect present, I would expect see a positive and significant increase in the likelihood of owning a business as an adult from an increase in EITC exposure for these sub-samples. Other evidence in favor of the demonstration effect would be that the estimated effect would be larger for these sub-groups. I however find smaller effects for both groups and a negative effect for the individuals whose parents are business owners, though no results are statistically significant. These results are contrary to what Lindquist, Sol, and Van Praag (2015) find. They find that parental entrepreneurship increases the probability of the children's entrepreneurship. The difference in outcomes could stem from this paper's focus on the effects of the EITC on entrepreneurship whereas Lindquist, Sol, and Van Praag focus solely on the entrepreneurship of the parents and do not have an intermediary effect which influences the entrepreneurial decisions of the children.

Table 4: Business Ownership by sub population

	(1) Female	(2) Male	(3) Black	(4) Hispanic	(5) Least Educated Parents	(6) Single Parent
Panel A: ...by 25						
Total EITC Exposure ($000s)	0.00456**	-0.000298	0.00112	0.00428	0.00310*	0.00255
	(0.00182)	(0.00231)	(0.00282)	(0.00335)	(0.00154)	(0.00200)
Dep. var. mean	0.0859	0.139	0.109	0.0682	0.104	0.0887
Mean EITC exposure	35.8	36.2	34.9	35.6	35.0	34.6
Observations	978	925	497	396	1352	665
R^2	0.206	0.160	0.196	0.271	0.130	0.247
Panel B: ... by 35						
Total EITC Exposure ($000s)	0.00399**	0.000275	0.000955	0.00500	0.00338**	0.00233
	(0.00175)	(0.00204)	(0.00280)	(0.00335)	(0.00143)	(0.00195)
Dep. var. mean	0.100	0.161	0.119	0.0909	0.121	0.102
Mean EITC exposure	35.8	36.2	34.9	35.6	35.0	34.6
Observations	978	925	497	396	1352	665
R^2	0.321	0.294	0.294	0.463	0.267	0.361

EITC exposure is defined as the maximum potential federal and state EITC a household could receive, given the year, state, and number of children in the household. Results reflect the estimation of equation (1) and include demographic controls; state-year controls at the age of business ownership; indicators for state of residence at time of business ownership, year of birth, and year of business ownership; and state-specific quadratic time trends. For individuals that did not become business owners, control variables are taken at the average age of business ownership. Least educated parents is defined as the parent not having obtaing a bachelor's degree. Standard errors (in parentheses) are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$

I also investigate whether there is evidence of a resource effect. To test for a resource effect, I test whether increases in childhood EITC exposure affects the preferences for risk of the child. Becoming an entrepreneur is a risky endeavor because it requires the entrepreneur to shoulder most of the risk associated with a new start-up while forgoing the relative security of wage and salary work. Increases in EITC exposure as a child may affect the preference for risk which will affect the likelihood of future entrepreneurship. There is evidence that higher socioeconomic status individuals have a lower preference for risk (Falk et al. 2021), so increasing the family resources through the EITC may reduce the child's taste for risk. To test this empirically, I estimate:

$$Risk_i = \beta_0 + \beta_1 EITC_i + \gamma X_i + \pi Z_s + \eta W_t + \epsilon_i \tag{2}$$

Where $Risk_i$ is an indicator for whether the individual has a high preference for risk or a low preference for risk. There is a risk assessment included in the NLSYCYA, which is administered to each individual. It asks six different questions to assess the individual's attitudes towards risk and includes items such "I often get in a jam because I do things without thinking" and "I enjoy taking risks" [3]. For each item, the individual must state how much they agree or disagree with the statements on a four point scale. I then average each of these individual scores and then divide the averages in to higher preference for risk or lower preference for risk [4] and use this as my dependent variable. The coefficient of interest is β_1 and it represents the impact of a $1,000 increase in EITC exposure during childhood on the likelihood of having a higher preference for risk. I also divide EITC exposure into different developmental periods of childhood to test whether the timing of the exposure affects the individual's preference for risk.

The term X_i represents a vector of personal and family characteristics which includes parental marital status, the number of siblings, if their parent considers themselves to be an entrepreneur, if their parent owns a business, as well as indicators for female, black, Hispanic and year of birth. Z_s and W_t are indicators for state of residence at the time of the assessment, and the year that the assessment was administered respectively. I also include state specific linear and quadratic time trends. Standard errors are again clustered at the state level to account for unobserved correlation of the error terms within states.

Table 6 presents the results from estimating the effect of childhood EITC exposure on whether the individual has a high taste for risk. Column 1 presents the results for total EITC exposure while column two divides total EITC exposure into exposure during three different age categories: 0-5, 6-12, and 13-18.

The results in table 6 suggest that increasing childhood exposure does impact the individual's preference for risk. Column 1 shows that increases in the total amount of exposure is important for determining the likelihood of having a greater tolerance for risk. A $1,000

[3] The full battery of questions can be found in the appendix

[4] I also perform an ordered probit and ordered logit specifications using the four point scale and achieve similar results. These results can be found in the appendix.

Table 5: The Effect of the Earned Income Tax Credit (EITC) on Business Ownership for Children with Entrepreneurial Parents

	(1) Parent Entrepreneur	(2) Parent Business Owner
Panel A: ...by 25		
Total EITC Exposure ($000s)	0.000829	-0.00359
	(0.0111)	(0.00744)
Dep. var. mean	0.137	0.147
Mean EITC exposure	37.17	36.90
Observations	233	252
R^2	0.447	0.494
Panel B: ... by 35		
Total EITC Exposure ($000s)	0.00174	-0.00359
	(0.0114)	(0.00744)
Dep. var. mean	0.155	0.171
Mean EITC exposure	37.17	36.90
Observations	233	252
R^2	0.506	0.552

EITC exposure is defined as the maximum potential federal and state EITC a household could receive, given the year, state, and number of children in the household. Results reflect the estimation of equation (1) and include demographic controls; state-year controls at the age of business ownership; indicators for state of residence at time of business ownership, year of birth, and year of business ownership; and state-specific quadratic time trends. For individuals that did not become business owners, control variables are taken at the average age of business ownership. Standard errors (in parentheses) are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$

Table 6: The Effect of the Earned Income Tax Credit (EITC) on Risk Preferences

	(1) High Risk	(2) High Risk
Total EITC Exposure ($000s)	-0.00573***	
	(0.00207)	
EITC Exposure Age 0-5 ($000s)		-0.0410
		(0.0439)
EITC Exposure Age 6-12 ($000s)		0.00325
		(0.0117)
EITC Exposure Age 13-18 ($000s)		-0.00817*
		(0.00409)
Observations	1903	1903
R^2	0.110	0.110

EITC exposure is defined as the maximum potential federal and state EITC a household could receive, given the year, state, and number of children in the household. Results reflect the estimation of equation (1) and include demographic controls; state-year controls at the age of the risk assessment; indicators for state of residence at time of the risk assessment, year of birth, and year of the risk assessment; and state-specific quadratic time trends. Standard errors (in parentheses) are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$

increase in total EITC exposure reduces the likelihood of having more of a preference for risk by 0.573 percentage points. When compared to the mean, this translates to a 0.95% reduction relative to the mean. Column 2 shows that the timing of the EITC exposure does impact the preferences for risk. A $1,000 increase in EITC exposure during the ages of 13-18 has a greater impact than increases in exposure during other points of childhood. Increasing exposure during this time by $1,000 decreases the likelihood of hiving a higher risk tolerance by 0.817 percentage points (or 1.36%). This effect is even larger than the effect for and increase in total EITC exposure. Increased exposure during the ages 0-5 also decreases the preference for risk, while increases during the ages 6-12 actually increases it, but neither result is statistically significant at conventional levels.

These results are suggestive of there being a resource effect instead of a demonstration effect. Becoming an entrepreneur is riskier than working for another business. This is especially true of lower productivity endeavors which have a lower probability of expansion and security. Many self-employment endeavors fall into this category. These results combined with the previous results for self-employment suggest that one of the ways that childhood EITC exposure affects future entrepreneurship is by reducing the tolerance for risk. Greater family resources impacts the individual's preference for risk, which then reduces the probability of being self-employed in the future. I had previously found no significant impact of EITC exposure on self-employment which is consistent with this resource effect story. While the impacts are not statistically significant, the sign on the coefficient of interest is consistent

with this hypothesis. Owning a business is less risky than being self-employed since the types of businesses that fall into the former category are more productive and stable. Is is also possible that the increased productivity also is able to compensate the individual enough to overcome the associated risk, which is why there is still a positive effect from the increased resources from the EITC on owning a business as an adult.

In all, these mechanisms point to the resource effect being the dominant effect. There is no evidence that increases in EITC affects the likelihood of owning a business for those individuals who have an entrepreneurial parent, and the likelihood of having an greater preference for risk decreases with increased EITC exposure. This suggests that it is the increased family resources during childhood from the EITC that increase the probability of the children becoming business owners as an adult.

6 Conclusion

This paper analyzed the long-term impact of childhood Earned Income Tax Credit exposure on entrepreneurial outcomes for individuals born between 1984 and 1991. Using variation in state and federal EITC benefits by family size over the duration of childhood, results indicate that the EITC significantly increases the likelihood of owning a business as an adult. Increasing the total amount of EITC available to the family by $1,000, increases the likelihood of becoming a business owner by age 25 by 2.8% and becoming a business owner by age 35 by 2.5%. I do not find any significant increases in the likelihood of being self-employed.

I find little evidence that the timing of the increases in the EITC affects adult entrepreneurship. This suggests that the total amount of additional resources available to the child is more important than the timing of the delivery of the resources. While this is different than the existing literature focusing on the other long-term impacts of the EITC, it could be due to the smaller range of birth cohorts used for this study due to the necessary linkages between parents and children. Also, entrepreneurship is an activity that often occurs at older ages, so I measure my outcome variables later in adulthood (25 and 35). It is possible that the youngest individuals in my sample have not fully realized their entrepreneurial outcomes yet. More time may be needed before the effects of the EITC on future entrepreneurship are able to be fully identified.

When examining the mechanisms through which the EITC may be impacting future business ownership, I first test whether there is a demonstration effect. Since the work requirement for EITC eligibility can be satisfied through self-employment, parents who do so may provide an example of entrepreneurship for their children. However, I find that there little evidence of a demonstration effect. Increasing the EITC exposure during childhood for the children of entrepreneurial parents does not increase the likelihood that the children become business owners as adults. I then test if increasing childhood exposure to the EITC affects the child's preferences for risk because becoming an entrepreneur is relatively riskier than being an employee. Increasing total EITC exposure by $1,000 reduces the likelihood of having a greater risk tolerance by 0.95% and increases in exposure during the ages 13-18 reduce

the likelihood even more (1.36%). These results help explain why there is not an increase in the likelihood of self-employment as an adult with increase EITC exposure as a child. The children of EITC recipients do not become self-employed because self-employment is riskier and increases in family resources reduces their taste for risk. This does not appear to impact future business ownership however, which may be because the rewards from business ownership are enough to compensate for the associated risk. These results suggest that the additional resources provided by increases in the EITC are the dominating effect for why there is an observed increase in adult business ownership.

This paper has shown that, in addition to lifting millions of households out of poverty each year, the EITC also improves the long-term outcomes of the children of EITC recipients. The EITC is one of the largest tools available to fight poverty, that distributed an average of $2,411 dollars to over 25 million individuals in 2021 (*EITC Fast Facts* 2022). This paper has shown that in addition to these effects, the EITC helps the children of recipients become business owners as an adult while reducing the likelihood of lower productivity self-employment. This provides further evidence that the EITC helps the current generation as well as improving outcomes for future generations and impacting the broader economy.

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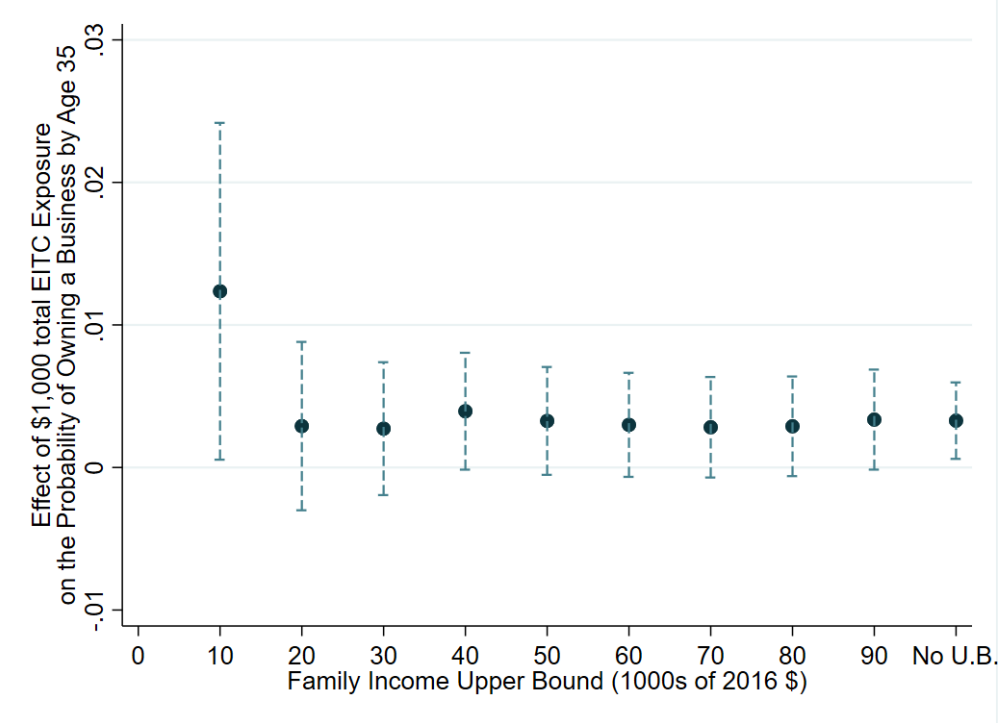
A Appendix



The Effect of the Earned Income Tax Credit (EITC) on Risk Preferences: Ordered Probit and Ordered Logit

	(1) O. Probit	(2) O. Probit	(3) O. Logit	(4) O. Logit
Risk Score				
Total EITC Exposure ($000s)	-0.00871*		-0.0197**	
	(0.00502)		(0.00884)	
EITC Exposure Age 0-5 ($000s)		-0.136		-0.211
		(0.103)		(0.192)
EITC Exposure Age 6-12 ($000s)		0.0181		0.0238
		(0.0271)		(0.0472)
EITC Exposure Age 13-18 ($000s)		-0.0149		-0.0306*
		(0.00959)		(0.0170)
Observations	1903	1903	1903	1903
Pseudo R^2	0.075	0.076	0.078	0.078

National Longitudinal Survey of Youth 1979: Child and Young Adult Risk Assessment

	Strongly Disagree 1	2	3	Strongly Agree 4
I often get in a jam because I do things without thinking				
I think that planning takes the fun out of things				
I have to use a lot of self-control to keep out of trouble				
I enjoy taking risks				
I enjoy new and exciting experiences, even if they are a little frightening or unusual				
Life with no danger would be dull for me				