Does the Earned Income Tax Credit Reduce Housing Instability?

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ABSTRACT

Housing instability (inability to pay rent, frequent moves, moving in with others/doubling up, eviction, or homelessness) is common among low-income households and is linked with a host of negative outcomes for families and children. As rents have risen and wages have not kept pace, housing affordability has declined over the last 15 years, increasing rates of housing instability. Yet, to date, no research has examined whether the Earned Income Tax Credit (EITC), a key US social welfare policy and one of the largest cash transfer programs in the US, reduces housing instability. To address this gap in the literature this study examines whether the EITC is linked with housing instability. Using longitudinal data from the Fragile Families and Child Wellbeing Study (FFCWS) and the Survey of Income and Program Participation (SIPP), we employ a simulated instruments strategy to examine whether policy-induced expansions in the EITC (exploiting federal and state policy variation over time by family size) reduces housing instability. We find that a one thousand dollar increase in the EITC is associated with a 3 to 5 percentage point decline in doubling up (living with at least one adult who is not a nuclear family member). We find some suggestive evidence that the EITC decreases the average number of moves per year (0.5 moves). While our results suggest that the EITC does decrease certain, less severe forms of housing instability, we find no evidence that the EITC decreases more extreme (and rarer) forms of housing instability: eviction or homelessness. Consistent with earlier research, we also find some evidence that the effect of the EITC on doubling up is strongest among families between 50 and 200% of poverty and among mothers with a high school education or some college.

DOES THE EARNED INCOME TAX CREDIT REDUCE HOUSING INSTABILITY?

Stable housing has long been recognized as crucial to the physical, emotional, and economic wellbeing of individuals and families (e.g. Bratt, 2002; Leventhal and Newman 2010). Housing instability (inability to pay rent or mortgages, frequent moves, moving in with others/doubling up, eviction, or homelessness) is common among low-income households (Desmond 2012, 2016; Pilkauskas, Garfinkel and McLanahan 2014; Edin and Shaefer 2015), and is linked with increased food insecurity, hardship, depression, unemployment, and poorer educational outcomes for children (Desmond and Kimbro 2015; Goux and Maurin 2005; Kushel, Gupta, Gee and Haas 2005; Lee Tyler and Wright, 2010; Sharkey and Sampson 2010; Ziol-Guest and McKenna 2014; Cunningham, Harwood and Hall 2010). Housing instability has been increasing as the availability of affordable housing has declined (Joint Center for Housing Studies [JCHS] 2016). In 2014, a record number of households (21 million) faced extreme housing cost burdens, or paid 50% or more of their income on housing, including nearly three-quarters of low-income families (JCHS 2016). Understanding how public policy might reduce housing instability is of vital importance.

Housing subsidies (such as section 8 vouchers) for low-income renters reduce housing instability, but only 24% of the 19 million eligible households receive assistance, and wait lists for housing assistance are frequently 2 to 3 years long (Leopold, Getsinger, Blumenthal, Abzajian, and Jordan 2015). Thus, it is important to consider how other poverty related public policies, such as the Earned Income Tax Credit (EITC), might improve the housing stability of low-income households. The EITC is one of the largest cash transfer programs in the US, distributing benefits to 26 million households every year at the cost of about 66 billion dollars (Center for Budget and Policy Priorities [CBPP] 2016). In 2015, the federal EITC, which is a

refundable tax credit, was worth up to $6,242 for households with three children providing an average of $3,186 for families with children (CBPP 2016; Internal Revenue Service 2016). Twenty-six states also offer EITCs ranging from 3.5-43% of the federal benefit. By providing low-income households with cash, this policy may reduce housing instability. Yet, to date, no quantitative research has examined this link. We fill this gap in the literature using two large datasets, the Fragile Families and Child Wellbeing Study (FFCWS) and the Survey of Income and Program Participation (SIPP). By understanding the link between the EITC and housing instability, we can better consider whether the EITC serves as a poverty prevention policy and whether expansions in the policy might help address housing affordability among low-income families.

Background

The Earned Income Tax Credit

The EITC began in 1975 as a temporary credit for low-income parents, intended to offset payroll tax contributions. The credit was made permanent in 1978 and, at that time, was worth up to $400 for households earning less than $8,000 (approximately $1,700 and $36,000 in 2016 dollars, respectively). The benefit schedule has a trapezoidal structure, with benefits phasing in up to a threshold, remaining constant over some values of income (plateau), and then phasing out for earnings beyond a second threshold. In 1975, the credit phased in and out at a rate of 10 percent. Households with $4,000 in earnings were eligible for the full $400 credit. At that time, there was no EITC for households without children, and households of all sizes were eligible for the same credit amount.

Over the last several decades, there have been several expansions to the federal credit. With the tax reform act of 1986, the EITC phase-in rate was increased to 14 percent, and in 1991, a larger benefit was introduced for households with two or more children. During the

1990s, the phase-in rate for the EITC increased from 14 percent to 34 percent for households with one child, and 14 to 40 percent for households with two or more children. Beginning in 2009, a larger tax credit was introduced for households with at least three children—the phase-in rate for a three (or more)-child household increased to 45 percent. Between 1975 and 2016, the maximum federal EITC grew from $1,700 to $6,300 (2016 dollars). Single people, single parents and married parents are all eligible for the EITC; however, the vast majority of EITC recipients are single mother households, the focus of our study.

In addition to the federal EITC, 26 states and the District of Columbia had their own EITCs as of 2016. States with EITCs can be found in all regions of the country and across the political spectrum. Several large-population states have EITCs (New York, Illinois, and Pennsylvania), while other large-population states do not (Texas and Florida). Most state EITCs are structured as fixed percentages of the federal benefit, supplementing the credit for residents filing taxes in those states. A summary of state EITC policies is presented in Appendix Table 1. Benefit generosity currently ranges from 3.5 percent up to 43 percent of the federal credit. Many of the state credits are also refundable, such that households with no tax liability can still receive the credit. Some states have different levels of generosity depending on the number of children residing in the household. Wisconsin, for instance, supplements the federal credit by 4 percent for a one-child household, and 34 percent for a three-child household.

States also vary in when they implemented EITCs, with the earliest states implementing EITCs in the mid-1980s and the most recent states implementing policies in 2015. Several states changed the generosity of their benefits over time—New York, for instance, implemented an EITC in 1994 worth 7.5 percent of the federal benefit. As of 2015, New York offers a credit worth 30 percent of the federal benefit. While less common, some states also reduced or

eliminated their EITCs over time. Michigan implemented an EITC in 2008 worth 10 percent of the federal benefit, increased it to 20 percent in 2009, and reduced it to 6 percent in 2012. Colorado implemented an EITC in 1999, eliminated it in 2002, and re-introduced one in 2014.

The year that a state enacted an EITC and the generosity of state EITC benefits are sources of *between*-state variation. There is also *within*-state variation in EITC benefits as states expanded (and reduced) their programs over time. Additionally, any federal changes to the EITC also impact states that have their own EITCs, creating an additional source of between and within state variation over time. We exploit both between and within state variation over time to examine the link between the EITC and housing stability.

Housing Instability and its Consequences

Definitions of housing instability, or housing insecurity, vary, but generally focus on measures of residential mobility (frequent moves), household crowding or doubling up (living with additional people beyond the nuclear family), homelessness, eviction, and the ability to pay rent or mortgage (e.g JCHS 2016; Geller and Franklin, 2014; King, 2016). Housing instability can occur for a host of reasons, such as mental or physical health problems, drug abuse, or domestic violence, but one of the biggest predictors of housing instability is housing affordability, especially among low-income households (JCHS, 2016; Phinney, Danziger, Pollack, and Seefeldt, 2007; Pendall, Theodos and Franks, 2012). Housing affordability is generally measured by cost burden, or the amount of household income spent on a mortgage or rent. Cost burdens have increased over the last 15 years. In 2014, about half of renters were cost burdened (spent 30% or more of their income on rent), one in four was severely cost burdened (paid 50% or more of their income on rent) and 72% of low-income renters faced severe cost burdens (JCHS, 2016).

The consequences of high housing costs are far reaching, affecting household expenditures on non-housing items, neighborhood choice, and especially, housing instability (JCHS, 2016; Bratt, 2002). The most extreme version of housing instability, homelessness, is relatively rare and in 2015 about 600,000 individuals were homeless (National Alliance to End Homelessness (NAEH), 2016). Studies show that among low-income households with severe housing cost burdens, 11% reported missing a rent or mortgage payment in the last 3 months, and 9% of renters expected to be evicted in the next two months (JCHS, 2016).

Doubling-up, living with additional adults beyond the nuclear family, another form of housing instability, is frequently considered a precursor to homelessness (e.g. Wright, Caspi, Moffit and Silva, 1998). In 2014, about 7 million people in poor households were doubled up (NAEH, 2016) and doubling up is even more common among households with children (Pilkauskas, Garfinkel and McLanahan, 2014; Mykyta and Macartney, 2012). Estimates suggest that about 65% of children identified as homeless by school districts were in fact living in doubled-up households (National Center for Homeless Education, 2011). Residential mobility is also more common among low-income individuals; in 2015, 21% of low-income people moved homes, as compared to 12% of individuals with incomes more than twice the poverty line (Authors' calculations, 2015 American Community Survey).

These different forms of housing instability have been linked with a number of negative outcomes for families and children. In particular, housing instability is associated with poorer physical and mental health (Burgard, Seefeldt and Zelner, 2012; Busacker and Kasehagen, 2012; Park, Fertig and Metraux, 2011; Sugalia, Duarte and Sandel, 2011; Wood, Valdez, Hayashi and Shen, 1990), job loss (Desmond and Gershenson, 2016), and higher rates of child maltreatment (Warren and Font, 2015). Housing instability is especially detrimental to children. Frequent

school changes can lead to increased absenteeism, poorer academic outcomes and more behavioral/mental health problems (Buckner, Bassuk, Weinreb and Brooks, 1999; Gariss-Hardy and Vrooman, 2005; Coley, Leventhal, Lynch and Kull, 2013; Masten et al. 1997; Rafferty, Shinn and Weitzman, 2004; Ziol-Guest and McKenna, 2014). Overcrowding and doubling up also are linked with poorer school performance (Goux and Maurin, 2005; Solari and Mare, 2012; Low, Hallet and Mo, 2016) and educational attainment (Lopoo and London, 2016; Metzger, Fowler, Anderson and Lindsay, 2015).

The EITC and Housing Instability

The EITC may impact housing stability of low-income families through a variety of mechanisms. The EITC increases the household budget set, providing families with more disposable income to spend on housing. Through its labor supply incentives, particularly for single mothers, the EITC may lead to increases in household income and job stability and thus improve housing stability. Because households typically claim the EITC for multiple years, expansions to the EITC could lead to an increase in permanent family income through both the expansions themselves and through the labor supply incentives, which in turn impact families' ability to afford housing. Finally, because the EITC is distributed as a lump-sum around tax time, families may use the credit to put down a security deposit on a new apartment, or to pay for several months of rent in advance (Halpern-Meekin et al. 2015), increasing housing stability.

All of these mechanisms imply that the EITC should reduce housing instability among single mothers, but there may also be reason to expect an *increase* in housing instability as a function of EITC generosity. If the EITC provides families with the income to move to their own home (say out of a doubled-up house) then we might see an increase in the number of moves associated with an increase in the EITC. The EITC has also been shown to discourage marriage

(Dickert-Conlin and Houser 2002; Herbst 2011; Fisher 2012; Michelmore 2017), although there is mixed evidence regarding the magnitude of this impact. If the EITC does discourage marriage among single mothers, expansions to the EITC may alter the composition of single mothers we observe in the population. Whether this leads to a more advantaged or less advantaged population of single mothers is unclear. Previous research suggests that these marriage effects are relatively small, we return to this point in the discussion.

Although some qualitative research suggests that low-income families rely heavily on the EITC as a means of reducing housing instability, such as paying for security deposits or rent (Halpern-Meekin et al. 2015), no quantitative research has examined whether the EITC reduces housing instability. Related research has examined income transfers and found that transfers reduce housing instability. An experiment in Chicago that provided emergency cash assistance to those who were at risk of losing their homes were 76% less likely to enter a shelter compared to those who applied for assistance after the funds were depleted (Evans, Sullivan and Wallskog 2016). Research looking at administrative records of the receipt of child support found that household moves were much lower among families receiving regular support (Curtis and Warren, 2016). There is also a long literature examining the effect of housing support policies (public housing, section 8 housing vouchers) on housing stability and other outcomes. The findings from this literature are mixed, and although these programs provide in-kind income support, they are functionally very different from the EITC (e.g. use of a voucher requires finding housing within a certain area that meet rent restrictions); thus, we do not review that literature here.

Although no research has examined the impact of the EITC on housing instability, a long literature has examined the impact of the EITC on other outcomes. Much of the early research on

the EITC focused on its impact on the labor supply of low-income families. A multitude of studies have shown that the expansions to the EITC in the 1990s had a positive impact on labor supply among single mothers (Meyer and Rosenbaum 2001; Eissa and Liebman 1996; Ellwood 2000). More recent research indicates that the EITC provides many other benefits to low-income families: increasing earnings (Dahl, DeLeire, and Schwabish 2009), lifting families out of poverty (Hoynes and Patel 2015), and improving children's education outcomes (Dahl and Lochner 2012; Bastian and Michelmore 2017) to name a few. To date, less research has evaluated whether the EITC alleviates other forms of economic hardship, though there is recent work indicating that the EITC reduces unsecured debt (Shaefer, Song, and Shanks 2013) and increases household savings (Jones and Michelmore 2016). Together, this literature suggests that the EITC reduces economic uncertainty and reduces poverty, which are closely linked with housing instability. Thus, we anticipate that increases in the EITC will reduce housing instability among families with children.

The Current Study

We examine whether the EITC, a key US social welfare policy, reduces housing instability. We study multiple measures of housing instability, some extreme and rare, like homelessness and eviction, and others that are much more common such as doubling up and frequent moves. Leveraging advantages of two large datasets, the FFCWS and the SIPP, we can test the robustness of our findings across populations. By examining this important topic, we shed light on whether one of the US's most important welfare policies impacts the housing stability of its population to better inform how the EITC, and potential policy changes, might impact low-income families.

DATA AND METHOD

Data

Data come from the Fragile Families and Child Well-being Study (FFCWS) and the

Survey of Income and Program Participation (SIPP). The FFCWS is a longitudinal birth cohort

study of approximately 5,000 births between 1998 and 2000 in 20 large U.S. cities (with

populations over 200,000), in 15 states. Mothers and fathers were interviewed soon after the

birth of the focal child and follow-up interviews were conducted when the child was

approximately 1 (1999-2001), 3 (2001-2003), 5 (2003-2006), 9 (2007-2010) and 15 (2014-2016)

years old. The study includes an oversample of nonmarital births (at a ratio of 3 nonmarital to 1

marital), resulting in a relatively economically disadvantaged sample, making it ideal to examine

links between the EITC and housing instability. These data provide information on six measures

of housing stability measured at each survey wave after the birth (described more below).

We pool all years of the data and focus on single (unmarried) mothers resulting in

approximately 12,115 person-wave observations. These data are ideal as they examine families

with children, those who are most likely to be eligible for and receive the EITC, but are also a

particularly vulnerable population. Because the FFCWS is a panel, we can also control for within

person changes over time by including individual fixed effects.

We supplement these analyses with data from the SIPP longitudinal panels from 1996

through 2008.[1] SIPP data are advantageous in that they provide a nationally representative

sample rather than a sample of urban families (and provide data from more states than the

FFCWS). The SIPP conducts interviews once every four months regarding income and

household composition over the previous four months. We treat the data as repeated cross-

sectional information, and restrict the sample to single mothers in the interview months (SIPP

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[1] We focus on these SIPP panels because there was a significant change in how the SIPP categorized
cohabiting partners beginning with the 1996 panel which affects measures of doubling up. These panels also
provide data from 1996-2012, years that are similar to those in the FFCWS (1999-2016).

reporting month). Reference month reports are known to be the most accurate (Moore 2008), since non-reporting months require the respondent to reflect back on the previous four months. This restriction produces a sample of 106,226 person-month observations.[2]

By using these two datasets in conjunction we can better evaluate whether receipt of the EITC is linked with housing instability. The FFCWS offers several advantages: it includes multiple measures of housing instability, provides an oversample of low-income families – those who are likely eligible for the EITC, and allows for within person analyses to test for selection (detailed in methods). However, the FFCWS only provides data on families in 15 states. The SIPP on the other hand, includes data on families in all states, thus providing a sample more representative of the U.S. population. The SIPP, however, collects far fewer housing instability measures and does not allow for within person models (beyond the 4 year panels).

Table 1 presents descriptive statistics for the two samples. Although both samples are restricted to single mothers, the two studies are quite different. In general, the FFCWS is more disadvantaged; mothers have lower average monthly earnings, are younger, have more children and have much lower levels of education. Forty-four percent of mothers in the FFCWS have less than a high school degree as compared with 16% in the SIPP. A larger share of mothers are racial/ethnic minorities in the FFCWS, 59% black and 25% Hispanic as compared to 30% black and 17% Hispanic in the SIPP.

Housing instability. Following prior research (Geller and Curtis 2011; Geller and Franklin 2014), we examine the following measures of housing instability in both the FFCWS and the SIPP: 1) whether the mother lives in a household that is doubled up and 2) the average number of moves per year (Gilman, Kawachi, Fitzmaurice and Buka 2003). In the FFCWS we

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[2] Representing 16,812 unique individuals.

also examine whether mothers: 3) skipped a rent or mortgage payment, 4) moved in with others due to financial constraints, 5) were evicted, and 6) were homeless.

In both the FFCWS and the SIPP, doubling up is coded as one if a grandparent, parent/in-law, sibling, aunt/uncle, non-related adult, or niece/nephew over the age of 18 is living in the household. Following previous research (Pilkauskas, Garfinkel and McLanahan 2014; Mykyta and Macartney 2012), we do not consider a mother to be doubled up if she lives with a cohabiting partner (married mothers are excluded from our study), a biological or adoptive child, or other children or relatives under the age of 18. Although living with a partner is a form of doubling up, we do not include those cases, as the underlying motivation for moving in with a partner (or moving out) is likely to differ for this group and is less likely to represent a form of housing instability. In the FFCWS average number of moves per year is calculated by summing the number of moves between each survey wave divided by the number of years. In SIPP, this measure is constructed by counting the number of moves a mother reports per year.[3]

In the FFCWS four additional measures of housing stability were available. Preceding each of these questions was the following prompt: "We are also interested in some of the problems families face making ends meet. In the past 12 months, did you do any of the following because there wasn't enough money?" Mothers are coded as evicted if they report ever being evicted in the last year. Homelessness is assessed with a question that asks mothers if they ever lived in a shelter or a place not meant for living in the last year. Mothers were asked if they moved in with others in the past year because of financial problems. This measure is distinct from the doubling up because doubling up may occur for other reasons – beyond financial needs (such as a preference or perhaps some other household shock). Last, mothers were asked if they ever skipped a rent payment or mortgage in the last year because of financial difficulties.

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[3] Individuals can only report one move per wave.

Earned Income Tax Credit. Our main independent variable of interest is a household's EITC benefit. Neither the FFCWS nor the SIPP contain reliable information regarding household EITC benefits, so we impute household benefits using the National Bureau of Economic Research's TAXSIM model. We assume everyone in the sample files as head of household and claims all children residing in the household as dependents. Because variation in this measure is likely endogenous to housing instability, we also create a simulated EITC benefit that represents the average credit at the state-year-family size level. This simulated benefit captures policy variation in the EITC at the federal and state level over time, while eliminating variation in the EITC due to endogenous family processes such as job loss, geographic moves, or fertility. We further describe how this measure is constructed in the empirical strategy section.

Demographic and Contextual Variables

We include a number of demographic and state-year contextual measures in our analyses. These variables are constructed identically across both datasets. These included: Mother's education (less than high school, high school, some college and college or higher), race/ethnicity was coded as non-Hispanic Black, non-Hispanic White, Hispanic and other non-Hispanic race/ethnicity, age, and the number of children in the household. We also include state fixed effects (all 50 states for the SIPP and 15 states in FFCWS, details available in Appendix Table 2) and for survey year.

We also include a number of state-year contextual factors that might be linked with housing stability and EITC generosity. Specifically, the state unemployment rate, state gross domestic product (GDP), the top tax bracket in the state, and the maximum monthly welfare benefit available for a 3-person family.[4]

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[4] State unemployment rate comes from the Bureau of Labor Statistics Local Area Unemployment Statistics: https://www.bls.gov/lau/. State GDP comes from the Bureau of Economic Analysis Regional Data:

Empirical Strategy

Our goal is to identify what happens to housing instability when the EITC becomes more generous. Using a family's own EITC to estimate this relationship raises concerns of omitted variable bias, whereby there are unobservable characteristics correlated with both housing instability and household EITC benefits, confounding our ability to make causal inference. It is not clear, a priori, whether this will introduce positive or negative omitted variable bias. Households with more generous EITC benefits are likely of lower-income, and thus may experience more housing instability than households with smaller EITC benefits, or no benefits at all. On the other hand, nearly two-thirds of single mothers in our samples are eligible for the EITC, so a larger EITC benefit may indicate higher-earning single mothers than those with small or no EITC benefits. Since households cannot obtain the EITC unless they have positive earnings, households with larger EITCs may be in a better financial position than those with no benefits, who may have little or no earnings. We begin our analysis by estimating the following naïve OLS model:

$$(1) \ Y_i = \beta_0 + \beta_1 EITC_i + \beta_2 X_i + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \varepsilon_i \ ,$$

Where Y_i represents our outcomes of interest (e.g. doubled up, missed a rent payment) and $EITC_i$ represents own family EITC benefits given the state, year, number of children residing in the household, and family income. We also include controls for individual demographic characteristics, state fixed effects, year fixed effects, and state-year level contextual controls. Standard errors are clustered at the state level, to allow for the correlation of the error term among single mothers residing in the same state.

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https://www.bea.gov/regional/index.htm. Data on the top tax bracket in the state comes from the National Bureau of Economic Research: http://users.nber.org/~taxsim/state-rates/. Information on welfare benefits comes from the Urban Institute's Welfare Rules Database: http://wrd.urban.org/wrd/Query/query.cfm

State fixed effects control for state-level time-constant factors that may affect housing stability. Year fixed effects control for national events that may affect housing stability, such as the Great Recession. In relying partially on variation in state EITCs, we assume that state EITC generosity is uncorrelated with other events happening in the state that may affect housing instability. This may not be a valid assumption, particularly if EITC implementation is bundled with other provisions targeting low-income families. States that implement EITCs may also have higher rates of housing instability, or higher rents than states without EITCs, which would confound our ability to make causal inference. State fixed effects control for any time-invariant differences across states that may be correlated with state EITC generosity and housing instability. To address concerns that state EITCs may be implemented in conjunction with other programs, we control for a number of other state-year level controls such as the unemployment rate, state GDP, state welfare generosity, and the top tax bracket in a given state-year. Finally we also conduct a robustness check where we rely solely on the federal variation in the EITC to reduce concerns that results are driven by endogenous changes to state EITC generosity.

With all controls in the model, variation in the treatment variable of interest, $EITC_i$, stems from two main factors: policy changes in the EITC at the state, year, or family size level; and changes in household income, geographic location, or composition over time. The first source of variation is the variation of interest and is plausibly exogenous with respect to housing instability. The latter source of variation is endogenous, as changes in household income may be correlated with other unobserved factors that may influence housing instability. Our ability to causally estimate the impact of increased EITC generosity on housing instability is thus confounded in the naïve OLS model.

To overcome this problem, we use a simulated instruments approach commonly used in

the evaluation of policy changes and is similar in concept to a difference-in-differences approach (Hoynes and Patel 2015; Bulman and Hoxby 2015; Cohodes, Grossman, Kleiner and Lovenheim 2014; Currie and Gruber 1996; Jones, Milligan and Stabile 2015; Milligan and Stabile 2011). This approach provides us with average state-year-family size EITC benefits, eliminating variation due to endogenous decisions about geographic location, household income, or family structure in relation to the outcomes of interest. The simulated instrument also allows us to exploit the full richness of the EITC policy landscape over the past 20 years rather than focusing on any individual policy expansion to produce easily interpretable intent-to-treat estimates of what happens to housing stability when the average household EITC benefit becomes more generous.

To construct the simulated EITC, we take a sample of single mothers from the 1996 SIPP and estimate their tax liability (including EITC benefits) using NBER's TAXSIM model. We inflate the earnings of the single mothers in each year we would like measures of average EITC benefits (1996-2015) using the Consumer Price Index (CPI). Inflating earnings by the CPI rather than observing changes in the income distribution over time reduces concerns that changes to the EITC may affect changes in the national income distribution for single mothers. We then calculate taxes for this simulated sample of single mothers for each year between 1996 and 2015 using TAXSIM.

Once we obtain measures for the federal EITC using TAXSIM, we then calculate state EITC benefits by running this sample of single mothers through each state's EITC laws in each year between 1996 and 2015. Calculating state EITCs using the national sample of single mothers reduces concerns of endogeneity of state demographic characteristics with respect to state EITC benefits. If states with EITCs tend to have higher populations of EITC-eligible

families, for instance, we would find larger average state EITC benefits in these states than in states without their own EITCs because of these endogenous demographic differences and not solely due to differences in state tax laws.

Once we obtain measures of federal and state EITC benefits for this sample of single mothers, we then collapse the sample to the state-year-family size level. This produces a data set that contains a measure of the average federal and state EITC for a given family size (one, two, or three or more children), in a given state, in a given year. Differences in this measure will reflect only differences in policy generosity across states, time, and family size and not potentially endogenous changes to family income, family size, or geographic location.

We then match this information to our sample of single mothers by year, state, and number of children residing in the household. Because households would not receive their EITC benefits in the current tax year until the following year (e.g. households would receive EITC benefits based on 2011 tax policy in 2012), we merge the simulated EITC onto the SIPP and FFCWS using a one-year lag. We then estimate the following reduced form model:

$$(2) \quad Y_i = \beta_0 + \beta_1 EITC_{stf} + \beta_2 X_i + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \varepsilon_i \, ,$$

Here we replace own EITC benefits with simulated benefits. $EITC_{stf}$ is evaluated at the state, year, family-size level and reflects federal and state policy changes to the EITC between 1996 and 2015. With the full set of controls in the model, we estimate the impact of a $1,000 increase in EITC generosity at the state-year-family size level on different measures of housing instability. Results from this analysis provide plausibly causal estimates of how increasing EITC generosity impacts housing stability among low-income single mothers.

Using both the simulated EITC and mother's own EITC, in the FFCWS we also run

family fixed effects models. The within family change model exploits changes within a family, within a state over time. This model allows us to control for time invariant characteristics of the mother that might be correlated with her likelihood of living in a particular state that may have a generous EITC benefit and her likelihood of experiencing housing instability. Although mothers may move states over time, in the analyses with the FFCWS, we assign mothers her EITC based on the state in which she was sampled (a relatively small share of mothers move states, 13%, but in extensions we test models using current state and dropping movers). By assigning her sample state, we can avoid issues of endogeneity whereby mothers move to a state because of EITC generosity. The general model for the individual fixed effects model is:

$$(3)\ Y_i = \beta_0 + \beta_1 EITC_i + \beta_2 \alpha_{st} + \lambda_i + \gamma_t + \varepsilon_i$$

Finally, to provide estimates of how the EITC impacts housing instability in units of own EITC benefits, we then present results from the IV estimation, using the simulated EITC as an instrument for own EITC benefits. We estimate the IV using two-stage least-squares, estimating the first stage as:

$$(4)\ EITC_i = \beta_0 + \beta_1 EITC_{stf} + \beta_2 X_i + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \varepsilon_i$$

Where $EITC_{stf}$ is used as an instrument for own EITC benefits, $EITC_i$. We then use the predicted value of own EITC benefits estimated in the first stage in our second-stage equation:

$$(5)\ Y_i = \beta_0 + \beta_1 \widehat{EITC_i} + \beta_2 X_i + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \varepsilon_i$$

This model exploits the desired variation in the EITC measure, federal and state policy changes to the EITC, removing the undesired, endogenous variation in the EITC due to changes in household composition or earnings. Equation (5) will thus indicate how a $1,000 increase in own EITC benefits, as generated by policy changes to the EITC, impacts housing instability.

We conduct a number of robustness checks and sensitivity analyses to further understand any heterogeneous treatment effects in our samples. First, we examine how effects vary by income (measured as a percent of the federal poverty level). To alleviate concerns of endogeneity of income with respect to EITC generosity, we also analyze how effects vary by educational attainment at the time of the survey, as educational attainment is less likely to change as a function of EITC generosity than income. Past research suggests that the EITC is especially effective in raising household income above the poverty threshold for those just below the threshold, but is less effective for households with income well below the poverty threshold (Hoynes and Patel 2015). These analyses will illustrate whether the same pattern is true in terms of alleviating housing instability. Finally, we also conduct analyses where we exclude individuals who move across states in the Fragile Families data to test whether results are robust to potentially endogenous geographic moves. We also test whether results are robust to using a two-year lag in EITC generosity.

Results

In addition to describing the sample, Table 1 also provides descriptive statistics on housing instability. Housing instability is more common among the FFCWS sample than in the SIPP, likely because this sample is more economically disadvantaged; 28% of mothers were doubled up at the time of the interview, and on average these families moved 0.44 times/year. In comparison, 17% of SIPP mothers were doubled up and they moved an average of 0.40 times/year. The FFCWS also collected other measures of housing instability. Eviction and homelessness in the last year were relatively uncommon (both 3%). More common was moving in with others because of an inability to afford to pay rent or mortgage in the last year, 11%, and not paying rent/mortgage in the last year because of a lack of money, 16%.

Table 1 also describes the different measures of EITC used in the study. Sixty-four percent of mothers are eligible for the EITC in both samples. We might expect FFCWS mothers to be more likely to be eligible for the EITC as they have lower earnings on average, but these mothers also have lower monthly earnings ($1384) than mothers in the SIPP ($1598). Their estimated average EITC benefit ($1,590) is also slightly lower than that of mothers in the SIPP ($1,680). When we consider the simulated EITC, however, mothers in the FFCWS have a slightly higher benefit ($1,870) than SIPP mothers ($1,630) likely because FFCWS mothers have slightly more children than those in the SIPP.

Does One's Own EITC Predict Housing Instability?

In Table 2, we show the results of our naïve model, where we regress each of the housing stability measures on mother's own imputed EITC (using TAXSIM). Model 1 is the bivariate association, model 2 includes demographic characteristics and state-year level contextual controls, model 3 adds year fixed-effects and model 4 adds state fixed-effects. For the FFCWS measures, model 5 includes individual fixed effects (with demographic, contextual and year fixed effects).

Using the measure of mother's own EITC, we find few significant associations with housing instability measures. One exception is homelessness, where we find that a $1,000 increase in mother's own EITC is associated with a 0.2 percentage point decrease in the likelihood that a mother will be homeless. This finding holds in the individual fixed effect models. We also find that one's own EITC is associated with an increase in not paying rent or mortgage (0.007 in model 4); however, the coefficient is dramatically reduced and is no longer statistically significant once the model includes individual fixed effects. The direction of this coefficient is counter to what we might have expected, it suggests that getting the EITC is linked

with higher rates of missing mortgage/rent payments. This may be partly explained because the

mothers who are most likely to receive the EITC are also the same mothers who are likely to

experience certain forms of housing instability. Qualitative research has suggested that mothers

shuffle around paying bills at different times (such as skipping a rent payment to pay another

bill) in anticipation of the EITC (Halpern-Meekin et al 2015). This finding may also reflect the

endogeity of using one's own EITC to examine the relationship with housing instability, as

mothers with greater housing instability (inability to pay rent or mortgage) are those who also are

more likely to be eligible for the EITC.

In Table 3 we present results from the reduced-form model using simulated EITC

benefits rather than mother's own imputed EITC, our preferred model. As discussed in the

empirical strategy section, this measure is superior because it avoids issues of endogeneity –

where mothers who receive the EITC might be those who are most likely to experience housing

instability. As in Table 2, we present the results of the five different models. Here, unlike the

models that use mother's own EITC, we find a significant association between an increase in the

EITC and a reduction in doubling up, in both the FFCWS and the SIPP. In the fully controlled

model (4), we find that a $1,000 increase in the EITC reduces doubling up by 3 percentage

points in the SIPP and by nearly 5 percentage points in the FFCWS. Once we include individual

fixed effects in the FFCWS, the effect is weaker (-3.8 pp) and becomes marginally significant,

but it is still similar in magnitude. For average number of moves per year in the FFCWS,

although we found no association with mother's own EITC, with the simulated instrument we

find that a $1,000 increase in the EITC decreases the average number of moves by about 0.06

moves but that once we control for individual fixed effects, the coefficient is reduced to 0.037

and is no longer significant. In the SIPP we find no significant associations between the EITC

and average number of moves per year. When we examined eviction, homelessness, moving in

with others, and not paying rent or mortgage in the FFCWS, we found no significant relationship

with the EITC once the models were fully controlled.

In Table 4, we partition our treatment variable into federal and state components to

determine whether there are differential responses to EITC generosity at the state versus federal

level. We first test whether results are robust to relying solely on the federal variation in the

EITC, as there may be concerns that variation in state EITCs may not be exogenous. In

particular, there may be some concern that states implement other anti-poverty programs that

may affect housing instability at the same time as they implement EITCs. We then isolate the

proportion of the variation in the simulated EITC generated by state EITC policies to test

whether state policies produce similar results as the federal variation. Finally, Table 4 also

presents results using the simulated EITC to instrument for mother's own EITC. For simplicity,

we only report findings for doubling up but the same analyses for the other outcome variables are

available in Appendix Table 2.

The first row in Table 4 replicates the results from the reduced form specification in

Table 3. The second row presents results of regressing an indicator for whether the mother is

doubled up in the current month on the simulated EITC using only federal variation in the EITC,

excluding state variation in the EITC. While less precise, results are quite similar in the SIPP to

the model with both federal and state variation. The results are also similar, but a bit stronger in

the FFCWS when we only examine federal variation as compared to both together. This

alleviates concerns that results are driven solely by state variation in the EITC, which may be

correlated with other state factors occurring at the same time as changes to the state EITC.

The third row of Table 4 relies solely on the state variation in the EITC as the treatment

variable. States that do not have EITCs will have a zero value for this term, while a state with an

EITC worth 10% of the federal EITC will have a value of 0.10 multiplied by the average federal

EITC available in that year for a given family size. All regressions include state and year fixed

effects; variation is driven by within state changes to EITC generosity over time. This occurs

through two primary channels. First, states vary in when they implement EITCs, allowing us to

estimate year fixed effects to control for national events that may be correlated with housing

instability. Second, some states change the generosity of their EITCs over time, generating

additional variation within state over time.

Results suggest that the state variation in EITC benefits is also correlated with doubling

up. A $1,000 increase in the average state EITC benefit leads to a 7.3 percentage point decline in

the likelihood of doubling up among single mothers in the SIPP. This is a large effect, but none

of the states in our sample ever have an average state EITC worth $1,000. Among states with

EITCs, the average state EITC is worth about $290, which suggests that an increase in average

state EITC benefits of this magnitude would lead to a 2-percentage point decline in the

likelihood of doubling up. The results for the FFCWS are somewhat weaker than those in the

SIPP, likely due to the fact that only 10 of the 15 states in the sample have a state EITC. A

$1,000 increase in the average state EITC benefit is associated with a 3.8 percentage point

decline in the likelihood of doubling up, but the association is not significant nor was it

significant in the model with individual fixed effects (and was reduced to about one pp). Again,

because a $1,000 increase overstates the average size of the EITC benefit, adjusting this estimate

to the average size of state EITCs suggests a decline of 2 percentage points[5].

Finally, Table 4 also presents results of the instrumental variables (IV) specification,

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[5] The average state EITC in the 10 FFCWS states is $150, this would suggest an even smaller decrease in doubling up – about 1 percentage point.

using the simulated EITC benefit to instrument for a mother's own EITC benefits. The IV

estimation allows us to estimate how a $1,000 increase in one's own EITC is linked with

doubling up, as every mother does not receive the average EITC benefit. Results from this

exercise are quite similar to the reduced form estimates in the SIPP. This is not entirely

surprising since a sample of single mothers in the SIPP was used to construct the simulated

EITC. In fact, the first stage of the IV estimation suggests that a $1,000 increase in the simulated

EITC leads to a $920 increase in a mother's own EITC benefits. This should be interpreted with

some caution, as mother's own EITC is also imputed using TAXSIM. Mother's own reporting of

EITC receipt is not reliable in the SIPP, but previous research suggests that take-up of the EITC

is quite high among single mothers, often above 80% (Scholz 1994; Currie 2004). One should

interpret these results as intent-to-treat effects.

In the FFCWS, results from the IV analysis are a bit stronger than the reduced-form

specification. The first stage estimate suggests that a $1,000 increase in average EITC generosity

in a state-year for a given family size leads to a $720 increase in a mother's own EITC benefits.

A $1,000 increase in one's own EITC benefits, generated by plausibly exogenous variation in

federal and state EITC benefits, is associated with a 6.6 percentage point decline in the

likelihood of doubling up among single mothers.

Variation by Income and Education

The structure of the EITC; requiring labor force participation and its phase out structure,

mean that there might be variation in the effect of the EITC by income. Specifically, mothers

with no earnings are not eligible for the EITC (22% in both the FFCWS and the SIPP). Thus, we

might expect that the EITC will have little effect on housing instability for mothers at the lowest

end of the income distribution. Mothers with very low incomes (below $10,000-13,000) are also

not required to file taxes.[6] Similarly, at the higher end of the income distribution, mothers with earnings above 233% of poverty are no longer eligible for the EITC (or may be on the phase out portion of the EITC), thus we would not expect a link between the EITC and housing instability. Additionally, prior research has found that the EITC has the biggest impact on families whose earnings are between 50 and 200% of poverty (Hoynes and Patel 2015).

To test whether the effect of the EITC on housing instability varied by household income, we examined differences by stratifying by mother's income as a percent of poverty. These analyses are presented in Table 5. Again we focus on doubling up, our most robust finding and the outcome we have in both datasets, but analyses for the other outcomes are available in Appendix Table 3. Consistent with earlier research, we find the largest effect of an increase of the EITC on mother's doubling up for mothers with income in the 50-200% of poverty range. In the SIPP, mothers with income from 50-100% of poverty were 6 percentage points less likely to double up and those with incomes from 100-200% of poverty were 4 percentage points less likely. We found a similar pattern of results for mothers in the FFCWS. Mothers with incomes between 50 and 100% of poverty were 5 percentage points less likely to double up, although this coefficient was not significant (likely due to insufficient power) and mothers between 100 and 200% of poverty were 13 percentage points less likely to double up. In both datasets the mothers with incomes below 50% of poverty and above 200% of poverty were less likely to double up, but the coefficients were much smaller (and was zero for 200% + in the FFCWS).

Variation in the effect of the EITC on housing instability by income is to be expected given the structure of the EITC itself, but one might be concerned that income is endogenous to EITC policy. Another way to proxy for income is to examine differences by maternal education,

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[6] In 2016, single filers are not required to file taxes if their W-2 income was less than $10,350. Head of household filers are not required to file taxes if their W-2 income was less than $13,350. Table 4-1, Filing Requirements Chart for Most Taxpayers. https://www.irs.gov/publications/p570/ch04.html#en_US_2016_publink1000221363

which is less likely to respond to changes in EITC policy or doubling up. In Table 5, we also present the analyses examining the effect of the simulated EITC on doubling up, stratifying by maternal education level. We find a very similar pattern of results as to those when we stratified by income. Again, we find that the significant association between the EITC and doubling up is concentrated among those in the middle groups – mothers with a high school degree or some college. In the SIPP, we find a $1000 increase in the EITC decreased doubling up by 5.7 percentage points among mothers with a high school degree and 4.3 percentage points among mothers with some college. For the FFCWS, a $1000 increase in the EITC decreases doubling up by 9.3 percentage points for high school educated mothers and 4.8 percentage points for mothers with some college, although the association was not significant. Similarly, we see some potential evidence that for mothers with less than a high school degree, the EITC reduced doubling up by 3.1 percentage points, but again the association was not significant (but it is similar in magnitude). Last, it is worth noting that the analysis suggests that the EITC is associated with a 20 percentage point increase in doubling up among the college educated mothers in the FFCWS (although the coefficient is not significant). These mothers are a select group of mothers; only 5% of doubled up mothers have a college degree, and very few receive the EITC (n=44 when we use mother's own EITC).

Additional Sensitivity Tests

To examine whether the findings were robust, we ran a number of additional analyses related to model specification. First, because with the exception of the average number of moves per year, we are examining binary outcomes, we tested whether the findings were robust to using a logit model. We found very similar findings in both the SIPP and the FFCWS when we ran them as logits. Second, we tested a longer lag in the EITC policies. Our main model uses the

previous tax year (so for example, 1999 tax year on 2000 data), but if receipt of the EITC refund for tax year 1999 that occurs in 2000 has an effect on housing instability in 2001, a longer lag may be more appropriate. Thus, we tested the same models where we lagged the EITC by 2 years. In general, the findings were the same, although for doubling up and average number of moves per year in the FFCWS, the 2 year lag was somewhat more strongly associated (including the models with individual fixed effects) and the SIPP was somewhat weaker. We found that with the 2 year lag a $1000 increase in the EITC was associated with a 5 percentage point decrease in doubling up and a .07 decrease in the average number of moves.

We also ran a few sensitivity tests related to the sample make up. College-educated mothers are least likely to receive the EITC and are less likely to be single mothers. We ran an analysis excluding these mothers from the sample and the substantive findings were unchanged. Because mothers who live in public housing are not supposed to double up and are less likely to experience housing instability, we also ran an analysis excluding those mothers from the sample, and again the results were largely unchanged although the association in the SIPP was somewhat larger (-3.5 percentage points).

In the FFCWS, 13% of the sample moved from the state in which they were originally sampled. In our main analyses, we used the state in which mothers were originally sampled, rather then her current state, to address the possibility that mothers might migrate in response to the EITC. But this means there are a number of mothers for whom we are estimating changes in a state EITC that is not the state they currently live in. Thus, we re-ran the same set of analyses using mother's current state of residence. The findings for these analyses were very similar to those presented with baseline state (results available upon request). We also re-ran the analysis dropping the group of mothers who moved states, and again found very similar substantive

findings. Together, these suggest little evidence of selective migration.

Last, we ran our subgroup analysis by income using income from the first wave of the survey (in FFCWS) or panel (in SIPP) to get around some issues of endogeneity. Again, we found very similar findings to those presented in Table 5.

DISCUSSION

As rents have increased and more families are cost burdened by housing, there has been a growing interest in considering how public policy might better address the housing needs of low-income families. We study whether the EITC, one of the largest US social policies, decreases housing instability and provide the first evidence that expansions to the EITC might help reduce housing insecurity. We find strong evidence that a $1000 expansion to the EITC reduces doubling up by between 3 and 5 percentage points and this finding is robust across modeling specifications and in sensitivity tests. We find slightly weaker evidence that expansions to the EITC also reduce the average number of moves made in a year, between 0.03 and 0.06 moves. We find no link between an increase in the EITC and more extreme forms of housing instability such as homelessness or eviction, but these forms of housing instability are far less common than doubling up.

This study offers some important implications for both tax and housing policy. Currently 26 states offer EITCs; for states with tougher housing markets, or high rates of cost burdened renters, implementing an EITC may be one way to help reduce some forms of housing instability. Our findings suggest that that a $1,000 increase would reduce doubling up by 18%, a relatively large effect; however, this would be a large increase in the current EITC, which for the average single parent family is about $1,600. If we consider an expanded EITC of $250, our estimates would predict doubling up to decrease by 4-5% (or 1-2 percentage points). Reducing

housing instability in the form of doubling up would likely help families avoid more extreme forms of housing instability as doubling up is one of the strongest predictors or homelessness and in the case of school children is considered homelessness (when children live in someone's home that is not owned/rented by their parents). By reducing doubling up, we might also improve child well-being as prior research has also found that doubling up (and the frequently accompanying household crowding) is linked with poorer educational outcomes for children (e.g. Goux and Maurin, 2005; Solari and Mare, 2012; Low, Hallet and Mo, 2016; Lopoo and London, 2016; Metzger, Fowler, Anderson and Lindsay, 2015) and increased vulnerability to adverse experiences (Edin and Shaefer, 2015).

In the analyses that stratify by income and education, the findings suggest that the EITC does little to reduce doubling up among those at the very bottom of the income and education distribution. This finding is in keeping with prior research by Hoynes and Patel (2015) who found that the EITC was less effective at lifting families out of poverty if they were particularly low-income. This is in part because those with no earnings are not eligible for the EITC, and those with very low earnings may not file taxes. Thus, although the EITC is helping to reduce housing instability, it may be doing little to assist those who arguably need the most assistance – those below 50% of poverty or those with less than a high school degree.

This study it not without limitations. Our analyses focus on single mothers, those who are most likely to be at risk for housing instability and eligible for the EITC, but future research should examine whether these findings extend to eligible married couple households and single individuals. As noted earlier, if the sample single mothers is affected by the EITC, say through reduced marriage, this may bias our estimates. Previous research has found the effect of the EITC on marriage to be small (Dickert-Conlin and Houser 2002; Herbst 2011; Fisher 2012;

Michelmore 2017); the magnitude of our results are likely too large to be completely explained by marriage effects.

Nonetheless, this research suggests that expansions to the EITC may help reduce housing instability, especially in the form of doubling up. Although the EITC is not traditionally thought of as a housing policy, policy makers interested in housing issues might consider implementing state EITCs or pushing for an increased Federal EITC. By reducing doubling up and increasing the stability in the living arrangements of children we might be able to help reduce the intergenerational consequences of housing instability.

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Table 1: Sample Characteristics, SIPP 1996-2008 Panels, FFCWS Waves 2-6

	FFCWS	SIPP
Demographic Characteristics of Mothers		
Monthly earnings ($)	1384	1598
(SD)	(1440)	(2352)
Income as % of poverty	0.93	1.17
(SD)	(1.17)	(1.25)
Age	24.01	36.09
(SD)	(5.66)	(8.67)
Number of children	2.04	1.78
(SD)	(.83)	(0.98)
Education		
Less than HS	0.44	0.16
HS degree	0.29	0.31
Some College	0.23	0.40
College degree	0.04	0.14
Race/Ethnicity		
Non-Hispanic White	0.14	0.48
Non-Hispanic Black	0.59	0.30
Hispanic	0.25	0.17
Other	0.02	0.04
State/Year Contextual Factors		
Unemployment rate (year)	5.16	5.36
(SD)	(1.29)	(1.49)
Top tax	4.82	5.12
(SD)	(3.14)	(3.25)
State GDP (logged millions of dollars)	13.11	12.69
(SD)	(.67)	(0.97)
Max benefit (monthly hundreds of dollars)	4.3	4.07
(SD)	(1.62)	(1.64)
Housing Instability		
Doubled up in current month	0.28	0.17
Average number moves/year	0.44	0.40
(SD)		
Eviction	0.03	-
Homelessness	0.03	-
Moved in with others because couldn't pay rent/mortgage	0.11	-
Not pay rent/mortgage because couldn't afford to	0.16	-
EITC Specifications		
Share of sample eligible for the EITC	0.64	0.64
Own EITC benefit (taxsim, in thousands)	1.59	1.68
(SD)	(1.8)	(1.74)
Simulated EITC benefit (in thousands)	1.87	1.63
(SD)	(.51)	(0.48)
Simulated federal EITC benefit (in thousands)	1.72	1.54
(SD)	(0.41)	(.406)
Simulated state EITC benefits (in thousands)	0.15	0.07
(SD)	(0.23)	(0.16)
N	12,115	106,226

Note: Pooled samples, single mothers. FFCWS is pooled, person-years covering tax years 1998-2015. SIPP sample is at the person-month and restricted to mothers aged 18-65 and to the reporting month (month 4 covering tax years 1995-2012.

Table 2: Housing Insecurity and the EITC - Own EITC (Naiive) Analyses

	Model 1	Model 2	Model 3	Model 4	Model 5
SIPP					
Doubled Up					
Own EITC	-0.001	0.001	0.001	0.001	
	(0.002)	(0.002)	(0.002)	(0.002)	
Observations			106,179		
FFCWS					
Doubled Up					
Own EITC	-0.011**	-0.003	0.001	0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Observations			12,071		
Number of individuals					3,683
Average # of Moves/Year					
Own EITC	-0.002	-0.003	0.005+	0.004	0.000
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Observations			12048		
Number of individuals					3,681
Evicted					
Own EITC	0.003+	0.002	0.002	0.002	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations			12053		
Number of individuals					3,681
Homeless					
Own EITC	-0.002*	-0.003**	-0.002**	-0.002**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations			12062		
Number of individuals					3,682
Moved in with Others					
Own EITC	0.003	0.001	0.002	0.002	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations			12060		
Number of individuals					3,682
Did Not Pay Rent/Mortgate					
Own EITC	0.009**	0.008**	0.007*	0.007*	0.002
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Observations			11915		
Number of individuals					3,664
Demographic & Contextual Controls		X	X	X	X
Year FE			X	X	X
State FE				X	
Individual FE					X

Notes: Model 1, no controls; Model 2, plus demographic and state-year contextual controls; Model 3 plus year fixed effects; Model 4 plus state fixed effects, Model 5 plus individual fixed effects (no state fixed effects). EITC is in thousands.
+ p<.10, * p<.05, ** p<.01, *** p<.001

Table 3: Housing Insecurity and the EITC - Simulated Instrument Analyses

	Model 1	Model 2	Model 3	Model 4	Model 5
SIPP					
Doubled Up					
Simulated EITC	-0.04***	-0.019*	-0.031*	-0.030*	
	(0.007)	(0.009)	(0.009)	(0.011)	
Observations			106,179		
FFCWS					
Doubled Up					
Simulated EITC	-0.165***	-0.088***	-0.047**	-0.047**	-0.038+
	(0.013)	(0.011)	(0.012)	(0.014)	(0.022)
Observations			12,071		
Number of individuals					3,683
Average # of Moves/Year					
Simulated EITC	-0.109**	-0.136*	-0.079+	-0.062*	-0.037
	(0.032)	(0.048)	(0.039)	(0.026)	(0.029)
Observations			12,048		
Number of individuals					3,681
Evicted					
Simulated EITC	0.010***	-0.001	-0.003	-0.004	0.002
	(0.002)	(0.007)	(0.006)	(0.007)	(0.009)
Observations			12,053		
Number of individuals					3,681
Homeless					
Simulated EITC	-0.001	-0.007	-0.007	-0.009	-0.002
	(0.004)	(0.006)	(0.006)	(0.008)	(0.009)
Observations			12,062		
Number of individuals					3,682
Moved in with Others					
Simulated EITC	-0.012	-0.032+	-0.018	-0.019	-0.006
	(0.011)	(0.017)	(0.015)	(0.014)	(0.016)
Observations			12,060		
Number of individuals					3,682
Did Not Pay Rent/Mortgage					
Simulated EITC	0.041***	0.038*	0.015	0.015	0.026
	(0.007)	(0.015)	(0.013)	(0.012)	(0.018)
Observations			11,915		
Number of individuals					3,664
Demographic & Contextual Controls		X	X	X	X
Year FE			X	X	X
State FE				X	
Individual FE					X

Notes: Model 1, no controls; Model 2, plus demographic and state-year contextual controls; Model 3 plus year fixed effects; Model 4 plus state fixed effects, Model 5 plus individual fixed effects (no state fixed effects). EITC is in thousands.
+ p<.10, * p<.05, ** p<.01, *** p<.001

Table 4: Alternative Specifications of the EITC

	SIPP	FFCWS	
Doubled up at interview			
Simulated EITC	-0.030*	-0.047**	-0.038+
	(0.011)	(0.014)	(0.022)
Simulated EITC (federal variation only)	-0.028+	-0.057**	-0.051*
	(0.017)	(0.016)	(0.025)
Simulated EITC (state variation only)	-0.073**	-0.038	-0.008
	(0.026)	(0.053)	(0.055)
Instrument for own EITC with simulated EITC	-0.032*	-0.066*	
	(0.014)	(0.027)	
First Stage	0.919***	0.719***	
	(0.067)	(0.076)	
F-Statistic	186.86	89.39	
Demographic & Contextual Controls	X	X	X
Year FE	X	X	X
State FE	X	X	
Individual FE			X
Observations	106,179	12,071	12,071
Number of individuals			3,683

Notes:

All models include demographic and contextual characterisics, state and year fixed effects except the individual fixed effects which excludes state. EITC is in thousands.

+ p<.10, * p<.05, ** p<.01, *** p<.001

Table 5: EITC and Doubling Up - by Mother's Income as a Percent of Poverty & Education

Doubled Up	Mother's Income as a % of Poverty				Mother's Educational Attainment			
	<50%	50-100%	1-200%	200+%	<High School	High School	Some College	College or greater
				SIPP				
Simulated EITC	-0.012	-0.064+	-0.041+	-0.034	0.004	-0.057**	-0.043**	0.017
	(0.017)	(0.032)	(0.023)	('0.022)	(0.046)	(0.023)	(0.021)	0.033
Observations	41,296	18,181	26,024	20,709	16,987	33,119	42,326	13,794
				FFCWS				
Simulated EITC	-0.02	-0.05	-0.13*	0.00	-0.031	-0.093*	-0.048	0.204
	(0.03)	(0.05)	(0.04)	(0.05)	(0.029)	(0.040)	(0.040)	(0.132)
Observations	5,244	2,166	2,983	1,551	5,365	3,462	2,830	414

Note: Mother's income is measured at time of inteview. All models include demographic and contextual characterisics, state and year fixed effects. EITC is in thousands.

+ p<.10, * p<.05, ** p<.01, *** p<.001

Appendix Table 1. State EITC generosity by year, expressed as a share of the federal EITC

APPENDIX TABLE 1. STATE EITC GENEROSITY BY YEAR, EXPRESSED AS A SHARE OF THE FEDERAL EITC

Tax Year	CA	CO	CT	DC	DE**	IL	IN	IA	KS	LA	ME**	MD	MA	MI	MN*	NE	NJ	NM	NY	NC	OH**	OK	OR	RI	VT	VA**	WA	WI (1)	WI (2)	WI (3)
1986																								0.2221**						
1987																								0.2346**						
1988																								0.2296**	0.23					
1989																								0.2296**	0.25			0.05	0.25	0.75
1990								0.05**																0.2296**	0.28			0.05	0.25	0.75
1991								0.065**							0.1									0.275**	0.28			0.05	0.25	0.75
1992								0.065**							0.1									0.275**	0.28			0.05	0.25	0.75
1993								0.065**							0.15									0.275**	0.28			0.05	0.25	0.75
1994								0.065**							0.15				0.075					0.275**	0.25			0.044	0.208	0.625
1995								0.065**							0.15				0.1					0.275**	0.25			0.04	0.16	0.5
1996								0.065**							0.15				0.2					0.275**	0.25			0.04	0.14	0.43
1997								0.065**					0.1		0.15				0.2				0.05**	0.275**	0.25			0.04	0.14	0.43
1998							0.1	0.065**				0.1	0.1		0.25				0.2				0.05**	0.27**	0.25			0.04	0.14	0.43
1999		0.085					0.1	0.065**				0.1	0.1		0.25				0.2				0.05**	0.265**	0.25			0.04	0.14	0.43
2000		0.1		0.1		0.05**	0.1	0.065**		0.05		0.15	0.1		0.25		0.1		0.225				0.05**	0.26**	0.32			0.04	0.14	0.43
2001		0.1	0.25			0.05**	0.1	0.065**		0.05		0.16	0.15		0.33		0.15		0.25				0.05**	0.255**	0.32			0.04	0.14	0.43
2002		0	0.25			0.05**		0.065**	0.15	0.05		0.16	0.15		0.33		0.175		0.275			0.05	0.05**	0.25**	0.32			0.04	0.14	0.43
2003		0	0.25			0.05	0.06	0.065**	0.15	0.05		0.18	0.15		0.33	0.08	0.2		0.3			0.05	0.05**	0.25	0.32			0.04	0.14	0.43
2004		0	0.25			0.05	0.06	0.065**	0.15	0.05		0.2	0.15		0.33	0.08	0.2		0.3			0.05	0.05**	0.25	0.32			0.04	0.14	0.43
2005		0	0.35			0.05	0.06	0.065**	0.15	0.05		0.2	0.15		0.33	0.08	0.2		0.3			0.05	0.05	0.25	0.32			0.04	0.14	0.43
2006		0	0.35	0.2		0.05	0.06	0.065**	0.15	0.05		0.2	0.15		0.33	0.08	0.2		0.3			0.05	0.05	0.25	0.32	0.2		0.04	0.14	0.43
2007		0	0.35	0.2		0.05	0.06	0.065	0.17	0.05		0.2	0.15	0	0.33	0.08	0.2	0.08	0.3			0.05	0.05	0.25	0.32	0.2		0.04	0.14	0.43
2008		0		0.4	0.2	0.05	0.06	0.065	0.17	0.035	0.05	0.25	0.15	0.1	0.33	0.1	0.225	0.1	0.3	0.035		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.14	0.43
2009		0		0.4	0.2	0.05	0.09	0.065	0.17	0.035	0.05	0.25	0.15	0.2	0.33	0.1	0.25	0.1	0.3	0.05		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.14	0.43
2010		0		0.4	0.2	0.05	0.09	0.065	0.18	0.035	0.05	0.25	0.15	0.2	0.33	0.1	0.2	0.1	0.3	0.05		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.14	0.43
2011		0	0.3	0.4	0.2	0.05	0.09	0.065	0.18	0.035	0.05	0.25	0.15	0.2	0.33	0.1	0.2	0.1	0.3	0.05		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.11	0.34
2012		0	0.3	0.4	0.2	0.05	0.09	0.065	0.18	0.035	0.05	0.25	0.15	0.06	0.33	0.1	0.2	0.1	0.3	0.05		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.11	0.34
2013		0	0.3	0.4	0.2	0.05	0.06	0.07	0.18	0.035	0.05	0.25	0.15	0.06	0.33	0.1	0.2	0.1	0.3	0.05		0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.11	0.34
2014		0.1	0.275	0.4	0.2	0.1	0.09	0.14	0.17	0.035	0.05	0.25	0.15	0.06	0.33	0.1	0.2	0.1	0.3	0.05	0.05	0.05	0.08	0.25	0.32	0.2	0.1***	0.04	0.11	0.34
2015	0.425	0.1	0.3	0.4	0.2	0.1	0.09	0.14	0.17	0.035	0.05	0.25	0.15	0.06	0.33	0.1	0.2	0.1	0.3	0.05	0.05	0.05	0.06	0.25	0.32	0.2	0.1***	0.04	0.11	0.34

Sources: Leigh(2010); Tax Policy Center (2015): http://www.taxpolicycenter.org/statistics/state-eitc-based-federal-eitc

*Minnesota has a slightly different strucuture to its state EITC that is not a direct share of the federal EITC starting in 2001. The average benefit level is listed from 2001 onward for Minnesota

**Denotes non-refundable credit.

***Washington announced an EITC in 2008, but has not yet implemented it.

Shading indicates states in the FF data

Appendix Table 2 : Alternative Specifications of the EITC - Other Outcome Variables

	SIPP			FFCWS							
	Average # moves/year			Evicted		Homeless		Moved in with others		Not paid rent	
Simulated EITC	-0.007	-0.062*	-0.037	-0.004	0.002	-0.009	-0.002	-0.019	-0.006	0.015	0.026
	(0.027)	(0.026)	(0.029)	(0.007)	(0.009)	(0.008)	(0.009)	(0.014)	(0.016)	(0.012)	(0.018)
Simulated EITC (federal variation only)	-0.029	-0.072*	-0.039	-0.002	0.004	-0.012	-0.004	-0.018	-0.005	0.016	0.025
	0.03	(0.032)	(0.034)	(0.008)	(0.011)	(0.010)	(0.010)	(0.018)	(0.019)	(0.012)	(0.021)
Simulated EITC (state variation only)	0.16 *	-0.064	-0.057								
	0.075	(0.042)	(0.075)								
Instrument for own EITC with simulated EITC	-0.008	-0.086*		-0.006		-0.013		-0.027		0.021	
	0.029	(0.034)		(0.010)		(0.008)		(0.018)		(0.022)	
First Stage	0.918***	0.72***		0.72***		0.719***		0.717***		0.719***	
	0.067	(0.076)		(0.076)		(0.076)		(0.076)		(0.076)	
F-Statistic	187.68	89.68		89.53		89.25		88.87		87.07	
Demographic Controls	X	X	X	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X	X	X	X
State FE	X	X		X		X		X		X	
Individual FE			X		X		X		X		X
Observations	22139	12048	12048	12053	12053	12062	12062	12060	12060	11915	11915
Number of idnum			3681		3681		3682		3682		3664

Notes: All models include demographic and contextual characterisics, state and year fixed effects except the individual fixed effects which excludes state. EITC is in thousands.

+ p<.10, * p<.05, ** p<.01, *** p<.001

Appendix Table 3: EITC and Doubling Up - by Mother's Income as a Percent of Poverty and by Education

	Mother's Income as a % of Poverty				Mother's Educational Attainment			
	<50%	50-100%	1-200%	200+%	<High School	High School	Some College	College or greater
SIPP								
Doubled up								
Simulated EITC	-0.012	-0.064+	-0.041+	-0.034	0.004	-0.057**	-0.043**	0.017
	0.017	0.032	0.023	0.022	(0.046)	(0.023)	(0.021)	0.033
Observations	41,296	18,181	26,024	20,709	16,987	33,119	42,326	13,794
FFCWS								
Doubled up								
Simulated EITC	-0.02	-0.05	-0.13*	0.00	-0.031	-0.093*	-0.048	0.204
	(0.03)	(0.05)	(0.04)	(0.05)	(0.029)	(0.040)	(0.040)	(0.132)
Observations	5,244	2,166	2,983	1,551	5,365	3,462	2,830	414
Average # of Moves/Year								
Simulated EITC	-0.11**	-0.03	-0.05	-0.04	-0.097*	-0.026	-0.080*	-0.059
	(0.03)	(0.09)	(0.06)	(0.06)	(0.039)	(0.044)	(0.030)	(0.153)
Observations	5,226	2,166	2,980	1,551	5,352	3,454	2,828	414
Evicted								
Simulated EITC	-0.02	0.03	-0.00	0.02	-0.001	-0.001	-0.023**	0.052
	(0.01)	(0.02)	(0.02)	(0.02)	(0.010)	(0.014)	(0.008)	(0.036)
Observations	5,232	2,164	2,980	1,551	5,356	3,456	2,827	414
Homeless								
Simulated EITC	-0.02	-0.01	-0.00	0.01	-0.012	-0.009	-0.010	0.053+
	(0.01)	(0.01)	(0.01)	(0.01)	(0.012)	(0.011)	(0.010)	(0.030)
Observations	5,235	2,166	2,983	1,551	5,361	3,457	2,830	414
Moved in with Others								
Simulated EITC	-0.04	-0.03	0.01	0.06*	-0.020	-0.027+	-0.003	-0.015
	(0.02)	(0.04)	(0.02)	(0.03)	(0.023)	(0.015)	(0.022)	(0.050)
Observations	5,235	2,166	2,981	1,551	5,360	3,457	2,829	414
Did Not Pay Rent/Mortgate								
Simulated EITC	0.01	0.03	0.00	0.05	0.002	0.047**	-0.015	-0.110
	(0.02)	(0.04)	(0.02)	(0.05)	(0.025)	(0.014)	(0.042)	(0.111)
Observations	5,165	2,135	2,954	1,535	5,282	3,422	2,805	406

Note: Income is measured at inteview. All models include demographic and constextual characterisics, state and year fixed effects. EITC is in thousands.
+ p<.10, * p<.05, ** p<.01, *** p<.001