The Fragile Families and Child Wellbeing Study changed its name to The Future of Families and Child Wellbeing Study (FFCWS). Due to the issue date of this document, FFCWS will be referenced by its former name. Any further reference to FFCWS should kindly observe this name change.

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Natasha Pilkauskas, The University of Michigan and Katherine Michelmore, Syracuse University

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Natasha Pilkauskas, Ph.D., MPP
Assistant Professor of Public Policy
University of Michigan Ford School of Public Policy
735 S. State Street
Ann Arbor MI 48109
734-615-6984
npilkaus@umich.edu

Katherine Michelmore, Ph.D.
Assistant Professor of Public Administration and International Affairs
Syracuse University Maxwell School of Citizenship and Public Affairs
426 Eggers Hall
Syracuse, NY 13244
315-443-9049
kmmichel@syr.edu

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ABSTRACT

Housing instability (inability to pay rent, frequent moves, 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. In this study, we examine 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. Using longitudinal data from the Fragile Families and Child Wellbeing Study and the Survey of Income and Program Participation, we employ a simulated instruments strategy to examine whether policy-induced expansions in the EITC reduce housing instability. Results suggest that a $1,000 increase in the EITC reduces doubling up (living with other non-nuclear family adults) 3 to 5 percentage points. We find some suggestive evidence that the EITC decreases the average number of moves per year (0.05 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.

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 & 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, 2016; Edin & Shaefer, 2015; Pilkauskas, Garfinkel & McLanahan, 2014;), and is linked with increased food insecurity, hardship, depression, unemployment, and poorer educational outcomes for children (Desmond & Kimbro, 2015; Goux & Maurin, 2005; Kushel et al., 2005; Lee, Tyler & Wright, 2010; Sharkey & Sampson, 2010; Ziol-Guest & McKenna, 2014). 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 et al., 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. By understanding the link between the EITC and housing instability, we can better consider whether expansions to the EITC might help address housing affordability among low-income families.

There are several reasons why the EITC may affect the housing stability of low-income households. It is currently 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). In addition to the benefit itself, a long line of research on the EITC has also shown that it increases the labor supply of single mothers (e.g. Eissa & Liebman, 1996), which has been shown to have a positive impact on longer-term earnings growth (Dahl, DeLeire, & Schwabish, 2009). Thus, the EITC may improve housing instability through multiple mechanisms. By providing low-income households with a lump-sum cash benefit, the EITC may afford individuals the ability to pay rent several months in advance, or make a security deposit on a new apartment. Through its labor supply incentives, the EITC may improve the long-run economic circumstances of low-income households, which may in turn reduce housing instability.

Despite its potential to have a big impact on housing instability, 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). Using a simulated instruments approach, we examine whether state and federal expansions to the EITC reduce housing instability. We find that EITC expansions reduce doubling up and may reduce the average number of moves per year, but that it has no effect on eviction, homelessness, or whether mothers missed rent or mortgage payments. To test how the EITC reduces doubling up we examine whether the effect is stronger around tax time (as a proxy for the lump sum payment mechanism), its effect on employment and income, and whether mothers move out into their own home (versus having others move out). We find evidence the EITC reduces doubling up through its impact on pre-tax income, allowing mothers to move out

of doubled-up homes and into their own homes, and suggestive evidence that the lump sum matters as well. Last, because the structure of the EITC requires mothers to have earnings, it may not help those who experience the most instability. In examining heterogeneous treatment effects by income and educational attainment, we find 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, doing little to alleviate housing instability among mothers with very low income and educational attainment.

BACKGROUND

The Earned Income Tax Credit

The EITC began in 1975 as a temporary credit (made permanent in 1978) for low-income parents, intended to offset payroll tax contributions. 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. For this study, we focus on single mother households, who represent the majority of EITC recipients as well as the majority of dollars spent on the EITC (Tax Policy Center 2006).

In addition to the federal EITC, 26 states and the District of Columbia had their own EITCs as of 2016. A summary of state EITC policies is presented in Appendix Table 1. 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. 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. States 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, most becoming more generous; however, some have also decreased generosity.

The year that a state enacted an EITC and the generosity of state EITC benefits are sources of *between*-state variation. *Within*-state variation in EITC benefits arises as states expand (and reduce) 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. Geller & Franklin, 2014; JCHS, 2016; 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 et al., 2007). 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 (Bratt, 2002; JCHS, 2016). 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 et al., 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 & McLanahan, 2014). 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 (e.g. Burgard, Seefeldt & Zelner, 2012; Sugalia, Duarte & Sandel, 2011; Wood et al., 1990) and job loss (Desmond & Gershenson, 2016). Housing instability is especially detrimental to children and is associated with higher rates of child maltreatment (Warren & Font, 2015). Frequent school changes can lead to increased absenteeism, poorer academic outcomes and more behavioral/mental health problems (e.g. Buckner et al., 1999; Masten et al. 1997; Ziol-Guest & McKenna, 2014). Overcrowding and doubling up also are linked with poorer school performance (Goux & Maurin, 2005; Low, Hallett & Mo, 2016; Solari & Mare, 2012) and educational attainment (Lopoo & London, 2016; Metzger et al., 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 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).

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 & Houser, 2002; Fisher, 2012; Herbst, 2011; 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 percent less likely to enter a shelter compared to those who applied for assistance after the funds were depleted (Evans, Sullivan &

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 & 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 related 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 (Eissa & Liebman, 1996; Ellwood, 2000; Meyer & Rosenbaum, 2001). More recent research indicates that the EITC provides many other benefits to low-income families: increasing earnings (Dahl, DeLeire & Schwabish, 2009), lifting families out of poverty (Hoynes & Patel, 2015), reducing child neglect (Berger et al., 2016) and improving children's education outcomes (Bastian & Michelmore, 2017; Dahl & Lochner, 2012) to name a few. To date, less research has evaluated whether the EITC alleviates other forms of economic hardship, though recent work indicates that the EITC reduces unsecured debt (Shaefer, Song & Shanks, 2013) and increases household savings (Jones & 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.

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 (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. We pool all years of the data and focus on single (unmarried) mothers resulting in approximately 12,276 person-wave observations.

We supplement these analyses with data from the SIPP longitudinal panels from 1990 through 2008. 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 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 134,175 person-month observations representing 23,817 unique individuals.

By using these two datasets, we can better evaluate whether eligibility for 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 from 1999 to 2015. The SIPP includes data on families in all states, thus providing a sample that is representative of the U.S. population. The SIPP also goes back further in time, allowing us to capture the impact of the large federal EITC expansions in the early 1990s, as well as any state EITC changes that happened in the early 1990s. The SIPP, however, collects 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 17% in the SIPP. A larger share of mothers are racial/ethnic minorities in the FFCWS, 59% black and 25% Hispanic as compared to 31% black and 15% Hispanic in the SIPP.

Housing instability. Following prior research (Geller & Curtis, 2011; Geller & 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 et al., 2003). In the FFCWS we also examine whether mothers: 3) skipped a rent or mortgage payment, 4) were evicted, and 5) 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 (Mykyta & Macartney, 2012; Pilkauskas, Garfinkel & McLanahan, 2014), 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 SIPP, prior to the 1996 panel, cohabiting partners were not explicitly identified in the household roster, but instead were included in the 'non-relative of household reference person and unrelated to anyone in the household' category. We consider a householder cohabiting (and therefore not doubled up) in the 1990-1993 SIPP panels if any opposite-sex individual identified as a non-relative within 5 years of age of the householder (either older or younger) is residing in the household. This adjustment makes the rates of doubling up in the 1990-1993 panels identical to those for the 1996-2008 panels (16%).

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 the FFCWS. In SIPP, average moves is constructed by counting the number of moves mothers report per year (a max of 3). In the FFCWS three additional measures of housing stability were available. 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. Last, mothers were asked if they ever skipped a rent payment or mortgage in the last year because they did not have enough money.

In the FFCWS, we can also identify whether the mother or her romantic partner is the primary owner or lessee on the rental agreement for survey years 3-15. This allows us to distinguish households where the mother is living in someone else's home versus whether the mother has other adults residing in her home.

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. We cannot directly observe whether the individuals in our sample actually receive the EITC, but prior research suggests that take-up rates of the EITC are quite high at around 80% (Currie, 2004; Scholz, 1994). Still, these imputed EITC benefits should be interpreted as eligibility rather than receipt.

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: respondent'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 1) and survey year fixed effects.

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.[1]

Empirical Strategy

We begin our analysis by estimating the following naïve OLS model (we also conducted logit models; results were similar and are available upon request):

$$(1)\quad \#_{\$} = \&_{\cdot} + \&_{)}\,{}^{*}+,-_{\$} + \&_{_}/_{\$} + \&_{0}1_{23} + 4_{2} + 5_{3} + 6_{\$}\,,$$

Where $\#_{\$}$ represents our outcomes of interest (e.g. doubled up, missed a rent payment) and ${}^{*}+,-_{\$}$ represents own imputed 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, as described above. 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.

With all controls in the model, variation in the treatment variable of interest, ${}^{*}+,-_{\$}$, 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 correlate with other unobserved factors that may influence housing instability, confounding our ability to make causal inference. It is not clear, a priori, whether this will introduce positive or

[1] 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: 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

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.

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 (Bulman & Hoxby, 2015; Cohodes et al., 2014; Currie & Gruber, 1996; Hoynes & Patel, 2015; Jones, Milligan & Stabile, 2015; Milligan & Stabile, 2011). 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 (deflate) the earnings of the single mothers in each year we would like measures of average EITC benefits (1990-2015) using the Consumer Price Index (CPI). Inflating (deflating) 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 1990 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 1990 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. A visual depiction of this variation is presented in Appendix Figure 1, which shows average federal and state EITC benefits by state and number of children residing in the household.

For a one-child household, the difference in average EITC benefits in states that do not have their own EITCs compared to the most generous state is around $500, while the average household EITC (federal and state) benefit for a one-child household over this time period is about $1100 (all numbers in 2011 real terms). Two-child households typically receive larger EITC benefits; over this time period, the average 2-child EITC increased from $625 in 1990 to more than $2200 in 2015—a $1,600 increase in the average credit. The difference between the least generous and most generous state was also larger for two-child households, typically

around $1,000. Finally, the variation in simulated EITC benefits for households with three or more children was the same as that of two children until 2009, when the EITC was expanded for households with at least three children, which produced an increase in average household EITC benefits of about $500 before and after the implementation of the policy change.

We match this information to our samples of single mothers by year, state, and number of children residing in the household. For a given individual in our samples, the simulated EITC benefit represents the average federal and state EITC a single mother could expect to receive given the state, year, and number of children residing in the household. In the SIPP, a $1,000 increase in the simulated benefit corresponds to a $1,041 increase in own EITC benefits among single mothers, while in the FFCWS a $1,000 increase in the simulated benefit corresponds to an $835 increase in single mothers' EITC benefits.

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.[2] We then estimate the following reduced form model:

$$(2) \quad \#_{\$} = \&_{\cdot} + \&_{)} *+,-_{238} + \&_{-} /_{\$} + \&_{0} 1_{23} + 4_{2} + 5_{3} + 6_{\$} ,$$

Here we replace own EITC benefits with simulated benefits. $*+,-_{238}$ is evaluated at the state, year, family-size level and reflects federal and state policy changes to the EITC between 1990 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

[2] In results not shown, we also test a two-year lag specification. 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.

generosity impacts housing instability 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, and results, available upon request, were substantively similar). 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:

$$(3)\quad \#_{\$} = \&_{\cdot} + \&_{)}{}^{*}+,-_{\$} + \&_{_}1_{23} + :_{\$} + 5_{3} + 6_{\$}$$

In our main analyses, we incorporate both federal and state variation in the EITC to estimate the relationship between EITC generosity and housing instability, but in supplemental models, we also partition the simulated EITC into its federal and state components. These specifications allow us to determine whether individuals respond differently to expansions at the federal level versus the state level. Focusing only on the federal variation will also assuage any concerns that expansions to state EITCs may be endogenous to housing instability measures.

Testing Mechanisms

As stated earlier, there are multiple mechanisms through which the EITC may affect housing instability. One mechanism is through the lump-sum delivery of the benefit, which may allow families to pay several months of rent in advance, or put a down payment or security

deposit on a home or apartment. Another key mechanism through which the EITC may affect housing instability is through its labor supply incentives. Increasing labor supply may lead to a reduction in housing instability through increased pre-tax earnings and improved financial status. Last, we might find reductions in doubling up either because mothers ask individuals to leave their home, or mothers move out of homes shared with others to live independently. The first phenomenon implies improved economic standing, but the second, where mothers form their own household, is representative of both improved economic wellbeing but also likely increased housing stability as living in someone else's home is more precarious than your own home. To examine these mechanisms we conduct a few tests.

First, to test whether the lump-sum nature of the benefit may reduce housing instability, we separately analyze our results according to the month of the interview. If the lump sum benefit helps families pay several months of rent in advance or make a down payment on a new home or apartment, we might expect to find larger reductions in housing instability during tax season (although this may still be the case outside of tax season). We run the simulated benefits analysis examining families who were interviewed in February as compared to all other months. According to the US Treasury's Monthly Treasury Statement, approximately 60% of EITC outlays in recent years are distributed in February. Because we do not know exactly when households receive their tax refunds, we also conduct the analysis separately grouping February, March, and April against all other months.

Second, to test whether reductions in housing instability are explained by labor supply and thus increased income, we examine labor supply and income responses as a function of EITC generosity. We first replicate the long line of EITC research showing a positive relationship between EITC generosity and labor supply of single mothers. We then use our

simulated EITC benefit as an instrument for pre-tax earnings (plus EITC benefits) to estimate the relationship between income and housing instability. We estimate the IV using two-stage least-squares, estimating the first stage as:

$$(4)\quad \text{+<=>?@}_{\$} = \&_{\cdot} + \&_{)}\text{*+,-}_{238} + \&_{-}\text{/}_{\$} + \&_{0}1_{23} + 4_{2} + 5_{3} + 6_{\$}$$

Where *+,-_{238} is used as an instrument for pre-tax income, $\text{+<=>?@}_{\$}$. We then use the predicted value of income estimated in the first stage in our second-stage equation:

$$(5)\quad \#_{\$} = \&_{\cdot} + \&_{)}\widehat{\text{+<=>?}}\text{@}_{\$} + \&_{-}\text{/}_{\$} + \&_{0}1_{23} + 4_{2} + 5_{3} + 6_{\$}$$

This model exploits the desired variation in the EITC measure (federal and state policy changes) as well as the labor supply effects of changes to the EITC, removing the undesired, endogenous variation in the EITC due to unobserved characteristics. Equation (5) will thus indicate how a $1,000 increase in income, as generated by policy changes to the EITC, impacts housing instability.

Last we run the simulated benefits model replacing our outcome with a measure indicating whether the mother (or the mother's partner) is the person named on the lease if the home is rented or the mortgage if it is an owned home. Although both forms of doubling up represent a form of housing instability, living in someone else's home is more precarious, resulting in a higher likelihood of homelessness than if you have someone living in your home (O'Toole et al. 2007). If we find no change in the likelihood that the mother reports having her name on the lease as a function of EITC generosity, it implies that most of the reductions in doubling up that we find are due to mothers no longer allowing other adults to live in their homes. On the other hand, if we find an increase in the share of mothers reporting that their names are on the lease as a function of EITC generosity, it implies that our doubling up effects

are more likely due to mothers leaving doubled-up houses to rent or buy their own apartments or homes.

Do we help those who need it most? Heterogeneity by income and education

We also conduct a number of sensitivity analyses to further understand heterogeneous treatment effects. 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. 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 & Patel, 2015). These analyses will illustrate whether the same pattern is true in terms of alleviating housing instability.

Results

Table 2 provides descriptive statistics on housing instability and the EITC measures. Housing instability is more common among the FFCWS sample than in the SIPP: 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. Eviction and homelessness in the past year were relatively uncommon (both 3%). More common was not paying rent/mortgage in the last year because of a lack of money, 16%. Imputing family EITC benefits using TAXSIM, 68% of mothers are eligible for the EITC in the Fragile Families, while 56% of single mothers were eligible in the SIPP. FFCWS mothers have slightly higher EITC benefits than SIPP mothers ($1650 vs. $1420) and similarly have slightly higher simulated benefits ($1,870) than SIPP mothers ($1,520).

Does One's Own EITC Predict Housing Instability?

In Table 3, we show the results from the naïve model, regressing each of the housing stability measures on mother's own imputed EITC. 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 0.2-0.3 percentage point decrease in the likelihood that a mother will be homeless. We also find that having a larger EITC is associated with an increase in not paying rent or mortgage (0.008 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 expect. 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 suggests 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 endogeneity 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.

Table 4 presents results from the reduced-form model using simulated EITC benefits rather than mother's own imputed EITC. 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. Here we present the fully controlled models (Models 4 and 5; without and with individual fixed effects), but we present the models adding in levels of controls in Appendix Table 2. In both FFCWS and the SIPP, the reduced form models suggest a strong, negative relationship between EITC generosity and doubling up. We find that a $1,000 increase in the EITC reduces doubling up by 2.7 percentage points in the SIPP and by nearly 5 percentage points in the FFCWS. Effect sizes are substantively similar after including individual fixed effects in the FFCWS (-4.0 pp), but are less precisely measured.

For average number of moves per year in the FFCWS, 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, and not paying rent or mortgage in the FFCWS, we found no significant impact of the EITC. Together, these results suggest that the EITC reduces the likelihood of doubling up among single mothers, but does little to reduce more extreme forms of housing instability like eviction and homelessness.

In results not shown, we conducted a few sensitivity analyses relating to the sample. First, we ran all of our analyses excluding women living in public housing from the sample, as these women are not supposed to double up and results were largely unchanged. Second, we ran all the analyses for the FFCWS on a balanced panel, restricting to only mothers who were interviewed in all survey waves and again, the findings were very similar. Finally, we also conducted the analyses in the SIPP on just the 1996-2008 panels to both facilitate comparisons

with the FFCWS and to avoid the concern of having to impute cohabiting partners in the 1990-1993 SIPP panels. Results were quite similar and available upon request.

Alternate Specifications – Federal versus State and IV Estimates

In Table 5, we partition our treatment variable into its federal and state components to determine whether there are differential responses to EITC generosity at the state versus federal level. We present these results as there may be concerns that variation in state EITCs may not be exogenous with respect to housing instability. 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. Isolating the variation in the simulated benefit that is due to federal expansions alleviates this concern. To test whether individuals respond similarly to state expansions as federal expansions, we then isolate the proportion of the variation in the simulated EITC generated by state EITCs. For simplicity, we only report findings for doubling up but the same analyses for the other outcome variables are available in Appendix Table 3.

The first row in Table 5 replicates the results from the reduced form specification in Table 4. 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. 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 federal and state variation. It is important to note, however, that the SIPP and FFCWS are exploiting different sources of federal variation. Since FFCWS begins after the large federal expansion in the early 1990s, the only federal expansion in the FFCWS is the expansion for three-plus child households in 2009. In the SIPP, on the other hand, the federal variation is coming from both the large expansion in the early 1990s, as well as the

expansion for three-plus child households in 2009. While the effect sizes vary between the two samples, these federal variation-only results alleviate concerns that results are driven solely by potentially endogenous state variation in the EITC.

The third row of Table 5 illustrates that relying solely on state variation in the simulated EITC produces substantively similar results in terms of reductions in doubling up rates as the federal variation. A $1,000 increase in the average state EITC benefit leads to a 5.7 percentage point decline in the likelihood of doubling up among single mothers in the SIPP and a 4.1 percentage point decline in the FFCWS. These are large point estimates, 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 1.7 percentage point decline in doubling up in the SIPP and a 1.1 percentage point decline in the FFCWS (though not statistically significant).

Mechanisms: Lump-sum Effects, Income Effects and Moving Out

Results presented thus far provide evidence that the EITC reduces the likelihood of doubling up among single mothers. We next test several mechanisms that could potentially explain how the EITC reduces this form of housing instability. First, we consider whether the EITC reduces housing instability through its lump-sum nature at tax time that may allow households to put down a security deposit on a new apartment, or pay several months of rent in advance. If this is the case, then we might expect to see reductions in doubling up primarily in tax season, around the time that households receive their tax refunds (although certainly households may save this lump sum for use later in the year).

Results of this analysis, shown in Table 6, are mixed. In both the SIPP and FFCWS, we find larger point estimates of reductions in doubling up as a function of EITC generosity when

we separately analyze doubling up in February (5.4 percentage point decline in the SIPP and 7.7 percentage point decline in the FFCWS) compared to the rest of the year (2.4 percentage point decline in the SIPP and 4.5 percentage point decline in the FFCWS). However, the sample sizes in February alone are quite small when we make this restriction, so we do not find a statistically significant relationship between the EITC and doubling up. When we compare tax season (Feb-April), we again see larger, but not significant point estimates in the FFCWS, but for SIPP they are similar in both tax and non-tax season. We also examined differences in average number of moves in this time period and find a higher number of moves (0.1) during February but a lower number of moves in other months (-.07), and a similar but weaker pattern in tax season in the FFCWS. This suggests that a move may be more common shortly after receiving a tax return, supporting the hypothesis that EITC recipients use tax refunds to put down security deposits on new apartments and are subsequently less likely to move the rest of the year. Together, these results provide suggestive evidence that doubling up decreases more around tax season, but since we continue to find results throughout the rest of the year, it is unlikely that results are driven entirely by the lump-sum nature of the EITC.

To test whether the EITC reduces housing instability through its effect on pre-tax income, we first replicate previous findings that demonstrate the EITC increases labor supply among single mothers (see Table 7). Confirming prior research, we find a 10-percentage point increase in the labor supply of single mothers following a $1,000 increase in the average household EITC benefit in the SIPP (Panel A, Table 7). Results are much more modest in the FFCWS, but are quite similar to the SIPP results if we exclude single mothers with young children from the sample (results available upon request). We then use the simulated EITC as an instrument for pre-tax (but including imputed EITC benefits) family income to test whether the reduction in

doubling up can be explained by increases in pre-tax family income. In the SIPP, we find that a $1,000 increase in the average household EITC benefits leads to a $4,750 increase in pre-tax family income (Panel B, Table 7). Again, results are more modest in the FFCWS, but still strong: a $1,000 increase in average household EITC benefits leads to a $2,690 increase in pre-tax family income. In both datasets, these large increases in pre-tax family income correspond to significant declines in the likelihood of doubling up. A $1,000 increase in pre-tax family income leads to a 0.6 percentage point decline in the likelihood of doubling up in the SIPP and a 1.8 percentage point decline in the likelihood of doubling up in the FFCWS. These results suggest that one of the primary mechanisms through which the EITC reduces the likelihood of doubling up is through increases in pre-tax family income.

Last, to further explore how the EITC reduces doubling up, we look at types of doubling up (Panel C, Table 7). As noted earlier, our definition of doubling up encompasses two types of individuals: those who are living in someone else's home (61% of doubled up FFCWS mothers) and those who are allowing others to live in their home (39%). We might find a reduction in doubling up either because individuals move out of others' homes and into their own homes, or individuals no longer allow other adults to live in their homes (because they no longer have a financial need for them). Using data on whether the mother (or the mother's partner) is named on the lease or mortgage, we regress this indicator on our simulated EITC benefit. Results from this analysis indicate that mothers move out of doubled up houses. We find that a $1,000 increase in the average household EITC benefit leads to a 5.2 percentage point increase in the likelihood that the mother reports having her name on the mortgage or lease. The results are relatively consistent when we include individual fixed effects (4.8 percentage point increase). The magnitude of this effect is almost identical to the size of the decline in the share of mothers doubling up (Table 4),

suggesting that the majority of the doubling up effect that we uncover is due to mothers leaving doubled-up houses for their own houses.

Does the EITC Help Those Who Need it Most? Heterogeneity by Income and Education

Housing instability is most common among families on the lower end of the income and education distribution. Yet EITC benefits are tied to earnings, so single mothers with little or no earnings, arguably those with the most need, are unlikely to see reductions in housing instability as a function of EITC generosity. Mothers with very low incomes (below $13,000) are also not required to file taxes, so would not receive the EITC. [3] To examine whether this is the case we present results stratifying our samples by income as a percent of poverty (Table 8). We expect that there will be no link between the EITC and housing instability for mothers at the bottom of the income distribution and similarly towards the top as mothers with earnings above 233% of poverty are no longer eligible for the EITC.

We present our findings on doubling up in Table 8, but analyses for the other outcomes are available in Appendix Table 4. Consistent with earlier research (Hoynes & Patel, 2015), we find the largest effect of an increase of the EITC on 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 6.8 percentage points less likely to double up and those with incomes from 100-200% of poverty were 6.5 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

[3] In 2016, filers were not required to file 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

poverty were less likely to double up, but the coefficients were much smaller and not statistically significant.

Variation in the effect of the EITC on housing instability by income is expected given the structure of the EITC itself, but one might be concerned that income is endogenous to EITC policy.[4] Another way to proxy for income is to examine differences by education, which is less likely to respond to changes in EITC policy or doubling up. In Table 8, we also present the analyses examining the effect of the simulated EITC on doubling up, stratifying by 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. In the SIPP, we find a $1000 increase in the EITC decreased doubling up by 6.6 percentage points among mothers with a high school degree. We find no significant impacts of the EITC on doubling up for those with less than a high school degree (1.1 percentage point increase) or those with some college or more. For the FFCWS, a $1,000 increase in the EITC decreases doubling up by 9.4 percentage points for high school educated mothers. Similarly, we see some potential evidence that for mothers with less than a high school degree and some college, but the associations were not significant. Last, it is worth noting that the analysis suggests that the EITC is associated with a 16 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).[5] Overall, our results confirm prior findings that the EITC is most likely to benefit individuals with income just below or just above the federal poverty line (Hoynes & Patel 2015).

[4] In results not shown, we also examined heterogeneity by income in the first wave of the SIPP/FFCWS to reduce concerns of endogeneity. Results were similar and available upon request.
[5] Results were similar in both samples when college-educated mothers were excluded from the analysis altogether.

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 doubling up among single mothers. We find 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, which corresponds to a 7-14% reduction in the number of moves made in a year in the FFCWS. 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 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 receiving the credit in our sample is about $2,400. If we consider an expansion 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 of

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 & Maurin, 2005; Solari & Mare, 2012; Low, Hallett & Mo, 2016; Lopoo & London, 2016; Metzger et al., 2015) and increased vulnerability to adverse experiences (Edin & Shaefer, 2015).

In terms of mechanisms, we find evidence that the reductions in doubling up are primarily due to single mothers moving out of doubled-up housing and into their own homes, as evident by an increase in the share of mothers reporting having their names on the lease as a function of EITC generosity. This is in keeping with earlier studies of the elderly and preferences for independent living (e.g. Engelhardt, Grubery & Perry, 2005), but it also suggests the reductions in doubling up we observe are largely driven by mothers moving to more stable housing. When we separately analyze results based on whether the interview took place in tax season or not, we find some evidence that reductions in doubling up are larger in tax season, although we continue to find significant reductions in interview months not in tax season as well. We find more support for the labor supply hypothesis: we find large increases in labor supply and pre-tax income as a function of EITC generosity, and this increase in pre-tax income also leads to reductions in the likelihood of doubling up. This finding is in line with previous work that suggests that much of the anti-poverty effects of the EITC are due to the labor supply incentives rather than the benefit itself (Hoynes & Patel, 2015).

In line with the labor supply hypothesis, in examining patterns by income and educational attainment, we find that effects are concentrated among single mothers with earnings between

50-200% of the federal poverty line, and among single mothers with a high school degree. These findings are not surprising since 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 is 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. Our analysis also assumes that single mothers in our sample claim all of the children that are residing in the household; it is possible that other family members or non-resident fathers attempt to claim one or all of the children to maximize household tax refunds. This can be particularly complicated if more than one adult is eligible to claim the children residing in the household, say through shared custody agreements among separated or divorced parents. If other family members are claiming any of the children residing in the household, this would result in measurement error, biasing our estimates towards zero.

A related concern is that we use imputed EITC benefits in our analyses, since reporting of EITC receipt is often quite poor in household surveys. While EITC claiming tends to be high, over 80%, there are likely some single mothers in our sample who do not file their taxes or do not claim the EITC when they do file. We would thus attribute a non-zero EITC benefit to some households that do not, in fact, receive the EITC. This would again result in measurement error in our estimates, biasing our estimates towards zero.

Another issue of concern is whether the composition of single mothers itself is affected by the EITC, which may at least partially explain the reductions in housing instability that we

uncover. For instance, if more advantaged single mothers are less likely to marry as a function of EITC generosity, we may find a reduction in doubling up that is driven by this change in the composition of single mothers. Previous research has found the effect of the EITC on marriage to be small (Dickert-Conlin & Houser, 2002; Herbst, 2011; Fisher, 2012; Michelmore, 2017); the magnitude of our results are likely too large to be completely explained by marriage effects. Another possibility is that the EITC may encourage cohabitation, which may have an indirect effect on doubling up. If the EITC does induce more couples to cohabit, that might be one mechanism through which we find a reduction in doubling up—individuals may move in with their partners rather than other individuals such as family members or friends. In results not shown but available upon request, we find no evidence that the single mothers in our sample are more likely to cohabit as a function of EITC generosity. This suggests that our results cannot be explained by a rise in cohabitation that, in turn, reduces the likelihood that single mothers live with other family members or friends.

This research suggests that expansions to the EITC may help reduce housing instability, especially in the form of doubling up. We do not find evidence that these effects are driven by compositional changes in the sample of single mothers, but rather our results point to improved economic circumstances as a function of EITC generosity. Following a $1,000 policy-induced increase in the average household EITC, earnings among single mothers increase by as much as $4,750, and rates of doubling up decline by about 3-5 percentage points. 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.

References

Bastian, J. & Michelmore, K. Forthcoming. The long-term impact of the Earned Income Tax Credit on children's education and employment outcomes. Journal of Labor Economics.

Baughman R, Dickert-Conlin S, Houser S. (2002). How well can we track cohabitation using the SIPP? A consideration of direct and inferred measures. Demography. 39 455–465

Berger, L. M., Font, S. A., Slack, K. S., & Waldfogel, J. (2016). Income and child maltreatment in unmarried families: evidence from the earned income tax credit. Review of Economics of the Household, 1–28.

Bratt, R. G. (2002). Housing and family well-being. Housing Studies, 17, 13–26.

Buckner, J. C., Bassuk, E. L., Weinreb, L. F., & Brooks, M. G. (1999). Homelessness and its relation to the mental health and behavior of low-income school-age children. Developmental Psychology, 35, 246.

Bulman, G & Hoxby, C. (2015). The Returns to the Federal Tax Credits for Higher Education. NBER Working Paper No. 20833.

Burgard, S., Seefedt, K. & Zelner, S. (2012). Housing instability and health: Findings from the Michigan recession and recovery study. Social Science and Medicine.

Center for Budget and Policy Priorities. (2016). Policy basics the Earned Income Tax Credit. http://www.cbpp.org/research/federal-tax/policy-basics-the-earned-income-tax-credit

Cohodes, S., Grossman, D. Kleiner, S. & Lovenheim, M. (2014). The Effect of Child Health Insurance Access on Schooling: Evidence from Public Insurance Expansions. NBER working paper 20178.

Currie, Janet. 2004. The take up of social benefits. NBER Working Paper No. 10488.

Currie, J. & Gruber, J. (1996). Health insurance eligibility, utilization of medical care, and child health. The Quarterly Journal of Economics, 111, 431–466.

Curtis, M. A., & Warren, E. J. (2016). Child support receipt, mobility, and housing quality. Housing Studies, 31, 672–693.

Dahl, M., DeLeire, T & Schwabish, J. (2009). Stepping stone or dead end? The effect of the EITC on earnings growth. IZA Discussion Paper No.4146.

Dahl, G.B. & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. American Economic Review 102, 1927–1956.

Desmond, M. (2016). Evicted: Poverty and profit in the American city. Crown

Desmond, M. and Gershenson, C. (2016). Housing and employment insecurity among the working poor. Social Problems.

Desmond, M., & Kimbro, R. T. (2015). Eviction's fallout: housing, hardship, and health. Social Forces, 044.

Dickert-Conlin, S., & Houser, S. (2002). EITC and Marriage. National Tax Journal, 25—40.

Edin, K. J., & Shaefer, H. L. (2015). $2.00 a day: Living on almost nothing in America. Houghton Mifflin Harcourt.

Eissa, N. & Liebman, J. (1996). Labor supply response to the earned income tax credit. Quarterly Journal of Economics 111, 605–637.

Ellwood, D. T. (2000). The impact of the Earned Income Tax Credit and social policy reforms on work, marriage, and living arrangements. National Tax Journal, 53, 1063–1105.

Engelhardt, G. V., Gruber, J., & Perry, C. D. (2005). Social security and elderly living arrangements evidence from the social security notch. Journal of Human Resources, 40, 354–372.

Evans, W., Sullivan, J., & Wallskog, M. (2016). The impact of homelessness prevention programs on homelessness. Science, 353, 6300.

Fisher, H. (2013). The effect of marriage tax penalties and subsidies on marital status, Fiscal Studies 34, 437– 465.

Geller, A., & Curtis, M. A. (2011). A sort of homecoming: Incarceration and the housing security of urban men. Social Science Research, 40, 1196–1213.

Geller, A., & Franklin, A. W. (2014). Paternal incarceration and the housing security of urban mothers. Journal of Marriage and Family, 76, 411–427.

Gilman, S. E., Kawachi, I., Fitzmaurice, G. M., & Buka, S. L. (2003). Socio-economic status, family disruption and residential stability in childhood: relation to onset, recurrence and remission of major depression. Psychological Medicine, 33, 1341—1355.

Goux, D., & Maurin, E. (2005). The effect of overcrowded housing on children's performance at school. Journal of Public Economics, 89, 797–819.

Halpern-Meekin, S., Edin, K., Tach, L. & Sykes, J. (2014). It’s not like I’m poor: How working families make ends meet in a post-welfare world. University of California Press. Oakland, California.

Herbst, C. M. (2011). The impact of the Earned Income Tax Credit on marriage and divorce: Evidence from flow data. Population research and Policy review, 30, 101—128.

Hoynes, H.W. & Patel, A.J. 2015. Effective policy for reducing inequality? The earned income

tax credit and the distribution of income. Working Paper no. 21340, National Bureau of Economic Research.

Internal Revenue Service (2016). 2015 EITC income limits, maximum credit amounts and tax law updates. https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-income-limits-maximum-credit-amounts

Joint Center for Housing Studies Harvard. (2016). The state of the nations housing. http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs_2016_state_of_the_nations_housing_lowres.pdf

Jones, Lauren and Katherine Michelmore. 2015. Timing is money: Does lump-sum payment of tax credits induce high-cost borrowing? Working paper, University of Michigan.

Jones, L. E., Milligan, K. S., & Stabile, M. (2015). Child cash benefits and family expenditures: Evidence from the National Child Benefit (No. w21101). National Bureau of Economic Research.

King, C. (2016). Food insecurity and housing instability in vulnerable families. Review of Economics of the Household, 1—19.

Kushel, M. B., Gupta, R., Gee, L., & Haas, J. S. (2005). Housing instability and food insecurity as barriers to health care among low-income Americans. Journal of General Internal Medicine, 21, 71–77.

Lee, B. A., Tyler, K. A., & Wright, J. D. (2010). The new homelessness revisited. Annual Review of Sociology, 36, 501.

Leopold, J., Getsinger, L., Blumenthal, P., Abazajian, K., & Jordan, R. (2015). The housing affordability gap for extremely low-income renters in 2013.Washington, DC: Urban Institute.

Leventhal, T., & Newman, S. (2010). Housing and child development. Children and Youth Services Review, 32, 1165-1174.

Lopoo, L. M., & London, A. S. (2016). Household crowding during childhood and long-term education outcomes. Demography, 53, 699-721.

Low, J. A., Hallett, R.E., & Mo, E. 2016. Doubled-up homeless: Comparing educational outcomes with low-income students. Education and Urban Society 1-19.

Masten, A. S., Sesma, A, Jr, Si-Asar, R., Lawrence, C., Miliotis, D., & Dionne, J. A. (1997). Educational risks for children experiencing homelessness. Journal of School Psychology, 35, 27–46.

Metzger, M.W., Fowler, P.J., Anderson, C.L., & Lindsay, C.A. 2015. Residential mobility during adolescence: Do even “upward” moves predict dropout risk? Social Science Research. 53: 218-230.

Meyer, B. & Rosenbaum, D.T. (2001). Welfare, the Earned Income Tax Credit, and the labor supply of single mothers. The Quarterly Journal of Economics 116, 1063– 1114.

Michelmore, K. Forthcoming. The Earned Income Tax Credit and union formation: The impact of expected spouse earnings. Review of Economics of the Household.

Milligan, K. & Stabile, M. (2011). Do child tax benefits affect the well-being of children? Evidence from Canadian child benefit expansion. American Economics Journal: Economic Policy, 3, 175-205.

Moore, J. 2008. Seam bias in the 2004 SIPP panel: Much improved, but much bias still remains. Survey Methodology Research Report no. 3, US Census Bureau, Statistical Research Division, Washington, DC.

Mykyta, L., & Macartney, S. (2011). The effects of recession on household composition: 'doubling up' and economic well-being. US Census Bureau. Social, Economic and Household Statistics Division Working Paper, 4.

National Alliance to End Homelessness. (2016). The state of homelessness in America. http://endhomelessness.org/wp-content/uploads/2016/10/2016-soh.pdf

National Center for Homeless Education. 2011. Education for homeless children and youth program: Data collection summary. Washington, DC: National Center for Homeless Education. http://nche.ed.gov/downloads/data-comp-0910-1112.pdf

O'Toole, T. P., Conde-Martel, A., Gibbon, J. L., Hanusa, B. H., Freyder, P. J., & Fine, M. J. (2007). Where do people go when they first become homeless? A survey of homeless adults in the USA. Health and Social Care in the Community, 15, 446-453.

Phinney, R., Danziger, S., Pollak, H. & Seefeldt, K. (2007). Housing instability among current and former welfare recipients. American Journal of Public Health.

Pilkauskas, N. V., Garfinkel, I., & McLanahan, S. S. (2014). The prevalence and economic value of doubling up. Demography, 51, 1667–1676.

Scholz, J.K.. (1994). The Earned Income Tax Credit: Participation, compliance, and antipoverty effectiveness. National Tax Journal, 47, 63–87.

Shaefer, L., Song, X., Shanks, T. (2013). Do single mothers in the United States use the Earned Income Tax Credit to reduce unsecured debt? Review of Economics of the Household, 11, 659–680.

Sharkey, P., & Sampson, R. J. (2010). Destination effects: Residential mobility and trajectories of adolescent violence in a stratified metropolis. Criminology, 48, 639–681.

Solari, C. D., & Mare, R. D. (2012). Housing crowding effects on children's wellbeing. Social science research, 41, 464–476.

Sugalia, S. F., Duarte, C. S., & Sandel, M. T. (2011). Housing quality, housing instability, and maternal mental health. Journal of Urban Health, 88, 1105–1116.

Tax Policy Center. 2006. EITC distribution by filing status, 2000, 2003. http://www.taxpolicycenter.org/statistics/eitc-distribution-filing-status-2000-2003. Retrieved 8/14/17.

United States Department of the Treasury, Financial Management Service. Various Issues, "Monthly Treasury Statement."

Warren, E. & Font, S. (2015). Housing insecurity, maternal stress and child maltreatment: An application of the family stress model. Social Service Review

Wood, D. L., Valdez, R. B., Hayashi, T., & Shen, A. (1990). Health of homeless children and housed, poor children. Pediatrics, 86, 858–866.

Wright, B.R., Caspi, A. Moffit, T.E., & Silva, P. (1998). Factors associated with doubled-up housing – A common precursor to homelessness. Social Service Review, 72, 92–111.

Ziol-Guest, K. M., & McKenna, C. C. (2014). Early childhood housing instability and school readiness. Child development, 85, 103–113.

Table 1: Sample characteristics, FFCWS & SIPP

	FFCWS		SIPP	
	Mean	(SD)	Mean	(SD)
Demographic Characteristics of Mothers				
Monthly earnings ($)	1384	(1440)	1510	(2241)
Income as % of poverty	0.93	(1.17)	1.15	(1.26)
Age	24.01	(5.66)	35.92	(8.61)
Number of children	2.04	(.83)	1.79	(0.99)
Education				
Less than HS	0.44		0.17	
HS degree	0.29		0.31	
Some College	0.23		0.39	
College degree	0.04		0.13	
Race/Ethnicity				
Non-Hispanic White	0.14		0.51	
Non-Hispanic Black	0.59		0.31	
Hispanic	0.25		0.15	
Other	0.02		0.04	
State/Year Contextual Factors				
Unemployment rate (year)	5.16	(1.29)	5.59	(1.60)
Top tax	4.82	(3.14)	5.20	(3.29)
State GDP (logged millions of dollars)	13.11	(0.67)	12.64	(0.97)
Max benefit (monthly hundreds of dollars)	4.32	(1.62)	4.06	(1.63)
N	12,276		134,175	

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Note: FFCWS is pooled, person-years covering tax years 1998-2015, single mothers only. SIPP sample is at the person-month and restricted to mothers aged 18-65 and to the reporting month (month 4 covering tax years 1989-2012. All dollars are in 2011 real terms.

Table 2: Housing instability and EITC descriptive statistics, FFCWS & SIPP

	FFCWS		SIPP	
	Mean	(SD)	Mean	(SD)
Housing Instability				
Doubled up in current month	0.28		0.17	
Average number moves/year	0.44		0.40	
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	0.68		0.56	
Own EITC benefit (taxsim, in thousands)	1.65	(1.78)	1.42	(1.68)
Simulated EITC benefit (in thousands)	1.87	(0.51)	1.52	(0.49)
Simulated federal EITC benefit (in thousands)	1.72	(0.41)	1.46	(0.44)
Simulated state EITC benefits (% of federal)	0.15	(0.13)	0.06	(0.15)
N	12,276		134,175	

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Note: FFCWS is pooled, person-years covering tax years 1998-2015, single mothers only. SIPP sample is at the person-month and restricted to mothers aged 18-65 and to the reporting month (month 4 covering tax years 1989-2012. All dollars are in 2011 real terms.

Table 3: Housing insecurity and the EITC - own EITC (naiive) analyses

	Model 1	Model 2	Model 3	Model 4	Model 5
SIPP					
Doubled Up					
Own EITC	-0.002+	-0.002	-0.001	-0.001	
	(0.001)	(0.001)	(0.001)	(0.001)	
Observations			134,175		
Average # of Moves/Year					
Own EITC	0.008***	0.006**	0.001	0.001	
	(0.002)	(0.002)	(0.001)	(0.002)	
Observations			134,175		
FFCWS					
Doubled Up					
Own EITC	-0.012**	-0.004	0.000	0.000	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Observations			12,273		
Number of individuals					3,710
Average # of Moves/Year					
Own EITC	-0.002	-0.003	0.005	0.004	0.003
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Observations			12,248		
Number of individuals					3,707
Evicted					
Own EITC	0.002	0.001	0.001	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations			12,255		
Number of individuals					3,708
Homeless					
Own EITC	-0.003**	-0.003***	-0.003***	-0.003***	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations			12,264		
Number of individuals					3,709
Did Not Pay Rent/Mortgage					
Own EITC	0.010**	0.009**	0.007*	0.008*	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Observations			12,116		
Number of individuals					3,691
Demographic & Contextual Controls		X	X	X	X
Year FE			X	X	X
State FE				X	
Individual FE					X

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.

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 of 2011$.

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

Table 4: Housing insecurity and the EITC - simulated instrument analyses

SIPP		
	(1)	(2)
Doubled Up		
Simulated EITC	-0.027*	
	(0.01)	
Observations	134,175	
Average # of Moves/Year		
Simulated EITC	-0.003	
	(0.008)	
Observations		
FFCWS		
	(1)	(2)
Doubled Up		
Simulated EITC	-0.049**	-0.040+
	(0.014)	(0.021)
Observations	12,276	
Number of individuals		3,710
Average # of Moves/Year		
Simulated EITC	-0.058*	-0.037
	(0.025)	(0.029)
Observations	12,248	
Number of individuals		3,707
Evicted		
Simulated EITC	-0.004	0.002
	(0.007)	(0.009)
Observations	12,255	
Number of individuals		3,708
Homeless		
Simulated EITC	-0.009	-0.002
	(0.008)	(0.008)
Observations	12,264	
Number of individuals		3,709
Did Not Pay Rent/Mortgage		
Simulated EITC	0.016	0.029+
	(0.012)	(0.018)
Observations	12,116	
Number of individuals		3,691
Demographic & Contextual Controls	X	X
Year FE	X	X
State FE	X	
Individual FE		X

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Notes: All models include demographic and contextual characteristics, state and year fixed effects except the individual fixed effects, which excludes state. EITC is in thousands of 2011$.
+ p<.10; * p<.05; ** p<.01; *** p<.001

Table 5: Alternative specifications of the EITC

	SIPP	FFCWS	
Doubled up			
Simulated EITC	-0.027*	-0.047**	-0.038+
	(0.01)	(0.014)	(0.022)
Simulated EITC (federal variation only)	-0.026*	-0.058**	-0.051*
	(0.012)	(0.016)	(0.025)
Simulated EITC (state variation only)	-0.057*	-0.041	-0.020
	(0.028)	(0.054)	(0.054)
Demographic & Contextual Controls	X	X	X
Year FE	X	X	X
State FE	X	X	
Individual FE			X
Observations	134,175	12,276	
Number of individuals			3,710

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Notes: All models include demographic and contextual characteristics, state and year fixed effects except the individual fixed effects, which excludes state. EITC is in thousands of 2011$.
+ p<.10; * p<.05; ** p<.01; *** p<.001

Table 6. Testing the lump sum payment as a mechanism: do we see more response in tax season?

	February Interview	All Other Months	Tax Season (Feb, March, April)	Not Tax Season
		SIPP		
Doubled Up	-0.054	-0.024*	-0.021	-0.027*
Simulated EITC	(0.034)	(0.01)	(0.027)	(0.012)
Observations	10,079	124,096	23,800	110,375
Avg. # of Moves	-0.020	-0.003	-0.033**	-0.002
Simulated EITC	(0.02)	(0.008)	(0.01)	(0.009)
Observations	10,079	124,096	23,800	110,375
		FFCWS		
Doubled Up	-.077	-.0456**	-0.058	-.043**
Simulated EITC	(0.110)	(0.013)	(0.038)	(0.012)
Observations	735	11,541	2,775	9,501
Avg. # of Moves	0.099	-0.070*	0.022	-0.082*
Simulated EITC	(0.054)	(0.027)	(0.036)	(0.032)
Observations	732	11,516	2,771	9,477

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Notes: All models include demographic and contextual characteristics, state and year fixed effects. EITC is in thousands of 2011$.
+ p<.10; * p<.05; ** p<.01; *** p<.001

Table 7. Testing employment, income and moves out of other's homes as mechanisms

	SIPP	FFCWS	
Panel A: EITC and employment			
	(1)	(1)	(2)
Simulated EITC	0.102***	0.035	0.023
	(0.018)	(0.031)	(0.022)
Observations	134,175	12,253	
Number of Individuals			3,709
Panel B: IV estimation of doubling up on family income			
Instrument for income + EITC with simulated EITC	-0.006*	-.018*	
	(0.002)	(.0088)	
First Stage	4.75**	2.69**	
	(1.28)	(0.87)	
F-Statistic	13.81	9.58	
Observations	134,175	12,253	
Panel C:EITC and likelihood of being on the lease/deed [a]			
Simulated EITC		0.052*	0.048*
		(0.021)	(0.023)
Among doubled-up %:			
Owner/lessee		0.39	
Not owner/lessee		0.61	
Observations		9,174	
Number of individuals			3,455
Demographic & Contextual Controls	X	X	X
Year FE	X	X	X
State FE	X	X	
Individual FE			X

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.

Notes: All models include demographic and contextual characteristics, state and year fixed effects except the individual fixed effects, which excludes state. EITC is in thousands of 2011$. [a] Sample covers years 2001-2015, measure not collected at first survey wave.

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

Table 8: EITC and doubling up - by mother's income as a percent of poverty & education

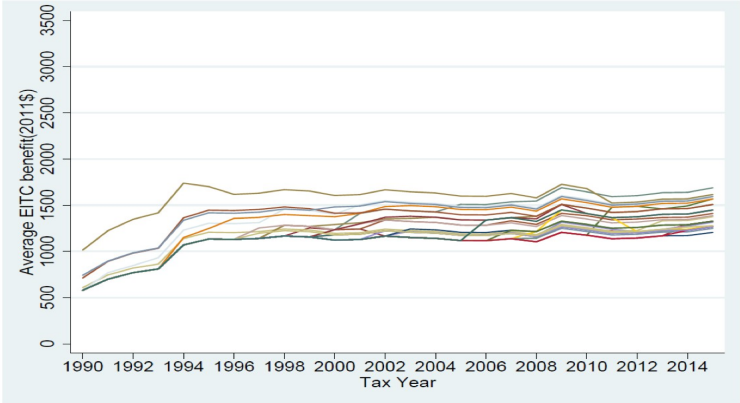
	Mother's Income as a % of Poverty				Mother's Educational Attainment			
Doubled Up	<50%	50-99%	1-199%	200+%	<High School	High School	Some College	College or greater
				SIPP				
Simulated EITC	-0.01	-0.068*	-0.065**	-0.028	0.011	-0.066**	-0.026	-0.013
	(0.02)	(0.028)	(0.021)	(0.022)	(0.035)	(0.019)	(0.017)	(0.032)
Observations	54,449	21,264	31,390	27,072	23,543	43,195	50,574	16,863
				FFCWS				
Simulated EITC	-0.03	-0.05	-0.13**	-0.01	-0.035	-0.094*	-0.044	0.161
	(0.03)	(0.05)	(0.04)	(0.05)	(0.027)	(0.038)	(0.039)	(0.129)
Observations	5,316	2,185	3,017	1,595	5,457	3,511	2,882	426

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.

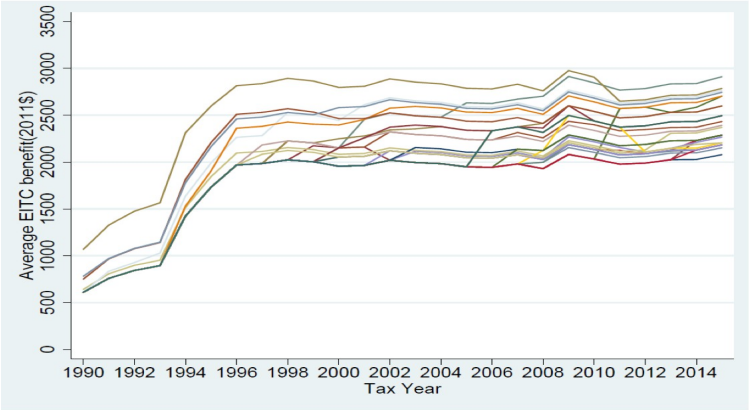
Note: Mother's income is measured at time of interview. All models include demographic and contextual characteristics, state and year fixed effects. EITC is in thousands of 2011$.

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

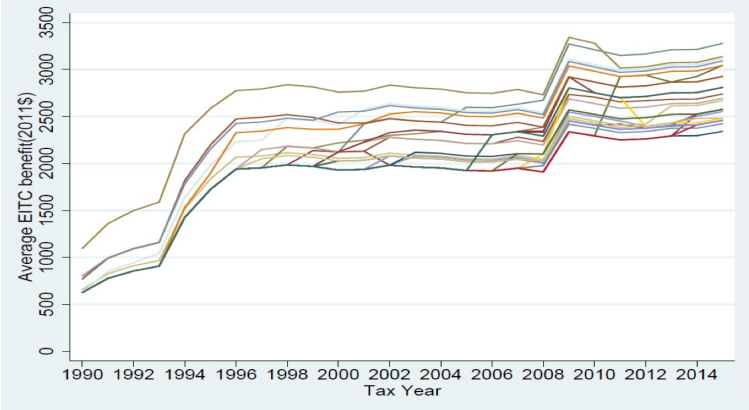
Appendix Figure 1. Variation in simulated instrument, by state and number of children



A. One child



B. Two Children



C. Three or more children

Source: Survey of Income and Program Participation 1996 Survey and NBER's TAXSIM. Single women aged 19-65 with at least one child under the age of 19 residing in the household.

Note: Average household state and federal EITC benefits from 1990-2015 in 2011$. Each line represents a separate state, federal variation is bottom line in each graph. See description of simulated instrument in the text for more details.

;"1'PENDIXTAB1f.LSDUEEITCGa"FR06l1YBYYEAR EXPRESSEDASASHARFOf l!IEFEDERALEITC

Ta1.Year	CA	co	er	DC	0£	n.	IN	IA	KS	u	ME	MD	MA	MI	1"E	NJ	i,.-y	c	Oil	OK	OR	RI	VT	ITC	Uc<	V.i(1)	\\¢ (2)	\\¢(3)
19S6																						0.22-21						
19S7																						**0.1346..**						
1988																						**0.2296..**	023					
19S9																						**0.2296..**	*015*			0.05	*025*	**0.75**
1990								*O.OS-*														**0.2296..**	*028*			0.05	*025*	**0.75**
1991								**0.065-**							0.1							**0.275..**	*028*			0.05	*015*	**0.75**
1992								**0.0-65**							0.1							**0.275..**	*028*			0.05	*015*	**0.75**
1993								**0.0-65**							**0.15**							**0.275..**	*028*			0.05	*015*	**0.75**
1994								**0.065-**							**0.15**			QO"i>				**0.275..**	*01 5*			0.0<4	0.1()8	**0.625**
1995								**0.0-65**							**0.15**			0.1				**0.275..**	*01 5*			0.04	0.16	***05***
1996								**0.0-65**							**0.15**			0.2				**0.275..**	*01 5*			0.04	**0.14**	**0.43**
1997								**0.065-**					0.1		**0.15**			0.2			**0.05"**	**0.275..**	*015*			0.04	**0.14**	**0.43**
1998								**0.0-65**	0.1			0.1	0.1		*0.25*			0.2			**0.05"**	**027..**	*015*			0.04	**0.14**	**0.43**
1999		0.005						**0.0-65**	0.1			0.1	0.1		*0.25*			0.2			**0.05"**	***0.265..***	*015*			0.04	**0.14**	**0.43**
2000		0.1		0.1		**0.05..**		**0.0-65**	0.1		*0.05*	0.15	0.1		*0.25*		0.1	Q225			**0.05"**	**0.26..**	0.32			0.04	**0.14**	**0.43**
2001		0.1		0.25		**0.05..**		**0.0-65**	0.1		*0.05*	0.16	0.15		**OJ3**		**0.15**	*0.25*			**0.05"**	**0.255..**	0.32			0.04	**0.14**	**0.43**
2002		0		0.25		**0.05..**		**0.0-65**	**0.15**		*0.05*	0.16	0.15		**OJ3**		Qli>	Q2i,			**Q05 0.05'**	**025..**	0.32			0.04	**0.14**	**0.43**
2003		0		0.25		*0.05*	0.06	**0.0-65**	**0.15**		*0.05*	0.18	0.15		**OJ3**	0.08	O.1	**OJ**			Q05 **0.05"**	*025*	0.32			0.04	**0.14**	**0.43**
2004		0		0.25		*0.05*	0.06	**0.0-65**	**0.15**		*0.05*	*01*	0.15		**OJ3**	0.08	O.1	**OJ**			Q05 **0.05"**	*025*	0.32			0.04	**0.14**	**0.43**
2005		0		0.35		*0.05*	0.06	**0.0-65**	**0.15**		*0.05*	*01*	0.15		**OJ3**	0.08	O.1	**OJ**			Q05 *0.05*	*025*	0.32			0.04	**0.14**	**0.43**
2006		0		0.35	0.2	*0.05*	0.06	**0.0-65**	**0.15**		*0.05*	*01*	0.15		**OJ3**	0.08	O.1	**OJ**			Q05 *0.05*	*025*	0.32	*01*		0.04	**0.14**	**0.43**
2007		0		0.35	0.2	*0.05*	0.06	***0.065***	0.17		*0.05*	*01*	0.15	0	**OJ3**	0.08	O.1	0.08	**OJ**		Q05 *0.05*	*025*	0.32	*01*		0.04	**0.14**	**0.43**
2008		0		0.4	0.2	*0.05*	0.06	***0.065***	0.17	**0.035**	*0.05*	*015*	0.15	0.1	**OJ3**	0.1	Q225	0.1	**OJ**	**0.035**	Q05 0.06	*025*	0.32	*01* ro		0.04	**0.14**	**0.43**
2009		0		0.4	0.2	*0.05*	0.09	***0.065***	0.17	**0.035**	*0.05*	*015*	0.15	*01*	**OJ3**	0.1	*0.25*	0.1	**OJ**	*0.05*	Q05 0.06	*025*	0.32	*01* ro		0.04	**0.14**	**0.43**
2010		0		0.4	0.2	*0.05*	0.09	***0.065***	0.18	**0.035**	*0.05*	*015*	0.15	*01*	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05*	Q05 0.06	*025*	0.32	*01* ro		0.04	**0.14**	**0.43**
2011		0	*03*	0.4	0.2	*0.05*	0.09	***0.065***	0.18	**0.035**	*0.05*	*015*	0.15	*01*	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05*	Q05 0.06	*025*	0.32	*01* ro		0.04	0.11	034
2012		0	*03*	0.4	0.2	*0.05*	0.09	***0.065***	0.18	**0.035**	*0.05*	*015*	0.15	0.06	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05*	Q05 0.06	*025*	0.32	*01* ro		0.04	0.11	034
2013		0	*03*	0.4	0.2	*0.05*	0.06	0.07	0.18	**0.035**	*0.05*	*015*	0.15	0.06	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05*	Q05 0.06	*025*	0.32	*01* ro		0.04	0.11	034
2014		0.1	0.275	0.4	0.2	0.1	0.09	**0.14**	0.17	**0.035**	*0.05*	*015*	0.15	0.06	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05* **0.05**	Q05 O.<l!	*025*	0.32	*01* ro		0.04	0.11	034
2015	**0.425**	0.1	*03*	0.4	0.2	0.1	0.09	**0.14**	**0.17**	**0.035**	*0.05*	*015*	0.15	0.06	**OJ3**	0.1	O.1	0.1	**OJ**	*0.05* **0.05**	Q05 0.06	*025*	0.32	*01* ro		0.04	0.11	034

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Appendix Table 2: Housing insecurity and the EITC - simulated instrument analyses

	Model 1	Model 2	Model 3	Model 4	Model 5
			SIPP		
Doubled Up					
Simulated EITC	-0.028***	0.006	-0.027**	-0.027*	
	(0.006)	(0.006)	(0.009)	(0.01)	
Observations			134,175		
Average # of Moves/Year					
Simulated EITC	0.076***	0.123***	-0.005	-0.003	
	(0.005)	(0.01)	(0.008)	(0.008)	
Observations			134,175		
			FFCWS		
Doubled Up					
Simulated EITC	-0.166***	-0.095***	-0.048***	-0.049**	-0.040+
	(0.013)	(0.011)	(0.011)	(0.014)	(0.021)
Observations			12,276		
Number of individuals					3,710
Average # of Moves/Year					
Simulated EITC	-0.106**	-0.135*	-0.077+	-0.058*	-0.037
	(0.031)	(0.048)	(0.038)	(0.025)	(0.029)
Observations			12,248		
Number of individuals					3,707
Evicted					
Simulated EITC	0.009**	-0.001	-0.004	-0.004	0.002
	(0.002)	(0.007)	(0.006)	(0.007)	(0.009)
Observations			12,255		
Number of individuals					3,708
Homeless					
Simulated EITC	-0.001	-0.007	-0.006	-0.009	-0.002
	(0.004)	(0.005)	(0.006)	(0.008)	(0.008)
Observations			12,264		
Number of individuals					3,709
Did Not Pay Rent/Mortgage					
Simulated EITC	0.042***	0.039*	0.017	0.016	0.029+
	(0.008)	(0.016)	(0.014)	(0.012)	(0.018)
Observations			12,116		
Number of individuals					3,691
Demographic & Contextual Controls		X	X	X	X
Year FE			X	X	X
State FE				X	
Individual FE					X

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.

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 of 2011$.

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

Appendix Table 3: Alternative specifications of the EITC - other outcome variables

	SIPP	FFCWS							
	Average # moves/year			Evicted		Homeless		Not paid rent	
Simulated EITC	-0.003	-0.062*	-0.037	-0.004	0.002	-0.009	-0.002	0.015	0.026
	(0.008)	(0.026)	(0.029)	(0.007)	(0.009)	(0.008)	(0.009)	(0.012)	(0.018)
Simulated EITC (federal variation only)	-0.006	-0.067+	-0.038	-0.003	0.005	-0.012	-0.005	0.017	0.027
	(0.008)	(0.032)	(0.034)	(0.008)	(0.011)	(0.010)	(0.010)	(0.012)	(0.021)
Simulated EITC (state variation only)	0.018	-0.062	-0.062	-0.021	-0.011	0.001	0.010	0.026	0.064
	(0.018)	(0.041)	(0.074)	(0.018)	(0.023)	(0.022)	(0.022)	(0.060)	(0.045)
Demographic Controls	X	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X	X
State FE	X	X		X		X		X	
Individual FE			X		X		X		X
Observations	134,175	12,248		12,255		12,264		12,116	
Number of individuals			3,707		3,708		3,709		3,691

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.

Notes: All models include demographic and contextual characteristics, state and year fixed effects except the individual fixed effects, which excludes state. EITC is in thousands of 2011$.

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

Appendix Table 4: EITC and housing instability - 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			
Average # of Moves/Year								
Simulated EITC	-0.004	-0.009	-0.019	-0.013	0.01	-0.003	-0.013	-0.008
	(0.011)	(0.018)	(0.014)	(0.018)	(0.013)	(0.015)	(0.011)	(0.020)
Observations	54,449	21,264	31,390	27,072	23,543	43,195	50,574	16,863
					FFCWS			
Average # of Moves/Year								
Simulated EITC	-0.10**	-0.03	-0.05	-0.02	-0.095*	-0.021	-0.075*	-0.042
	(0.03)	(0.09)	(0.05)	(0.06)	(0.039)	(0.044)	(0.031)	(0.143)
Observations	5,293	2,185	3,024	1,595	5,442	3,502	2,878	426
Evicted								
Simulated EITC	-0.02+	0.03	-0.00	0.02	-0.002	-0.001	-0.023**	0.050
	(0.01)	(0.02)	(0.02)	(0.02)	(0.010)	(0.014)	(0.008)	(0.035)
Observations	5,301	2,183	3,024	1,595	5,446	3,505	2,878	426
Homeless								
Simulated EITC	-0.02	-0.01	-0.00	0.01	-0.012	-0.009	-0.010	0.052+
	(0.01)	(0.01)	(0.01)	(0.01)	(0.012)	(0.011)	(0.010)	(0.028)
Observations	5,304	2,185	3,027	1,595	5,451	3,506	2,881	426
Did Not Pay Rent/Mortgage								
Simulated EITC	0.01	0.03	0.00	0.04	0.008	0.046**	-0.018	-0.097
	(0.02)	(0.04)	(0.02)	(0.04)	(0.024)	(0.014)	(0.042)	(0.108)
Observations	5,233	2,154	2,998	1,579	5,371	3,471	2,856	418

Sources: Fragile Families and Child Wellbeing Study (FFCWS) 1999-2016. Survey of Income and Program Participation (SIPP) 1990-2008.
Notes: Income is measured at the interview. All models include demographic and contextual characteristics, state and year fixed effects except the individual fixed effects, which excludes state. EITC is in thousands of 2011$.

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