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The Effect of Income on Housing Instability and Living Arrangements: Evidence from the Earned Income Tax Credit

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The Earned Income Tax Credit, Housing and Living Arrangements

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ABSTRACT

As rents have risen and wages have not kept pace, housing affordability has declined over the last 15 years, impacting the housing and living arrangements of low-income families (moves, eviction/homelessness, affordability, shared living arrangements/doubling up, crowding). Housing subsidies are effective in improving the housing situations among low-income families, but less than one in four eligible families receive a voucher. In this paper, we ask whether one of the largest anti-poverty programs in the United States, the Earned Income Tax Credit (EITC) affects the housing and living arrangements of low-income families. Using the Current Population Survey, the American Community Survey/decennial Census, and the Fragile Families and Child Wellbeing Study, we employ a parameterized difference-in-differences strategy to examine whether policy-induced expansions to the EITC affect the housing and living arrangements of single mothers. Results suggest that a \$1,000 increase in the EITC improves housing outcomes by reducing frequent moves, housing cost burden, the number of people in the household, and crowding. Increases in the EITC also reduce doubling up (living with additional, non-nuclear family adults) and three-generation/multigenerational coresidence, indicating that mothers prefer to live independently. Although the EITC is not an explicit housing policy, expansions to the EITC are generally linked with improved housing outcomes for single mothers and their children.

Keywords: EITC, housing instability, living arrangements, doubling up, household instability, housing

THE EARNED INCOME TAX CREDIT, HOUSING AND LIVING ARRANGEMENTS

Stable housing is crucial to the physical, emotional, and economic wellbeing of individuals and families (e.g. Bratt 2002; Leventhal and Newman 2010). Housing affordability in the U.S. has declined over the last few decades, impacting the housing and living arrangements of low-income families (Desmond 2016; Joint Center for Housing Studies [JCHS] 2017). Housing subsidies (such as section 8 vouchers) for low-income renters are effective at improving housing outcomes (e.g. Chetty et al. 2016), 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). Understanding how other poverty related public policies, such as the Earned Income Tax Credit (EITC) might affect the housing and living arrangements of low-income families with children is of vital importance. By understanding whether the EITC affects housing outcomes (e.g., mobility, instability, affordability, quality and living arrangements) we can consider whether expansions to the EITC might improve the housing of low-income families.

The EITC may affect the housing of low-income families in a number of ways. First, as one of the largest cash transfer programs in the U.S., it provides low-income families with cash that can be used on housing (an average of over \$3,000 for families with children; Center for Budget and Policy Priorities 2016). Second, the EITC has been shown to increase employment and long-term earnings (e.g., Dahl et al. 2009), which in turn may increase income, thus affecting housing and living arrangements. Last, the EITC is distributed as a lump sum payment, which may provide households with cash needed for a security deposit or the ability to pre-pay a few months of rent. Despite the EITC's potential to have a big impact on housing and living arrangements, to date, no quantitative research has examined this link.

Exploiting federal and state variation in the EITC over the last three decades, we examine

the effect of the EITC on housing outcomes and the living arrangements of single mothers. Our primary dataset is the 1990-2016 Current Population Survey (CPS), but we also use the Census/American Community Survey (ACS) and the Fragile Families and Child Wellbeing Study (FFCWS) to examine additional housing outcomes and employ different methodological approaches. Using a parameterized difference-in-differences approach, we study the following questions: 1) Do expansions to federal and state EITCs affect housing outcomes (moves, reasons for moves, being named on the lease, homelessness, eviction, cost burden) and living arrangements (doubling up, three-generation coresidence, living with relatives, living with non-relatives, crowding)? And 2) are the effects stronger for mothers with young children?

We focus our analysis on single mothers, the primary recipients of the EITC (Tax Policy Center 2006), who are most likely to experience poor housing outcomes (JCHS 2017), and whose children may be particularly vulnerable to any detrimental impacts of housing instability (e.g. Ziol-Guest and McKenna 2014). By studying whether the effects of the EITC are different for families with children under six, we can better understand how refundable tax credits affect families during a critical developmental time period (e.g. Heckman 2006; Phillips and Shonkoff 2000), when household sharing and residential instability are most common (Desmond and Perkins 2016; Pilkauskas et al 2014), the labor supply effects are most pronounced (Meyer and Rosenbaum 2001), and the impact of housing mobility may be particularly consequential (Mollborn et al. 2018).

The organization of the rest of the paper is as follows: first, we provide background information on the EITC. Next, we discuss housing outcomes and living arrangements, briefly summarizing how housing and living arrangements are linked with family wellbeing. We then hypothesize how the EITC might impact housing outcomes and living arrangements, why this

might differ for young children, and discuss prior research on the effects of the EITC on housing and living arrangements. Last, we describe the data and empirical strategy before presenting results and discussing the implications for the wellbeing of low-income single mother-headed households. Overall, this study broadens our understanding of how the EITC affects the housing and living arrangements of low-income families, potentially informing future policy proposals to further expand the credit.

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. Over the last few decades, there have been several expansions to the federal credit including increases to the phase-in rate and expanded benefits for families with two or more children. In 2009, a benefit for three or more children was introduced. Between 1975 and 2016, the maximum federal EITC grew from \$1,700 to \$6,300 (2016 dollars). The credit is fully refundable, which means that households with no tax liability can still receive the credit in the form of a tax refund.

In addition to the federal EITC, 26 states and the District of Columbia had their own EITCs as of 2016 (see 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, California, Illinois), while other large-population states do not (Texas, Florida, and Pennsylvania). 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 and most state credits are refundable. 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 implement, 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 use this federal and state variation over time to examine the link between the EITC, housing, and living arrangements.

Housing and its Consequences

Our study examines a number of housing and living arrangement measures that prior literature has linked with family and child wellbeing. First, we study residential mobility. Research suggests that if a move results in families moving to a lower poverty neighborhood, then mobility is linked with positive outcomes for kids (Sharkey and Sampson 2010), especially for younger children (Chetty et al. 2016). But a move can also represent instability. Although some research considers one move per year as a form of residential instability (e.g. Burgard et al. 2012), more frequently, residential instability is defined as moving more than one time per year (e.g. Curtis and Warren, 2016). Some work shows one move per year is linked with poorer child wellbeing (e.g. Coley et al. 2013), but often, negative outcomes for children are only present when moves are frequent (Mollborn et al 2018; Ziol-Guest and McKenna 2014).

In this study we examine a broad array of mobility related measures: whether a mother moved at least once in the last year, whether she moved more than one time per year on average, whether she is named on the lease/mortgage, and whether the move was for a “positive” reason (to establish an independent home, to move to a new neighborhood, to move to a better home, to own a home, or for a new job) as a move that improves a child’s housing quality or neighborhood is likely to improve child health and wellbeing (e.g., Leventhal and Newman 2010).

Second, we study two measures of housing instability: homelessness and eviction/foreclosure. Prior research suggests that homelessness and eviction are linked with poorer outcomes including: worse health (e.g. Burgard et al 2012), job loss (Desmond and Gershenson 2016), and behavior problems in children (LaBella et al 2017). 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, especially among low-income households, is housing affordability (JCHS 2017; Phinney et al. 2007). Thus, third, we study housing affordability, examining whether the EITC reduces the share of mothers who are cost burdened (paying 30% or more of earnings on rent/mortgage) or are severely cost burdened (pay 50% or more of earnings on rent/mortgage). The consequences of high housing costs reach beyond instability, affecting household expenditures on non-housing items and neighborhood choice (Bratt 2002; JCHS 2017), which in turn can affect children.

Fourth, we examine several measures of living arrangements, or household instability (Desmond and Perkins 2016) – changes in the composition of the household – adults (relatives and non-relatives) moving in or out of the household. Although less often studied in the context of housing, many studies show that the composition of the household, and household change are

linked with the wellbeing of individuals in the household (e.g. Mollborn et al. 2011; Osborne et al. 2012), as entry and exit of individuals can affect resources in the house.

Moving in with others – or doubling up¹ – is a form of household instability (or housing instability if accompanied by a move; e.g. King 2016) that has been linked with poorer educational outcomes (Low et al. 2016). Doubling up is a common precursor to homelessness and is often precipitated by a crisis that affects housing (e.g. Skobba and Goetz 2015; Wright et al. 1998). Additionally, about 65% of the children identified as homeless by school districts are living in doubled-up households (National Center for Homeless Education 2011). However, doubling up may also represent a form of social support or preference (e.g. Edin and Lein 1997; Stack 1975), as families that can move in with others may avoid more extreme forms of housing instability (like homelessness) and may save significant amounts of money on rent (Pilkauskas et al. 2014).

Doubling up may affect the size of the household. Thus, we also examine the total number of relatives in the household and the total number of non-relatives. We also study links with one particular type of doubled up household – three-generation households, where at least one grandparent, parent and child coreside (also known as multigenerational households). We examine these households separately because they are particularly common in early childhood (Pilkauskas and Martinson 2014), and among low-income and single mother households (Pilkauskas 2012). Additionally, prior research has linked three-generation coresidence with positive and negative outcomes for children (e.g. DeLeire and Kalil 2002; Pilkauskas 2014). Last, we examine household crowding, which is closely related to household size, and is sometimes considered a measure of housing quality. Research has found that household

¹ Note, we use the term doubling up throughout the manuscript but this term is interchangeable with moving in with others or living in a shared household.

crowding is associated with poorer outcomes for children (e.g., Evans et al. 1998) and lower graduation rates (Lopoo and London 2016).

Why Might the EITC Affect Housing Outcomes and Living Arrangements?

There are three main mechanisms through which the EITC might affect housing and living arrangements. First, the EITC benefit itself increases disposable income to spend on housing. Second, through its labor supply incentives, the EITC may lead to increases in earnings thus improving housing outcomes. Because households typically claim the EITC for multiple years, expansions to the EITC could lead to an increase in permanent family income, which in turn affects families' ability to afford housing. Finally, because the EITC is distributed as a lump sum around tax time (a form of forced savings), 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). Together, the EITC increases income and earnings that may be used on housing. The increased income leads to several hypotheses related to residential mobility, housing instability, affordability and household instability:

Hypothesis 1, residential mobility: The EITC will reduce residential instability (frequent moves), increase residential stability (being named on a lease) and, conditional on moving, increase residential mobility (a move for a good reason).

We hypothesize that the increased income resulting from the EITC will reduce residential instability as measured by frequent moves (mothers will have income to pay rent/mortgage reducing need to move), but increase stability as measured by being named on a lease or mortgage as income will provide mothers with the ability to pay their rent or mortgage.

However, if a mother does move, we hypothesize that the move will be welfare improving (to a better home or neighborhood).

Hypothesis 2, housing instability: The EITC will reduce homelessness and eviction/foreclosures.

The income gained from EITC expansions should unambiguously lead to lower rates of homelessness and eviction/foreclosure.

Hypothesis 3, housing affordability: The EITC will reduce the share of mothers who are cost burdened.

The increased income from the EITC should reduce the share of mothers who report paying 30% (or 50%) of their earnings on rent/mortgage. However, it is possible that if mothers move to more expensive housing (say in a better neighborhood), then the cost burden may be unchanged, or even worsen.

Last, hypothesis 4 addresses shared living arrangements/household instability.

Hypothesis 4 rests on the notion that individuals in the US generally have a preference for independent living (Engelhardt et al. 2005; Carlson et al. 2012) and would prefer to establish their own homes rather than live with others:

Hypothesis 4, household instability/living arrangements: Increased income from the EITC will reduce doubling up, reduce household size, other shared living arrangements and, thus, reduce crowding.

Although on average we expect mothers to have a preference to live independently, it is also possible that the increased income that comes with the EITC might increase doubling up among single mothers if she must support other economically disadvantaged friends and family (low-income mothers are typically embedded in homophilous networks; Smith et al. 2014).

Why Might the Effect of Income on Housing Instability be Different for Children Under Six?

We examine heterogeneity in the link between the EITC and housing/living arrangements

by whether the youngest child in the household is under age six. We do this for several reasons. First, prior research suggests that household instability (changes in living arrangements) may be more widespread among families with young children (Desmond and Perkins 2016) and housing instability is also more common among families with younger children (JCHS 2017). Second, early childhood is an especially important time for child development (Phillips and Shonkoff 2000), when instability may have especially detrimental impacts (Mollborn et al. 2018). Similarly, a long line of research has demonstrated that early childhood poverty can have particularly negative consequences (e.g. Hair et al. 2015) and that income boosts during this developmental time period can have long-lasting effects on earnings and employment (e.g. Duncan and Magnuson 2013). Last, the EITC itself may be more likely to impact mothers with young children as prior work suggests labor force participation effects are stronger among mothers with young kids (Meyer and Rosenbaum 2001; Michelmore and Pilkauskas 2018) and these mothers may have higher rates of EITC-eligibility (they are younger and may have lower earnings) than mothers with older children. This leads to our final hypothesis:

Hypothesis 5: The EITC will more strongly affect the housing and living arrangements of households with children under six than households with children over six.

By understanding whether the EITC improves housing outcomes for young children, we can better consider how expansions to tax credits might target this especially vulnerable group.

Prior Research

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-Meehan et al. 2015), no quantitative research has examined the links between the EITC,

housing and living arrangements.² Related research 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 et al. 2016). Research looking at administrative records of the receipt of child support found that household moves were much lower among families receiving regular support (Curtis and Warren 2016). With regard to living arrangements, studies of the effects of the EITC on marriage generally find small, negative effects on marriage (Herbst 2011; Michelmore 2018), but these studies have overlooked other living arrangements. Related research studied the effects of TANF and found mixed results on living arrangements (Bitler et al. 2006). In contrast, work on income in the form of pensions in the U.S. has generally found that they allow the elderly to live independently (e.g. Engelhardt et al. 2005).

There is also an extensive literature examining the effect of housing support policies (public housing, section 8 housing vouchers) on housing stability and other outcomes. Although functionally different from the EITC (in-kind, different eligibility), both public housing and housing vouchers reduce housing costs, increasing household income to spend on other items (e.g. Mills et al. 2006; Jacob and Ludwig 2012). In general, vouchers have been linked with reduced homelessness (Gubits et al. 2015) and crowding (Carlson et al. 2012), with mixed evidence on housing quality and neighborhoods (see Ellen 2017 for a review). One study found that voucher receipt was linked with fewer adults living in the household (Carlson et al. 2012). Related evidence from a randomized housing mobility program (Moving to Opportunity [MTO]) found moving to higher income neighborhoods improved mental and physical health and subjective wellbeing (e.g. Katz et al. 2001; Kling et al. 2007; Clampet-Lundquist and Massey

² One study modeled how inclusion of the EITC in income reduces housing cost burdens; Stegman et al. 2004

2008) and mixed evidence for child wellbeing (e.g. Ludwig et al. 2013). Research studying long-term gains of the MTO shows positive effects on economic and educational gains (and higher marriage rates) for children who moved to a higher income neighborhood when they were young (Chetty et al. 2016). Last, research has found that living in a housing project is associated with less crowding and improved school outcomes (Currie and Yelowitz 2000) but also no effects on children (Jacob 2004). In sum, the literature generally suggests that subsidized housing is linked with improved housing and individual outcomes, but there are some exceptions.

Although no research has examined the effect of the EITC on housing outcomes, many studies examine the effect of the EITC on related outcomes. Research shows that the EITC has a positive effect on labor supply among single mothers (e.g., Meyer and Rosenbaum 2001), increases earnings (Dahl et al. 2009), lifts families out of poverty (Hoynes and Patel 2017), increases household savings (Jones and Micheltore 2018), reduces child neglect (Berger et al. 2017) and improves children's education outcomes (Bastian and Micheltore 2018; Dahl and Lochner 2012) Together, this literature suggests that the EITC reduces economic uncertainty and reduces poverty, which in turn may affect housing/household wellbeing.

DATA

Data

Data for our main analysis come from the Current Population Survey March Supplement (CPS ASEC). The CPS is a nationally representative household survey conducted annually in March, gathering household income and employment information based on the prior calendar year. Each year of the survey collects data from approximately 60,000 households. We utilize the surveys from 1990 through 2016, reflecting the tax years 1989 to 2015. This time period allows us to capture the effect of the numerous federal expansions to the EITC in the early 1990s, and

the introduction of many of the state EITCs, which largely occurred after federal welfare reform in 1996.

We limit our sample to single mothers who are identified as the respondent and who have at least one child under the age of 19 residing in the household (n=137,595). Although married families and single adults are eligible for the EITC, we focus on single mothers in our main analysis since they represent the majority of EITC recipients and federal dollars spent (Tax Policy Center 2006).³ Following prior research (e.g., Hoynes and Patel 2017), we further limit the sample to women between the ages of 19 and 45 who have less than a college degree (n=99,409). College-educated single mothers have far lower rates of EITC-eligibility compared to women with less education, so they are less affected by the EITC. We also exclude women living in public housing, as public housing often places restrictions on who may coreside.⁴ Our final analytic sample includes 85,089 single mothers.

Living arrangements in the CPS are determined using a household roster with respect to the respondent. To accurately ascertain relationships in the household we must restrict our sample to respondents. However, the owner/renter/householder is typically selected as the respondent, likely rendering this sample more advantaged relative to subfamilies that are excluded.⁵ To address limitations in the CPS, we supplement our main analysis with two additional data sources.⁶ First, we use the 2000-2016 American Community Survey (ACS) and

³ Prior research has found that the EITC has a small effect on discouraging marriage (Dickert-Conlin and Houser 2002; Herbst 2011; Michelmore 2018). Thus, 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.

⁴ We include women who receive housing vouchers as they do not face the same restrictions as women in public housing. We find no evidence that the EITC affects the likelihood of living in public housing or having a housing voucher (results available upon request).

⁵ About 75% of single mothers who meet all other sample criteria are respondents in the CPS.

⁶ We also run analyses in the Survey of Income and Program Participation (SIPP; see Appendix Table 8) but do not include them here as the SIPP has limited housing measures and also has a preference for renter/owner of note.

the 1990 decennial Census (as a comparison year).⁷ Although the ACS uses a household roster that also requires that we restrict to the respondent to get accurate relationships, unlike the CPS, there is no preference for the renter/owner of note; any adult in the household can fill out the ACS. Thus, respondents are more likely to include both householders and subfamilies. Further, the ACS allows us to investigate how the EITC affects household crowding and cost burden. After making the same sample restrictions as the CPS (except excluding public housing recipients as this information is not available) our analytic sample includes 718,384 single mothers.

Second, to relax the assumption that the samples do not change as a function of the EITC generosity, we use the Fragile Families and Child Wellbeing Studies (FFCWS), a longitudinal birth cohort study covering tax years 1998-2016.⁸ Mothers were interviewed at the birth of the child, at age 1, 3, 5, 9 and 15 years old. The FFWCS oversampled nonmarital births, making it ideal for studying single mothers. Since the FFCWS follows the same individuals over time it follows the same respondent (regardless of who owns/rents the home) and we conduct an individual fixed effects analysis, where we can observe changes in our outcomes of interest as a function of changing EITC generosity that a single mother is exposed to over time due to policy changes. After sample restrictions, the analytic sample includes 9,930 person-observations.

Measures

Residential Mobility. In the CPS and the ACS, we can assess whether a family “moved in the last year” but not the number of moves that occurred. In the FFCWS, we identify mothers

⁷ Additional information on the ACS/census is in Appendix 1.

⁸ Additional details on the data/method, 15 sample states, sample restrictions, balance and migration tests are in Appendix 1. The FFCWS has been used in previous research to examine the effect of EITC expansions on maltreatment (Berger et al. 2016).

who “moved more than once per year” when a mother moves more than once in at least one of the years between survey waves (but possibly in more than one survey wave).⁹ In the FFCWS, we also examine whether mothers are named on the lease, an indicator that the mother is residing in her own home or apartment rather than someone else’s home.¹⁰ Among individuals who move, the CPS asks the main reason why the individual moved since the last year. Mothers are coded as having made a “positive move” if she reports any of the following primary reasons for the move: to establish own household, to own a home (not rent), to move to a new or better house/apartment, to live in a better neighborhood or for a new job.¹¹

Housing Instability. We examine two indicators of housing instability: whether the mother experienced an eviction/foreclosure, and whether the mother experienced homelessness. In the CPS, only individuals who moved since the last year are asked the primary reason why they moved. We consider mothers as “evicted or foreclosed” if they reported those as the primary reason for their move. In the FFCWS, mothers are asked if they have experienced eviction or homelessness in the last year; we create binary indicators for each.

Housing Affordability. In the ACS, we assess cost burden, measured as whether the mother’s housing costs exceed 30% of her earnings, or extremely cost burdened, measured as whether the mother’s housing costs exceed 50% of her earnings.

Living Arrangements/Household Instability. We examine three forms of doubling up: overall, three-generation, and doubling up that excludes three-generation households. Doubling up is coded as one if a grandparent, parent/in-law, sibling, aunt/uncle, non-related adult, or

⁹ The FFCWS asks total number of moves between survey waves, thus, some mothers may move five times in one year and not at all in others, may only move more than once/year in one year, or may regularly move more than once per year. In an extension we examined average number of moves between survey waves and found similar results.

¹⁰ This question was not asked in the year 1 survey.

¹¹ This question is only asked from 1997 onward. Respondents can report only one reason for the move, thus we interpret these as the primary or main reason for the move and focus on the housing instability/household improving reasons. In supplemental analyses (available upon request) we examined the impact of the EITC on all reasons for moving (such as other family reasons) but present the finding for reasons that are unambiguously positive outcomes.

niece/nephew over the age of 18 is living in the household. Following previous research (Mykyta and Macartney 2012; Pilkauskas et al. 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 cohabiting partner may be a form of doubling up, the underlying motivation for moving in with a partner (or moving out) is likely quite different than living with other relatives and non-relatives.¹² Three-generation households include the single mother, her child(ren), and at least one of the child's grandparents.¹³ Doubling up that excludes three-generation households identifies mothers living with any other relatives or non-relatives (excluding cohabiting partners).

We also examine changes in the total number of people residing in the household, including relatives and non-relatives of any age range, the total number of relatives residing in the household, which includes all individuals related to the householder by blood or marriage, and the total number of non-relatives in the household. In the ACS, household crowding is defined as more than one person per room (excluding bathrooms).

Earned Income Tax Credit. Our main independent variable of interest is a simulated measure of average EITC generosity at the state-year-family size level. This simulated measure captures policy variation in the EITC at the federal and state level over time, while eliminating

¹² Prior to the 1995 CPS survey, cohabiting partners were not explicitly identified in the household roster, but instead were included in the "partner/roommate" category. We consider a householder cohabiting (and therefore not doubled up) in the years prior to 1995 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. Thus, there is some measurement error in our identification of a doubled-up household versus a cohabiting partner household prior to 1995. This could bias results in either direction; we may mis-classify opposite sex roommates as cohabiting partners, we may also mis-classify women residing in doubled up households who are actually cohabiting with either same-sex partners, or partners that are much older or younger than themselves.

¹³ Three-generation households are a subset of doubled up households. These households are sometimes referred to as multigenerational households. In the ACS and the CPS we can only identify maternal grandparents, but in FFCWS we can identify both maternal and paternal three-generation households.

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 include: respondent's education (less than high school, high school, or some college), age, and race/ethnicity (coded as non-Hispanic Black, non-Hispanic White, Hispanic and other non-Hispanic race/ethnicity). We also include state fixed effects, survey year fixed effects, and number of child fixed effects.¹⁴ Finally, 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.¹⁵ These controls are included to address concerns that implementation and expansion of state EITCs may be correlated with the economic conditions in the state, which may, in turn, affect housing outcomes. To further address concerns that state EITC implementation and expansions may not be independent of other state factors, we also include state-specific pre-implementation time trends.

EMPIRICAL STRATEGY

To investigate the relationship between EITC generosity and housing, we use a parameterized difference-in-differences approach, which is commonly used in evaluating multiple policy changes over a period of time (e.g., Currie and Gruber 1996; Hoynes and Patel

¹⁴ In the FFCWS, where we include individual fixed effects we do not include state or child fixed effects.

¹⁵ 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://wrds.urban.org/wrd/Query/query.cfm>

2017). This approach 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 and living arrangements when the average EITC benefit becomes more generous.

To construct the simulated EITC, we take a nationally-representative sample of single mothers from the 1996 Survey of Income and Program Participation (SIPP)¹⁶ and inflate (deflate) their earnings using the Consumer Price Index (CPI) in each year between 1989 and 2015. 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 of single mothers. We then calculate federal taxes for this simulated sample of single mothers for each year between 1989 and 2015 using NBER's TAXSIM. Next, we determine state EITC benefits by running the national sample of single mothers through each state's EITC laws in each year between 1989 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, for instance, states with EITCs tend to have higher populations of EITC-eligible families, we would find larger average 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,

¹⁶ Using the SIPP to generate a nationally-representative sample of single mothers that is independent of the sample used in our analysis reduces concerns that our sample is not representative of the population of single mothers. We conducted the same analyses using a sample of single mothers in the CPS and results (available upon request) are virtually identical.

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 Figure 1, which shows average federal and state EITC benefits by state and number of children residing in the household over time.

For a one-child household (Figure 1, Panel A), 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 is about \$1100 (all numbers in 2011 real terms). Two-child households typically receive larger EITC benefits; the average two-child EITC increased from \$625 in 1990 to more than \$2200 in 2015 (Figure 1, Panel B). 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 (Figure 1 Panel C).

We match this information to our sample of single mothers in the CPS (ACS and FFCWS) by year, state, and number of children residing in the household. For a given individual in our sample, 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 CPS, a \$1,000 increase in the simulated benefit corresponds to a \$794 increase in own EITC benefits among single mothers, which is consistent with previous research that estimates about an 80% take-up rate of the EITC (Currie 2004).

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 datasets using a one-year lag.¹⁷ We then estimate the following reduced form model:

$$(1) Y_{istc} = \beta_0 + \beta_1 EITC_{stc} + \beta_2 X_{istc} + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \theta_c + \varepsilon_i,$$

Where Y_{istc} represents the housing and living arrangement outcomes of interest for individual i living in state s in year t with number of children in the household c . $EITC_{stc}$ is the average federal and state EITC for a single mother living in state s in year t with number of children c and reflects federal and state policy changes to the EITC between 1989 and 2015. Demographic characteristics, measured at the individual level, are represented by X_{istc} , and state-year level controls, including state-specific pre-implementation time trends, are represented by α_{st} .¹⁸ Additionally, we include state, year, and number of child fixed effects: δ_s , γ_t , and θ_c , respectively. All of the results we discuss below are robust to a Bonferroni correction for multiple hypotheses testing, unless otherwise noted.

With these controls in the model, we interpret β_1 as the effect of a \$1,000 increase in EITC generosity at the state-year-family size level on our measures of housing instability and living arrangements. Standard errors are clustered at the state level. Results from these analyses provide plausibly causal estimates of how increasing EITC generosity affects housing instability and the living arrangements of single mothers. To examine differences based on the age of the youngest child residing in the household, we estimate equation (1) separately for single mothers whose youngest child is under the age of six and single mothers whose youngest child is six or older. We follow the same analytic approach in the ACS analyses. For the FFCWS, we follow a

¹⁷ We also test a two-year lag specification and findings were similar.

¹⁸ We also ran models with state specific linear time trends. Results are presented in Appendix Table 2 and are largely similar to those with state specific pre-implementation time trends.

similar strategy but include family or individual-level fixed effects (explained further in Appendix 1).

RESULTS

Descriptive Statistics

Table 1 describes the three samples we use: the CPS, ACS, and FFCWS. Demographic characteristics are quite similar between the samples of women in the CPS and the ACS, whereas mothers in the FFCWS are quite different as it is an urban sample of mothers with younger children (0-15). Mothers in the FFCWS are younger (30 vs. 34), have less education (44% have no high school degree compared with 20% in the CPS and 16% in the ACS), and are much less likely to be white (14% vs. about 50% in the CPS/ACS). Mothers in all three samples have approximately two children. The average simulated EITC in our sample is \$1,550 – \$1,870. In the ACS and the FFCWS, about two-thirds of single mothers are eligible for the EITC, compared to about 60% in the CPS.

[Table 1 about here]

Table 2 provides descriptive statistics on the outcomes of interest. In all three data sources, about two-thirds of single mothers are working, and the average pre-tax earnings are approximately \$20,000 (2011\$). Employment and earnings values are slightly lower among single mothers in the FFCWS, likely due to differences in sample composition (mothers are younger and urban). Moving is fairly common among mothers in the CPS and the ACS: About one-quarter of single mothers report having moved in the last year. Frequent moves, however, are less common—only 6% of women in the FFCWS report moving more than once in a year between survey waves. Among those who move, about half of single mothers move for a

welfare-improving reason. Eviction or foreclosure is rare (2% in the CPS and 3% in FFCWS), and 2% of mothers reported being homeless in the last year.¹⁹

Despite low levels of extreme housing instability, according to the ACS, a very large share of single mothers report significant cost burdens: nearly three-quarters of single mothers (71%) spend at least 30% of their earnings on housing costs, and approximately half (51%) spend at least 50% of their earnings on housing costs.

[Table 2 about here]

Fifteen-percent (12%) of single mothers live in a doubled-up household according to the CPS (ACS), and rates of doubling up are about twice as high among single mothers in the FFCWS (30%), likely due to the age and race/ethnic differences across samples. Only about a third of those doubled-up are living in three-generation households in the CPS and the ACS, whereas three-generation households account for two-thirds of all doubled up situations among single mothers in the FFCWS. The average number of people residing in the household (including the single mother) is almost 3.5 people in the CPS and the ACS, and about 4.5 people in the FFCWS. The vast majority of household members are relatives, according to all three data sources. Finally, about 1 in 10 single mothers experience household crowding in the ACS.

In Appendix Table 3, we provide descriptive statistics on differences in outcomes and sample characteristics among mothers with children under six compared to those with children over six in the CPS and ACS. In general, mothers with older children are older, somewhat more likely to be white, and to have some college compared to mothers with children under six. Mothers with older children are also more likely to be working and have higher earnings than mothers with young children. As compared to mothers with children under six, mothers with

¹⁹ It is likely these are underestimates as mothers experiencing homelessness/eviction may leave the study sample and are likely harder to track.

children over six are much less likely to have moved in the last year, less likely to be cost burdened, somewhat less likely to be doubled up and less likely to experience household crowding. EITC eligibility is similar across groups; however, mothers with younger children receive slightly larger credit amounts.

Does the EITC Affect Housing and Living Arrangements?

The EITC, Employment and Earnings. Before presenting results for our housing outcomes of interest, we first replicate previous findings that the EITC increases the labor supply of single mothers (Table 3). In all but the FFCWS, we find that expansions to the EITC in the 1990s and 2000s increased the labor supply and annual earnings of single mothers. A \$1000 increase in the average EITC increases single mother's labor supply by 10 percentage points (pp) and earnings by nearly \$3000 in the CPS and 5pp (and \$2000 in earnings) in the ACS. Labor supply results are insignificant (2pp), though positively signed, in the FFCWS, and earnings gains are about \$1,400.²⁰ The differences across datasets likely arise due to different sampling periods (FFCWS and ACS miss some federal expansions), and types of samples (FFCWS lacks complete coverage of all states, is an urban sample and is demographically quite different from the ACS/CPS). Still, our results are similar to previous estimates (Meyer and Rosenbaum 2001; Bastian and Michelmore 2018) and suggest that the EITC leads to substantial increases in labor supply and earnings among single mothers.

[Table 3 about here]

The EITC, Mobility, Instability and Affordability. Table 4 presents results from our reduced-form analysis of the relationship between average EITC benefits and the residential mobility, housing instability, and housing affordability outcomes. We present results from the

²⁰ This finding is marginally significant after Bonferroni correction for multiple hypothesis testing.

CPS and the ACS and the FFCWS, though not all outcomes are available in each data source. The CPS and the ACS both provide information on whether a respondent moved in the last twelve months, and we find contradicting estimates of how the EITC affects the likelihood of moving in the two data sources. In the CPS, we find that a \$1,000 increase in the average EITC leads to a 3pp increase in the likelihood of moving in the last year. We also find that among those who do move, they are approximately 3pp more likely to report that the move was for a positive reason—to own a home, find a better neighborhood/apartment, or for a new job – although the finding is only marginally significant.²¹ Thus, although mothers in the CPS are more likely to move, they are also marginally more likely to say that they moved for a welfare-improving reason.

[Table 4 about here]

However, in the ACS, we find the opposite result. A \$1,000 increase in the average EITC is associated with a 3pp *decrease* in the likelihood of moving in the last year. We cannot be certain of the source of these discrepancies. Although the two samples look similar in terms of economic wellbeing, the CPS has a preference for the owner/renter to be the respondent (about 75% of all single mothers). If these respondents are more economically stable (and say have a longer rental history which may make it easier to find new or better housing), then they may be more likely to move for a welfare improving reason. The ACS, on the other hand, does not make the same restriction; therefore it may have a more representative sample of all single mothers than the CPS.

The FFCWS allows us to examine the link between expansions to the EITC and moves; identifying both mothers who are named on the lease and those who are not. Additionally, rather than examining whether a move occurred, we can analyze whether a mother moved more than

²¹ This finding is no longer significant after Bonferroni correction.

once per year, a marker of instability. Results from the FFCWS are consistent with the ACS, and suggest that expansions to the EITC lead to less frequent moves, as women in the FFCWS are 2.4pp less likely to move more than once per year. Women exposed to larger EITC benefits are also 9.4pp more likely to be named on the lease, an indication that they reside in their own home rather than someone else's. Thus, with regard to hypothesis 1, we find support that frequent moves are reduced (and mixed support for any moves), and that moves that do occur may be for welfare improving reasons.

Although we hypothesized that the EITC would decrease foreclosure or eviction (hypothesis 2), we find no evidence to support this hypothesis. We find no significant relationship between EITC generosity and any of our eviction/foreclosure and homelessness measures in either the CPS or the FFCWS. This finding is in keeping with prior research that indicates that the EITC does little to help the extreme poor (below 50% of poverty; Hoynes and Patel 2017). Additionally if mothers who are evicted or homeless are more likely to be unemployed, then the EITC, which requires employment, will do little to assist them.

Finally, Table 4 examines housing affordability. We find support for hypothesis 3, which suggests that the EITC reduces mother's housing cost burden. Following a \$1,000 increase in the average EITC, single mothers are 3.5pp less likely to be paying more than 30% of their earnings towards housing costs, and 4.5pp less likely to be paying more than 50% of their earnings towards housing costs.

The EITC, Living Arrangements/Household Instability and Crowding. In Table 5, we examine the effects of the EITC on the living arrangements of single mothers. In all three data sources, we find support for hypothesis 4, that the EITC reduces the likelihood of doubling up. A

\$1,000 increase in the average EITC reduces doubling up by 1.5pp²² and 1.8pp in the ACS and CPS, respectively. In the FFCWS, the estimate is much larger, likely because rates of doubling up are nearly double that of the ACS/CPS; a \$1000 expansion of the EITC reduces doubling up by 10pp.²³ In the CPS, most or all of this reduction is driven by a reduction in the likelihood of living in a three-generation household (2pp). In comparison in the ACS and FFCWS, about 1/3 or half of the reduction in doubling up is driven by a reduction in three-generation households.²⁴ In both of these datasets, doubling up with other relatives/non-relatives is also reduced. In the FFCWS we can distinguish doubling up in someone else's home from one's own home and we find that the EITC reduced doubling up in someone else's home by 6.5pp, about half of the overall reduction.

We also examine household instability/living arrangements by studying the number of people who are in the household. Although not statistically significant in the CPS, in both the CPS/ACS we find that an increase in the EITC reduces the total number of people in the household (by 0.2 and 0.4 people respectively).²⁵ In both these datasets the reduction in people seems to be largely driven by relatives moving out of the household with little or no change in the number of non-relatives. The results in the FFCWS, however, are very different. We find an increase in the total number of people and relatives in the household following an increase in the EITC, despite a decline in doubling up and a decrease in the number of non-relatives in the household. To examine this seemingly contradictory finding we ran a few additional analyses in the FFCWS. We generated variables to restrict to the number of adults in the household. When

²² Significant at $p < .05$ after Bonferroni correction.

²³ Doubling up is especially common in early childhood (Pilkauskas et al. 2014), among minority mothers and when children are young (Pilkauskas 2014). The birth cohort nature of this study means many observations in the FFCWS come from early childhood.

²⁴ ACS estimate is significant at $p < .05$ after Bonferroni correction.

²⁵ ACS estimate is significant at $p < .05$ after Bonferroni correction.

the total number of people in the household is restricted to adults, we find that increases in the EITC are associated with a significant decline of -0.25 adults. Likewise, when we focus on adult relatives, we find a significant reduction of -0.21 relatives. Last, we re-ran the model controlling for the number of children in the household.²⁶ When we do this we find a significant reduction of -0.36 people in the household, suggesting that in fact, there is a reduction in household size in terms of adults, but perhaps an increase in the number of children in the household. Future research is needed to determine if the EITC increases fertility, or if this is a function of the cohort sample.

[Table 5 about here]

Finally, in the ACS, we find that the EITC reduces household crowding by 2 pp. This again provides support for hypothesis 4, that the EITC should reduce incidence of doubling up and household crowding.

Does the Effect of the EITC on Housing and Living Arrangements vary by Child's Age?

Next in Table 6, we examine whether the results we presented thus far are different for households with young children (youngest child is under age six) compared to those with older children (youngest child is six or older) using the CPS and ACS.²⁷ Employment and earnings effects are larger among mothers with young children compared to mothers with older children. In the ACS, the employment response of mothers with young children is approximately twice that of mothers with older children (5.7pp compared to 3pp, respectively). Employment effects are also larger among mothers with young children in the CPS, though they are not statistically significantly larger than mothers with older children. We do, however, find that earnings gains

²⁶ We do not do this in our main analysis as it restricts estimation to mothers who experience a change in number of children, which may be endogenous to changes in the EITC.

²⁷ The birth cohort nature of the FFCWS precludes us from conducting this analysis in those data.

are significantly larger among mothers with young children than mothers with older children in the CPS.

Although the direction of the effect is again inconsistent between the CPS and the ACS, we find larger effects for mothers with young children than those with older children with regard to moving in the last year (although the difference is not significant in the CPS). Declines in cost burden are also larger among mothers with young children than mothers with older children, but differences by age are only significant for extreme cost burdens. Finally, with regard to living arrangements and household instability, in the CPS we find reductions in doubling up and household size are significantly larger among mothers with young children than mothers with older children. In the ACS, the point estimates for doubling up and household size are not significantly different for households with young children compared to households with older children. Last, we find that the crowding reduction is larger (but not significantly different) among mothers with young children as compared to mothers with older children. Together, we believe this provides mixed support for hypothesis 5, that the effects of the EITC will be stronger for younger children.

Robustness Checks

We conduct a number of sensitivity analyses to test the robustness of our findings in the ACS and the CPS. First, in Appendix Table 4, we ran a placebo test on the sample of college-educated single mothers in the CPS and ACS. As anticipated, we find little evidence to suggest the EITC affects the housing and living arrangements of college educated mothers. Second, to address the concern that state EITC variation may not be exogenous to housing outcomes, we ran

an analysis portioning our treatment variable into its state and federal components.²⁸ Results (in Appendix Table 5) indicate that the findings for moves and living arrangements are largely driven by the federal expansions to the EITC. Third, because homeowners may be affected differently than renters, in Appendix Table 6, we ran the analyses comparing homeowners to renters (and to subsidized renters in the CPS). We find that renters (with or without subsidies), rather than homeowners, drive most of our results.²⁹

Fourth, following earlier research, we ran a difference-in-differences model analyzing two federal expansions to the EITC (that are incorporated in the reduced form model): the early 1990s expansion that expanded benefits for two-child households and the federal expansion for three or more child households as part of the American Recovery and Reinvestment Act (ARRA) of 2009. Appendix 1 describes the method in more detail and Appendix Table 7 shows the results. Although we find few statistically significant estimates on the other outcomes of interest (point estimates are similar to those in Tables 4 and 5, but less precise), we find some marginal evidence that single mothers with two or more children are more likely to move and less likely to double up following the federal EITC expansions in the early 1990s relative to mothers with exactly one child. For the ARRA expansion, we no significant effects in the CPS, although the point estimates are in the same direction as in the reduced form analyses. In the ACS, however, we find evidence that after the ARRA expansion, households with three or more children were less likely to move (1.5pp), less likely to be cost burdened (2.2pp), and less likely to be doubled up (1pp).

²⁸ We present analyses controlling for the both state and federal EITC but models run separately (not controlling for the other) yielded similar results.

²⁹ We found no significant relationship between EITC generosity and the likelihood of single mothers owning their own homes, so we do not believe that these results could be driven by compositional changes in the single mothers who own/rent their homes.

Last, we run a similar set of analyses in the Survey of Income and Program Participation (SIPP). Although the SIPP has a number of similar limitations as the CPS (preference for a household head, few housing and living arrangement measures, and only 4 year long panels), we use the panel nature of the data to test the robustness of our findings using individual fixed effects (see Appendix Table 8). We find a reduction in both doubling up (6pp) and living in a three-generation household (3pp) but no other significant associations (although point estimates on moving are all negative, suggesting fewer moves).

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. To better understand how policies might be designed to help these families, it is crucial to understand whether current policies, like the EITC, affect the housing and living arrangements of low-income families. This study is the first to examine whether the EITC, the largest cash transfer program for low-income families in the US, affects housing and living arrangements.

In keeping with prior research, we found that the EITC increased employment and income among single mothers (e.g., Meyer and Rosenbaum 2001). With regard to residential mobility, we found some support for hypothesis 1 that suggested that frequent moves (moving more than one time per year) decrease as a function of EITC generosity. However, evidence on how the EITC affects any moves in the last year was mixed. In the CPS, we found a \$1,000 expansion to the average EITC increases the likelihood that single mothers move but also some weak evidence that these moves were for welfare-improving reasons: to move to a better neighborhood, to establish one's own home, to purchase a home, or for a new job. In the ACS on

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the other hand, we found that increases in the EITC reduced the likelihood of moving in the prior year. In the FFCWS we also found mothers were less likely to move frequently and they were more likely to be named on the lease, but whether that was a result of a move (or taking over a lease) we cannot determine. Thus, it is difficult to determine whether the EITC affected mobility, but the findings suggest mothers are more stable. Future research that can better distinguish between residential instability and mobility is needed.

We hypothesized that this increased income would reduce homelessness and eviction/foreclosures. We found little evidence to support this hypothesis. There are several reasons why this might be the case. First, although average EITC transfers are relatively large, they may not be sufficient to offset extreme household shocks that lead to evictions. Second, although increasingly common (Desmond 2016), evictions and foreclosures are still relatively uncommon events, around 1-2% in the data used here (and likely under-observed in household based surveys). Thus, even if the EITC did reduce evictions, we might not find an effect with these data. Third, and perhaps most likely, in order to receive the EITC a mother must have earnings. Prior research has found that those with incomes at the bottom of the income distribution (below 50% of poverty) are least likely to be affected by the EITC (Hoynes and Patel 2017). If mothers who do not work are those who experience homelessness or eviction, then the EITC cannot effectively assist those households.

We found evidence to support hypothesis 3, that the EITC would reduce mothers' housing costs burdens. In keeping with other research (JCHS 2017), we find many mothers in our sample are cost burdened, and more than half experience severe housing cost burdens (pay more than 50% of earnings on housing). We find that both moderate and extreme housing cost burdens are reduced when the EITC is expanded. There may be heterogeneity in these findings

by local housing markets (i.e. the EITC may be more effective in lower-cost markets at reducing cost burdens). Data and methodological limitations precluded our ability to examine differences at the local housing market level, but future research should examine these differences.

We also found support for hypothesis 4; the EITC reduces doubling up, household size, other shared living arrangements and crowding. Across all three datasets we found that the EITC reduces doubling up and shared living arrangements more generally. This is in keeping with earlier studies of the elderly that found that individuals in the U.S. generally prefer to live independently (e.g. Engelhardt et al. 2005). Similarly, we observed a decline in the number of people in the household, driven largely by a decline in the number of relatives residing in the household. Lastly, in the ACS we also found evidence that crowding was reduced. This is important, as prior work has linked crowding with poorer educational outcomes for children (e.g. Lopoo and London 2016) and increased vulnerability to adverse experiences (Edin and Shaefer 2015).

Although in general, the findings here suggest that the EITC improves housing outcomes for mothers as they are less likely to move frequently, have reduced cost burdens, and experience less household crowding, the living arrangement results are less obvious. It is not clear whether reducing doubling up, or moving out of a three-generation household is a positive, negative or neutral outcome. That we find that mothers appear to be more likely to be named on the lease and are more likely to move out of someone else's home, suggests mothers are experiencing some form of increased stability, but more importantly they have a preference for independent living. Doubling up in someone else's household may be a stable arrangement, but studies suggest that individuals residing in someone else's home are at higher risk of losing housing if they are dependent on the goodwill of friends or family and may use up social capital (Skobba

and Goetz 2015; Wright et al. 1998). In the case of grandparents, one may be concerned that moving out of coresidence with a grandparent might be a negative outcome if the grandparent provides mothers with child care assistance or help with other expenses. It is important to note that there is little evidence to support the notion that three-generation coresidence is necessarily positive. Studies find significant heterogeneity with respect to children's wellbeing, finding no association (Augustine and Raley 2013), and some positive and some negative (e.g. Deleire and Kalil 2002; Mollborn et al 2011; Pilkauskas 2014). Similarly, studies of maternal employment show only short-term gains from three-generation coresidence (Hao and Brinton 1997) but also negative associations with parenting (Chase-Lansdale et al. 1994).

Although not all outcomes, or all differences were statistically significant, we found some support for hypothesis 5, the general pattern of results suggested that the effect of the EITC on housing and living arrangements was stronger for mothers with children under six (this was especially true in the CPS). More research is needed to verify these differences, especially in other areas of research, but these findings are suggestive that the EITC may help families during a critical developmental time period.

This study offers some important implications for income, tax, and housing policy. Our findings suggest that a \$1,000 increase in the EITC would reduce extreme housing cost burdens by about 10%, crowding by 22%, and doubling up by 12% in both the ACS and CPS and by about 33% in the FFCWS. However, a \$1000 increase in the current EITC would be quite large. If we consider a smaller expansion of say \$250, our estimates would predict doubling up to decrease by 3-8%, cost burdens by 2-3% and crowding to decline by about 6%. We also find that federal expansions affected housing instability and living arrangements more strongly than state EITCs, perhaps because state EITCs are generally much smaller than the federal EITC.

This study is not without limitations. Our analyses focus on single mothers, those who are most 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 claim all of the children that reside 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 claim any of the children residing in the household, this would result in measurement error, potentially biasing our estimates.

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. Although 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, again resulting in measurement error potentially biasing our estimates.

Another issue 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 (e.g., Micheltore 2018). The magnitude of our results is likely too large to be completely explained by marriage effects. Another possibility is that the EITC induces more

couples to cohabit (say out of a household with family and friends into a household with an unmarried partner). In an extension in the ACS, where identification of cohabiters is more consistent than in the CPS, we find no associations with cohabitation. This suggests that our reduction in doubling up cannot be fully explained by a rise in cohabitation, although future work that can more fully examine the impact of the EITC on cohabitation is needed.

Despite some limitations, the findings in this study suggest that the EITC and other income transfer policies might be an effective means for improving housing outcomes for low-income families. Although the evidence for residential mobility was mixed, the findings suggest that expansions to the EITC improve housing through reduced cost burdens, reduced frequent moves, increased likelihood of being named on the lease, reductions in household crowding and reduced doubling up in other people's households. By improving housing outcomes and increasing the stability in the living arrangements of children, the EITC may help reduce the intergenerational consequences of housing instability.

REFERENCES

- Augustine, J. M., & Raley, R. K. (2013). Multigenerational households and the school readiness of children born to unmarried mothers. *Journal of Family Issues*, 34, 431-459.
- Bastian, J. & Micheltore, K. (2018). The long-term impact of the Earned Income Tax Credit on children's education and employment outcomes. *Journal of Labor Economics* 36(4): 1127-1163.
- Berger, L. M., Font, S. A., Slack, K. S., & Waldfogel, J. (2017). Income and child maltreatment in unmarried families: evidence from the earned income tax credit. *Review of Economics of the Household*, 15, 4, 1345-1372.
- Bitler, M. P., Gelbach, J. B., & Hoynes, H. W. (2006). Welfare reform and children's living arrangements. *Journal of Human Resources*, 41,1, 1-27.
- Bratt, R. G. (2002). Housing and family well-being. *Housing Studies*, 17, 13–26.
- Burgard, S., Seefeldt, K. & Zelner, S. (2012). Housing instability and health: Findings from the Michigan recession and recovery study. *Social Science and Medicine*, 75, 2215-2224.
- Carlson, D., Haveman, R., Kaplan T, & Wolfe, B. (2012). Long-term effects of public low-income housing vouchers on neighborhood quality and household composition. *Journal of Housing Economics*, 21,2, 101-120
- 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>
- Chase-Lansdale, P. L., Brooks-Gunn, J., & Zamsky, E. S. (1994). Young African-American multigenerational families in poverty: Quality of mothering and grandmothering. *Child Development*, 65, 2, 373-393.
- Chetty R., Hendren N, & Katz L. (2016). The effects of exposure to better neighborhoods on children: New evidence from the Moving to Opportunity project. *American Economic Review*, 106, 4, 855-902.
- Clampet-Lundquist, S. & Massey, D.S. (2008). Neighborhood effects on economic self-sufficiency: A reconsideration of the Moving to Opportunity experiment.” *American Journal of Sociology*, 114, 1, 107–43.
- Coley, R. L., Leventhal, T., Lynch, A. D., & Kull, M. (2013). Relations between housing characteristics and the well-being of low-income children and adolescents. *Developmental Psychology*, 49, 1775.
- 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.
- Currie, J., & Yelowitz, A. (2000). Are public housing projects good for kids?. *Journal of public economics*, 75(1), 99-124.
- 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, *National Tax Journal*, 329-346.
- 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.
- DeLeire, T., & Kalil, A. (2002). Good things come in threes: Single-parent multigenerational family structure and adolescent adjustment. *Demography*, 39, 2, 393-413.
- Desmond, M. (2016). *Evicted: Poverty and profit in the American city*. New York: Crown
- Desmond, M. and Gershenson, C. (2016). Housing and employment insecurity among the working poor. *Social Problems*, 63, 46-67.
- Desmond, M., & Perkins, K. L. (2016). Housing and household instability. *Urban Affairs Review*, 52(3), 421-436.
- Dickert-Conlin, S., & Houser, S. (2002). EITC and marriage. *National Tax Journal*, 25—40.
- Duncan G.J., Magnuson K. (2013) The long reach of early childhood poverty. In: Yeung WJ., Yap M. (eds) *Economic stress, human capital, and families in Asia. Quality of life in Asia*. Springer, Dordrecht
- Edin, K., & Lein, L. (1997). *Making ends meet* (Vol. 8). New York: Russell Sage Foundation.
- Edin, K. J., & Shaefer, H. L. (2015). *\$2.00 a day: Living on almost nothing in America*. Houghton Mifflin Harcourt.
- Ellen, I.G. (2017) What do we know about housing choice vouchers? NYU Furman Center Working Paper.
https://furmancenter.org/files/HousingChoiceVouchers_WorkingPaper_IngridGouldEllen_14AUG2017.pdf
- 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, G.W., Lepore, S.J., Shejwal, B.R. & Palsane, M.N. (1998). Chronic residential crowding and children's well-being: an ecological perspective. *Child Development* 69, 6, 1514-1523.
- Evans, W., Sullivan, J., & Wallskog, M. (2016). The impact of homelessness prevention programs on homelessness. *Science*, 353, 6300.
- Gubits, Daniel, Marybeth Shinn, Michelle Wood, Stephen Bell, Samuel Dastrup, Claudia D. Solari, Scott R. Brown, Debi McInnis, Tom McCall, and Utsav Kattel. (2016). Family Options Study: 3-Year Impacts of Housing and Services Interventions for Homeless Families. Washington, DC: U.S. Department of Housing and Urban Development
- Hair, N. L., Hanson, J. L., Wolfe, B. L., & Pollak, S. D. (2015). Association of child poverty, brain development, and academic achievement. *JAMA Pediatrics*, 169(9), 822-829.
- Halpern-Meehin, 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.
- Hao, L., & Brinton, M. C. (1997). Productive activities and support systems of single mothers. *American Journal of Sociology*, 102, 5, 1305-1344.
- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312, 5782, 1900-1902.
- 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. (2017). Effective Policy for Reducing Poverty and Inequality? The Earned Income Tax Credit and the Distribution of Income. *Journal of Human Resources*, 1115-7494R1.
- Jacob, B. A. (2004). Public housing, housing vouchers, and student achievement: Evidence from public housing demolitions in Chicago. *American Economic Review*, 94(1), 233-258.
- Jacob, B.A. & Ludwig, J. (2012). The effects of housing assistance on labor supply: Evidence from a voucher lottery. *American Economic Review*, 102, 1, 272-304.
- Joint Center for Housing Studies Harvard. (2017). The state of the nations housing. http://www.jchs.harvard.edu/research/state_nations_housing
- Jones, L. & Michelmore, K. (2018). The impact of the Earned Income Tax Credit on household finances. *Journal of Policy Analysis and Management*.
- Katz, L.F., Kling, J.R. & Liebman, J.B. (2001). Moving to Opportunity in Boston: Early results of a randomized mobility experiment. *Quarterly Journal of Economics* 116, 2, 607–54.

- King, C. (2016). Food insecurity and housing instability in vulnerable families. *Review of Economics of the Household*, 1—19.
- Kling, J.R., Liebman, J. B. & Katz, L.F. (2007). Experimental analysis of neighborhood effects. *Econometrica* 75, 1, 83–119.
- Labella, M. H., Narayan, A. J., McCormick, C. M., Desjardins, C. D., & Masten, A. S. (2017). Risk and adversity, parenting quality, and children's social-emotional adjustment in families experiencing homelessness. *Child Development*.
- 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.
- Ludwig, J., Duncan, G.J., Genetian, L.A., Katz, LF, Kessler, R.C., Kling, J.R., & Sanbonmatsu, L. (2013). Long-term neighborhood effects on low-income families: Evidence from Moving to Opportunity. *American Economic Review*, 103, 3, 226–31.
- 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.
- Micheltore, K. (2018). The Earned Income Tax Credit and union formation: The impact of expected spouse earnings. *Review of Economics of the Household* 16(2): 377-406.
- Micheltore, K. & Pilkauskas, N.V. (2018) Tots or teens: Who benefits from refundable tax credits? Poverty Solutions Working Paper Available: <http://poverty.umich.edu/working-paper/tots-or-teens-who-benefits-from-refundable-tax-credits/>
- Mills, G., Gubits, D., Orr, L., Long, D., Feins, J., Kaul, B., Wood, M., Jones, A., Cloudburst Consulting Associates, & the QED group. (2006). *The effects of housing vouchers on welfare families*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- Mollborn, S., Fomby, P., & Dennis, J. A. (2011). Who matters for children’s early development? race/ethnicity and extended household structures in the United States. *Child Indicators Research*, 4(3), 389-411.
- Mollborn, S., Lawrence, E., & Root, E. D. (2018). Residential Mobility Across Early Childhood and Children’s Kindergarten Readiness. *Demography*, 1-26.

- 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 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>
- Osborne, C., Berger, L. M., & Magnuson, K. (2012). Family structure transitions and changes in maternal resources and well-being. *Demography*, 49, 1, 23-47.
- Phillips, D. A., & Shonkoff, J. P. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. National Academies Press.
- Phinney, R., Danziger, S., Pollak, H. & Seefeldt, K. (2007). Housing instability among current and former welfare recipients. *American Journal of Public Health*, 97, 832-837.
- Pilkaukas, N. V. (2012). Three-generation family households: Differences by family structure at birth. *Journal of Marriage and Family*, 74(5), 931-943.
- Pilkaukas, N. V. (2014). Living with a grandparent and parent in early childhood: Associations with school readiness and differences by demographic characteristics. *Developmental Psychology*, 50, 2587.
- Pilkaukas, N. V., Garfinkel, I., & McLanahan, S. S. (2014). The prevalence and economic value of doubling up. *Demography*, 51, 1667-1676.
- Pilkaukas, N. V., & Martinson, M. L. (2014). Three-generation family households in early childhood: Comparisons between the United States, the United Kingdom, and Australia. *Demographic Research*, 30, 1639.
- Sharkey, P., & Sampson, R. J. (2010). Destination effects: Residential mobility and trajectories of adolescent violence in a stratified metropolis. *Criminology*, 48(3), 639-681.
- Skobba, K., & Goetz, E. G. (2015). Doubling up and the erosion of social capital among very low income households. *International Journal of Housing Policy*, 15(2), 127-147.
- Smith, J. A., McPherson, M., & Smith-Lovin, L. (2014). Social distance in the United States: Sex, race, religion, age, and education homophily among confidants, 1985 to 2004. *American Sociological Review*, 79, 3, 432-456.
- Stack, C. B. (1975). *All our kin: Strategies for survival in a black community*. Basic Books.
- Stegman, M. A., Davis, W. R., & Quercia, R. (2004). The earned income tax credit as an instrument of housing policy. *Housing Policy Debate*, 15, 203-260

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.

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 descriptives, CPS, ACS and FFCWS

	CPS	ACS	FFCWS
<i>Maternal characteristics</i>			
Age	33.62 (6.82)	33.38 (6.76)	29.65 (7.34)
Number of children	1.78 (0.78)	1.84 (0.78)	2.02 (0.82)
<i>Race/ethnicity</i>			
Non-Hispanic white	0.51	0.50	0.14
Non-Hispanic black	0.23	0.27	0.57
Hispanic	0.20	0.19	0.26
Other race/ethnicity	0.05	0.04	0.03
<i>Education</i>			
Less than high school	0.20	0.16	0.44
High school diploma	0.40	0.47	0.30
Some college	0.41	0.37	0.26
<i>Earned Income Tax Credit (EITC)</i>			
Average simulated EITC (in \$1000s)	1.54 (0.59)	1.64 (0.61)	1.87 (0.51)
Eligible for the EITC	0.58	0.66	0.69
EITC credit (in \$1000s)	1.44 (1.67)	1.49 (1.67)	1.67 (1.75)
Number of Observations	85,089	718,384	9,946

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey (ACS) 2000-2016. Fragile Families and Child Well Being Study (FFCWS) 1998-2016. Sample is restricted to single mothers with less than a college degree and with at least one coresident child under the age of 19. CPS/ACS also restricted to mothers ages 19-45.

Note: All dollars in 2011\$. SD in parentheses.

Table 2. Sample means for employment, housing and living arrangement outcomes, CPS, ACS and FFCWS

	CPS	ACS	FFCWS
<i>Mother's earnings/employment</i>			
Working	0.67	0.69	0.61
Annual pre-tax earnings (in \$1,000s)	20.09 (25.53)	20.1 (22.75)	18.78 (21.31)
<i>Moving outcomes</i>			
Moved since last year ¹	0.24	0.20	
Moved more than once per year			0.06
Named on the lease			0.74
Positive move ²	0.11		
<i>Housing instability</i>			
Moved because of foreclosure ²	0.02		
Evicted in last year			0.03
Homeless in last year			0.02
<i>Housing affordability</i>			
Cost burden 30% of mother's earnings		0.71	
Cost burden 50% of mother's earnings		0.51	
<i>Living arrangements/household instability</i>			
Doubled up	0.15	0.12	0.30
Living in three-generation household	0.06	0.04	0.19
Doubled up (excluding three-generation households)	0.08	0.08	0.12
Doubled up in someone else's home ³			0.17
Number of people in the household	3.37 (1.28)	3.44 (1.32)	4.49 (1.73)
Number of relatives in the household ⁴	3.14 (1.21)	3.38 (1.28)	3.75 (1.42)
Number of non-relatives in the household ⁴	0.23 (0.51)	0.06 (.31)	0.12 (0.45)
<i>Household crowding</i>			
Crowding		0.10	
Number of Observations	85,089	718,384	9,946

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey (ACS) 2000-2016. Fragile Families and Child Well Being Study (FFCWS) 1998-2016. Sample is restricted to single mothers with less than a college degree and with at least one coresident child under the age of 19. CPS/ACS also restricted to mothers ages 19-45.

Note: All dollars in 2011\$. SD in parentheses.

¹ Not available in 1995 CPS

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

Table 3. Effect of the EITC on employment and earnings

	CPS	ACS	FFCWS
Worked last week	0.096*** (0.01)	0.054*** (0.005)	0.019 (0.015)
Annual earnings	2.945*** (0.52)	2.238*** (0.236)	1.396* (0.653)
Number of Observations	85,089	718,384	9928

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Fragile Families and Child Well Being Study (FFCWS) 1998-2016. Sample is restricted to single mothers with less than a college degree and with at least one coresident child under the age of 19. CPS/ACS also restricted to mothers ages 19-45. Single mothers residing in public housing are excluded from CPS/FFCWS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. CPS/ACS models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. FFCWS models include demographic and state contextual characteristics, year and individual fixed-effects. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; **p<.01; ***p<.001

Table 4. Effect of the EITC on residential mobility, housing instability, and housing affordability

	CPS	ACS	FFCWS
<i>Residential mobility</i>			
Moved since last year ¹	0.029** (0.009)	-0.031*** (0.005)	
Moved more than 1x/year			-0.024** (0.008)
Named on the lease ²			0.094*** (0.016)
Positive move ³	0.027+ (0.015)		
<i>Housing instability</i>			
Moved because of foreclosure/eviction ³	0.001 (0.007)		
Evicted in last year			-0.006 (0.006)
Homeless in last year			-0.006 (0.005)
<i>Housing affordability</i>			
Cost burden 30% mother's earnings		-0.034*** (0.006)	
Cost burden 50% mother's earnings		-0.045*** (0.005)	
Number of Observations	85,089	718,384	9928

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Fragile Families and Child Well Being Study (FFCWS) 1998-2016. Sample is restricted to single mothers with less than a college degree and with at least one coresident child under the age of 19. CPS/ACS also restricted to mothers ages 19-45. Single mothers residing in public housing are excluded from CPS/FFCWS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. CPS/ACS models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. FFCWS models include demographic and state contextual characteristics, year and individual fixed-effects. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; **p<.01; ***p<.001

¹ Not available in 1995 CPS.

² Information not asked in Year 1.

³ Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

Table 5. Effect of the EITC on living arrangements/household instability and crowding

	CPS	ACS	FFCWS
<i>Living arrangements/household instability</i>			
Doubled up	-0.018** (0.007)	-0.015*** (0.003)	-0.106*** (0.014)
Living in three-generation household	-0.020** (0.006)	-0.005** (0.002)	-0.046*** (0.012)
Doubled up (excluding three-generation households)	0.002 (0.005)	-0.010** (0.003)	-0.062*** (0.011)
Doubling up in someone else's home			-0.065*** (0.014)
Number of people in the household	-0.018 (0.019)	-0.040** (0.014)	0.970*** (0.047)
Number of relatives in the household	-0.036* (0.015)	-0.039** (0.013)	1.155*** (0.047)
Number of non-relatives in the household ¹	0.018+ (0.01)	-0.001 (0.003)	-0.072*** (0.020)
<i>Household crowding</i>			
Crowding		-0.022*** (0.004)	
Number of Observations	85,089	718,384	9928

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Fragile Families and Child Well Being Study (FFCWS) 1998-2016. Sample is restricted to single mothers with less than a college degree and with at least one coresident child under the age of 19. CPS/ACS also restricted to mothers ages 19-45. Single mothers residing in public housing are excluded from CPS/FFCWS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. CPS/ACS models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. FFCWS models include demographic and state contextual characteristics, year and individual fixed-effects. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; **p<.01; ***p<.001

¹ Cohabiting partners are considered "non-relatives" since it is difficult to distinguish cohabiting partners from roommates before the 1995 CPS.

Table 6. Effect of the EITC on housing outcomes, by age of the youngest child, CPS and ACS

	CPS: Youngest Child<6	CPS: Youngest Child 6+	ACS: Youngest Child<6	ACS: Youngest Child 6+
<i>Employment</i>	0.096***	0.071***	0.057***	0.030***
Worked last week	(0.017)	(0.014)	(0.007)	(0.005)
Annual earnings	<u>3.70***</u>	<u>2.013**</u>	2.320***	1.743***
	(0.782)	(0.674)	(0.246)	(0.289)
<i>Residential mobility</i>				
Moved since last year ¹	0.068***	0.015	-0.074***	-0.012*
	(0.011)	(0.013)	(0.005)	(0.005)
Positive move ³	0.033	0.029+		
	(0.023)	(0.015)		
<i>Housing instability</i>				
Moved because of foreclosure/eviction ³	0.009	-0.001		
	(0.01)	(0.007)		
<i>Housing affordability</i>				
Cost burden 30% mother's earnings			-0.031***	-0.026***
			(0.006)	(0.007)
Cost burden 50% mother's earnings			-0.051***	-0.027***
			(0.007)	(0.006)
<i>Living arrangements/household instability</i>				
Doubled up	-0.041***	-0.006	-0.014**	-0.016**
	(0.01)	(0.009)	(0.005)	(0.005)
Living in three-generation household	-0.036***	-0.016*	-0.005	-0.007**
	(0.007)	(0.007)	(0.003)	(0.002)
Doubled up (excluding three-generation households)	-0.006	0.010	-0.009	-0.009*
	(0.008)	(0.006)	(0.006)	(0.004)
Number of people in the household	-0.070**	-0.009	-0.054**	-0.045*
	(0.024)	(0.026)	(0.016)	(0.017)
Number of relatives in the household	-0.083***	-0.009	-0.052***	-0.047**
	(0.022)	(0.02)	(0.015)	(0.016)
Number of non-relatives in the household ³	0.014	0.000	-0.002	0.002
	(0.014)	(0.013)	(0.008)	(0.005)
<i>Household crowding</i>				
Crowding			-0.027***	-0.017***
			(0.005)	(0.005)
Number of Observations	36,088	49,001	326,464	391,920

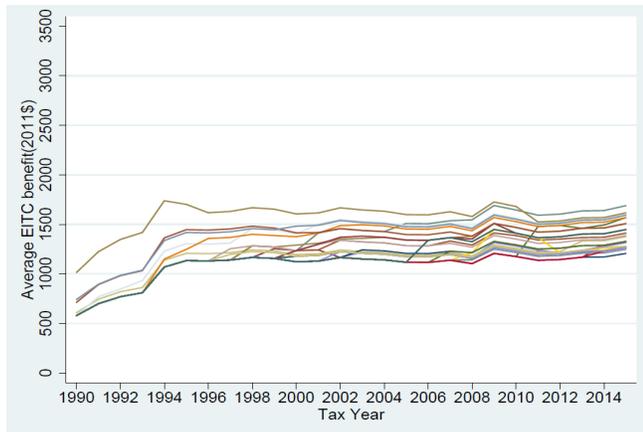
Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. Models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. Each cell represents a separate regression. All dollars are \$2011. Underlined estimates indicate significant differences between <6 and 6+ from chow tests. +p<.10; *p<.05; **p<.01; ***p<.001

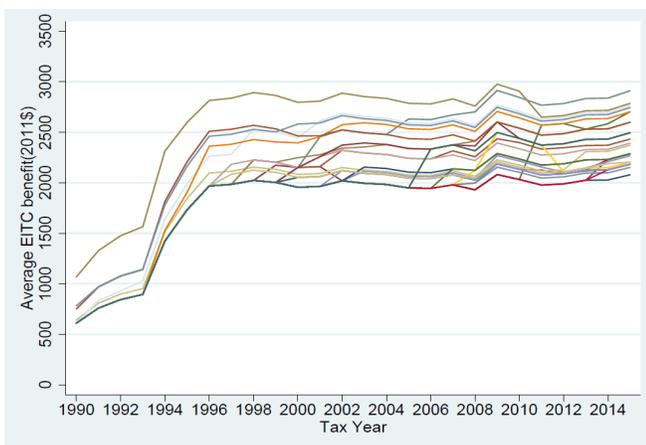
¹ Not available in 1995 CPS.

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

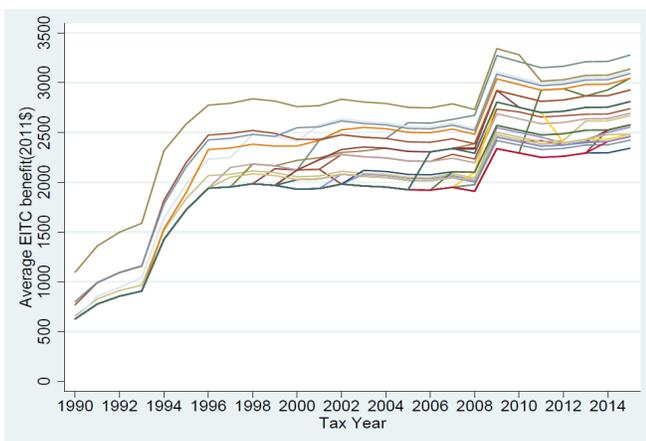
Fig. 1. Variation in simulated instrument, by state and number of children



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 19-45 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 EITC in the text for more details.

Appendix 1: Additional Information on Data, Measures and Specifications

This appendix provides additional information on 1) the American Community Survey (ACS)/Census data, on 2) the Fragile Families and Child Wellbeing (FFCWS) data, method and robustness checks, on 3) the Survey of Income and Program Participation (SIPP), and on 4) the modeling strategy used to compare one versus two child (and two versus three child) difference-in-difference analysis.

1) American Community Survey/1990 Census

We use the 2000-2016 American Community Survey (ACS) and the 1990 Census, representing tax years 1989, 1999-2015. The ACS is a nationally representative survey of the U.S. population that samples approximately 3 million households annually and is collected by the Census Bureau. We include the 1990 Census in order to have a comparison year prior to the large EITC expansions (in the mid-1990s). The ACS and Census data for this study were drawn from extracts made by the Integrated Public Use Microdata Sample (IPUS-USA; Ruggles et al., 2018).¹ We exclude individuals living in group quarters. We further restrict the sample to single mothers ages 19-45, without a college degree, resulting in a sample of nearly 720,000 mothers.² All analyses on the ACS are conducted like those in the CPS, with the exception that mothers in public housing are not excluded (this information is not available).

There are a few key differences between the ACS and the CPS.³ Unlike the CPS, which is conducted in March of every year, the ACS is conducted on a rolling basis and asks individuals

¹ Ruggles, S., Flood, S., Goeken, R., Grover, J., Meyer, E., Pacas, J. & Sobek, M (2018). IPUMS USA: Version 8.0 [dataset]. Minneapolis, MN: IPUMS. <https://doi.org/10.18128/D010.V8.0>

² Note, the ACS 2000-2004 are considered pilot years, as they have smaller samples and cannot be used for population estimates; however, the samples are still quite large.

³ Additional information on differences between the ACS and CPS are available here: <https://www.census.gov/topics/income-poverty/poverty/guidance/data-sources/acs-vs-cps.html>

about their income and other measures in the last 12 months; thus the time period varies somewhat across these two samples. As noted in the main manuscript, the ACS collects information on individuals in the household using a roster similar to that in the CPS; individuals in the household are identified with reference to the person (reference person) who is filling out the survey. Unlike the CPS, however, the ACS has the advantage (for the purpose of our study) of not requiring the respondent to be the named on the lease or be an owner of the unit. Rather, the ACS requires that the respondent be someone who has lived at the unit, or will live at the unit for at least two months and that the unit is their usual place of residence. Thus, although we restrict to respondents in our analyses, the ACS will capture respondents who are not necessarily the homeowners/renters. Despite these respondent advantages, and the inclusion of a few additional measure of housing (crowding and cost burdens), we do not use the ACS as our primary dataset because of the limited time frame. Although we can capture pre-post EITC expansions by including the 1990 Census, we are unable to exploit all of the individual expansions that occurred in the 1990s like we can when we use the CPS.

2) Fragile Families and Child Wellbeing Study

The Fragile Families and Child Wellbeing Study (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 states⁴ (representing tax years 1998-2015). 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

⁴ States in the FFCWS with EITCs include: CA, IL, IN, MD, MA, MI, NJ, NY, OH, VA, and WI.

nonmarital to 1 marital), resulting in a relatively economically disadvantaged sample and including many single mothers. We restrict the sample to single mothers, with less than a college degree and at least one child under 19 in the household. We also exclude mothers living in public housing. Because the FFCWS is a panel, we do not exclude mothers over 45 as we would largely exclude the last wave of data making the panel more unbalanced. The final sample is approximately 9,930 person-wave observations representing about 3,330 individuals. The sample varies occasionally across analyses as not all questions were asked in each survey wave.

In extensions we ran all the analyses for the FFCWS on a balanced panel, restricting to only mothers who were interviewed in all survey waves and the findings were very similar. Although we allow mothers in the sample to change marital status over time (contributing only to the estimates when they are unmarried), we also conducted an additional analysis restricting to mothers who were always single. Again, the findings were largely unchanged (although less precise as the sample was smaller).

We run a similar model in the FFCWS as we do in the CPS and ACS, but because the data are a longitudinal panel we include family fixed effects. 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 a particular housing outcome. 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 originally sampled (a relatively small share of mothers move states, 13%, in extensions we test models using current state, and dropping movers, and results 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:

$$(1) Y_i = \beta_0 + \beta_1 EITC_i + \beta_2 \alpha_{st} + \lambda_i + \gamma_t + \varepsilon_i$$

The individual fixed-effects model cannot control for time invariant characteristics (like state fixed-effects) but does include all of the contextual factors included in the CPS and ACS models. We do not include child fixed-effects in our main models (as this model already requires change in policy and within person change in housing, leaving little variation to explain the findings if we also require a change in the number of children), but in an extension, we included a linear control for number of children and found substantively similar findings.

The FFCWS is very different from the CPS and ACS as it is not a nationally representative sample, follows a birth cohort of children (birth to age 15), and only includes mothers living in large cities. The advantage of the FFCWS is that it allows us to examine within person change over time, thus avoiding problems whereby the sample of mothers might be changing in response to the EITC. The FFCWS also includes a number of additional housing related measures to examine (homelessness, eviction, being named on the lease) and because mothers are followed over time and household rosters are conducted with respect to her household, we can capture the full range of maternal living arrangements (do not select on homeowners/renters). However, we do not use the FFCWS as our main dataset because the sample is much smaller, only includes 15 states, and only covers 1998-2015 tax years. Thus, we cannot capture the full range of EITC policy expansions that occurred in the 1990s.

3) Survey of Income and Program Participation

We supplement the CPS, ACS, and FFCWS analyses with data from the SIPP

longitudinal panels from 1990 through 2008 (representing tax years 1989-2012). The SIPP conducts interviews once every four months regarding income and household composition over the previous four months. We restrict our sample to single mothers in the interview month (SIPP reporting month) as it is known to be more accurate (Moore 2008).⁵ As we do in the CPS, we restrict our sample to mothers ages 18-45 with some college or less and with at least one child under the age of 19. We also exclude mothers living in public housing. These restrictions produce a sample of 24,205 unique individuals with about 73,000 observations.

The structure of the SIPP is different from that of the CPS. The CPS ASEC is collected in March, and asks individuals about the prior year, whereas the SIPP is conducted on a rolling basis. Thus, although the measures can look back at the prior year, the prior year is not identical for all respondents like it is in the CPS. Like the CPS, the SIPP has a preference for a homeowner/renter to be the respondent and conducts a roster with reference to that respondent. Thus, we restrict our analyses to the respondent. For this reason, the SIPP offers few advantages over the CPS as it is a smaller sample. However, we use the SIPP as a robustness check because we can exploit the longitudinal nature of the SIPP to run individual fixed effects (it is a much shorter panel – on average 4 years – than the FFCWS) to follow the same mothers over time. The SIPP follows all individuals over age 15 who are in the sample household – those in the first wave of the survey. Thus, we restrict only to those individuals who were identified in the first wave of the panel as those who enter the SIPP household at a later wave are not followed. By restricting to those individuals in the first survey wave we can follow them as they move in and out of households over time. In the SIPP we follow the same methodological approach (individual fixed-effects) described for the FFCWS.

⁵ 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.

Employment, earnings, doubling up, and living in a three-generation household are coded the same in SIPP as in the CPS. Like we do in the CPS, we do not consider cohabiting couples to be doubled up. However, in the SIPP, prior to the 1996 panel, cohabiting partners were not explicitly identified in the household roster, and 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%).

The moving variable is slightly different in the SIPP – we have information on whether mothers have moved since the last survey wave (conducted every 4 months) and the number of moves (up to 3 in a year). We use this information to construct a variable that indicates whether mothers ever move in a panel and number of moves per panel.

4) Difference-in-Difference: Pre and Post 1993 OBRA EITC Expansion, Pre and Post 2009 ARRA Expansion.

We test the robustness of our results by using an identification strategy previously used in the EITC literature: comparing single mothers with two or more children to single mothers with one child before and after the large federal expansions to the EITC for households with at least two children in the early 1990s. Using this identification strategy, we estimate the following model:

$$(2) Y_i = \beta_0 + \beta_1 Twoplus_i + \beta_2 Post_i + \beta_3 Twoplus_i * Post_i + \beta_4 \alpha_{st} + \varepsilon_i$$

where $Twoplus_i$ is an indicator variable set to 1 if the single mother has at least two children, $Post_i$ is an indicator variable set to 1 if the year is after 1994, and $Twoplus_i * Post_i$ is the

interaction of these two terms. For this analysis, following previous work, we focus on the years 1989-1999. β_3 represents the coefficient of interest, and indicates whether there are changes in the outcomes of interest for single mothers with two or more children relative to single mothers with one child, after the federal EITC expansions that phased-in by 1994 relative to the years before the expansion, 1989-1993. For the ARRA expansion in 2009, we run the same model, but replace the variable *Twoplus* with an indicator for three or more children and we focus on the 2000-2016 time period. Here, the *Post_t* variable is set to one in the years after 2009, and zero otherwise.

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

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

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

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

**Denotes non-refundable credit.

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

Appendix Table 2. Effect of the EITC on housing instability and living arrangements, with state time trends

	CPS	ACS
<i>Residential mobility</i>		
Moved since last year ¹	0.026** (0.009)	-0.030*** (0.004)
Positive move ²	0.014 (0.015)	
Moved because of foreclosure/eviction ²	-0.001 (0.007)	
<i>Housing affordability</i>		
Cost burden 30% mother's earnings		-0.035*** (0.005)
Cost burden 50% mother's earnings		-0.046*** (0.005)
<i>Living arrangements/household instability</i>		
Doubled up	-0.021** (0.007)	-0.015*** (0.003)
Living in three-generation household	-0.021*** (0.005)	-0.005** (0.002)
Doubled up (excluding three-generation households)	0.000	-0.010*** (0.003)
Number of people in the household	-0.018 (0.017)	-0.040** (0.013)
Number of relatives in the household	-0.033* (0.014)	-0.039** (0.013)
Number of non-relatives in the household ³	0.014 (0.009)	-0.001 (0.004)
<i>Household crowding</i>		
Crowding		-0.023*** (0.004)
Observations	85,089	718,384

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. Models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific time trends. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; ***p<.001

¹ Not available in 1995 CPS.

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

³ Cohabiting partners are considered "non-relatives" since it is difficult to distinguish cohabiting partners from roommates before the 1995 CPS.

Appendix Table 3. Outcome and sample descriptives by age of the child, CPS and ACS

	CPS: Youngest Child<6	CPS: Youngest Child 6+	ACS: Youngest Child<6	ACS: Youngest Child 6+
<i>Moving outcomes</i>				
Moved since last year ¹	0.31	0.19	0.26	0.16
Positive move ²	0.15	0.08		
<i>Housing instability</i>				
Moved because of foreclosure ²	0.03	0.02		
<i>Housing affordability</i>				
Cost burden 30% of mother's earnings			0.76	0.66
Cost burden 50% of mother's earnings			0.58	0.44
<i>Living arrangements</i>				
Doubled up	0.16	0.14	0.13	0.11
Living in three-generation household	0.06	0.07	0.04	0.04
Doubled up (excluding three-generation households)	0.10	0.07	0.09	0.08
<i>Household instability</i>				
Number of people in the household	3.61 (1.39)	3.20 (1.17)	3.63 (1.40)	3.28 (1.22)
Number of relatives in the household	3.31 (1.32)	3.02 (1.10)	3.56 (1.36)	3.22 (1.18)
Number of non-relatives in the household	0.30 (0.56)	0.18 (0.46)	0.07 (0.34)	0.06 (.29)
<i>Household crowding</i>				
Crowding			0.14	0.06
<i>Maternal characteristics</i>				
Age	29.06 (6.02)	36.99 (5.24)	29.24 (6.05)	36.82 (5.23)
Number of children	1.93 (0.81)	1.68 (0.74)	1.96 (0.81)	1.74 (0.75)
<i>Race/ethnicity</i>				
Non-Hispanic white	0.47	0.54	0.47	0.54
Non-Hispanic black	0.24	0.22	0.28	0.26
Hispanic	0.23	0.18	0.21	0.17
Other race/ethnicity	0.06	0.05	0.04	0.03
<i>Education</i>				
Less than high school	0.23	0.17	0.18	0.14
High school diploma	0.39	0.40	0.48	0.47
Some college	0.38	0.43	0.34	0.39
<i>Earned Income Tax Credit (EITC)</i>				
Average simulated EITC (in \$1000s)	1.59 (0.60)	1.50 (0.57)	1.69 (0.61)	1.60 (0.60)
Eligible for the EITC	0.58	0.58	0.67	0.64
EITC credit (in \$1000s)	1.47 (1.70)	1.42 (1.65)	1.60 (1.73)	1.39 (1.61)
<i>Mother's earnings/employment</i>				
Working	0.58	0.73	0.63	0.74
Annual pre-tax earnings (in \$1,000s)	15.10 (22.44)	23.76 (27.00)	15.97 (19.83)	23.54 (24.39)
Number of Observations	36088	49001	304290	326790

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: All dollars in 2011\$. SD in parentheses. Except EITC eligibility, all differences between households with the youngest child <6 and 6+ are significantly different at p<.05.

¹ Not available in 1995 CPS

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

Appendix Table 4. Placebo tests: Effect of the EITC on employment, housing, and living arrangements among college-educated single mothers

	CPS	ACS
<i>Residential mobility</i>		
Moved since last year ¹	0.017 (0.019)	-0.016** (0.005)
Positive move ²	-0.001 (0.035)	
Moved because of foreclosure/eviction ²	0.010 (0.014)	
<i>Housing affordability</i>		
Cost burden 30% mother's earnings		-0.016 (0.017)
Cost burden 50% mother's earnings		-0.016 (0.013)
<i>Living arrangements/household instability</i>		
Doubled up	-0.001 (0.017)	-0.005 (0.006)
Living in three-generation household	-0.003 (0.01)	-0.006 (0.005)
Doubled up (excluding three-generation households)	0.002 (0.015)	0.001 (0.005)
Number of people in the household	0.008 (0.039)	0.019 (0.016)
Number of relatives in the household	0.04 (0.03)	0.033* (0.016)
Number of non-relatives in the household ³	-0.032 (0.019)	-0.014 (0.011)
<i>Household crowding</i>		
Crowding		-0.004 (0.005)
Observations	13,838	129,110

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. Models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; ***p<.001

¹ Not available in 1995 CPS.

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

³ Cohabiting partners are considered "non-relatives" since it is difficult to distinguish cohabiting partners from roommates before the 1995 CPS.

Appendix Table 5. Federal versus state variation: Effect of a \$1,000 increase in the EITC on employment, housing, and living arrangements

	CPS		ACS	
	Federal	State	Federal	State
<i>Residential mobility</i>				
Moved since last year ¹	0.029** (0.01)	0.060 (0.041)	-0.030*** (0.002)	-0.041+ (0.023)
Positive move ²	0.016 (0.019)	0.044* (0.022)		
Moved because of foreclosure/eviction ²	-0.003 (0.011)	0.006 (0.006)		
<i>Housing affordability</i>				
Cost burden 30% mother's earnings			-0.050*** (0.005)	-0.002 (0.021)
Cost burden 50% mother's earnings			-0.066*** (0.005)	-0.004 (0.022)
<i>Living arrangements/household instability</i>				
Doubled up	-0.026*** (0.007)	0.019 (0.026)	-0.018*** (0.004)	-0.007 (0.012)
Living in three-generation household	-0.024*** (0.006)	-0.011 (0.024)	-0.006** (0.002)	-0.004 (0.004)
Doubled up (excluding three-generation households)	-0.002 (0.005)	0.031 (0.022)	-0.012*** (0.003)	-0.003 (0.009)
Number of people in the household	-0.037+ (0.02)	0.105 (0.098)	-0.046** (0.017)	-0.022 (0.040)
Number of relatives in the household	-0.045** (0.017)	-0.001 (0.072)	-0.045** (0.016)	-0.026 (0.039)
Number of non-relatives in the household ³	0.009 (0.011)	0.105** (0.038)	-0.000 (0.004)	0.003 (0.012)
<i>Household crowding</i>				
Crowding			-0.023** (0.007)	-0.022 (0.015)
Observations	85,089		718,384	

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated federal (state) EITC benefit on outcomes holding constant the state (federal) EITC. Models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; ***p<.001

¹ Not available in 1995 CPS.

² Only available 1998-2016 CPS. Positive move is defined as whether the respondent reported moving for one of five reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; wanted better neighborhood; or for a new job.

³ Cohabiting partners are considered "non-relatives" since it is difficult to distinguish cohabiting partners from roommates before the 1995 CPS.

Appendix Table 6. Effect of a \$1,000 increase in the EITC on employment, housing, and living arrangements by housing tenure

	CPS			ACS	
	Homeowner	Renter	Subsidized renter	Homeowner	Renter
<i>Residential mobility</i>					
Moved since last year	0.013 (0.012)	0.033* (0.013)	0.043 (0.03)	-0.014*** (0.003)	-0.043*** (0.007)
Positive move ¹	0.044** (0.014)	0.015 (0.02)	0.080* (0.034)		
Moved because of foreclosure/eviction ¹	-0.001 (0.004)	0.002 (0.01)	-0.004 (0.02)		
<i>Housing affordability</i>					
Cost burden 30% mother's earnings				-0.038** (0.011)	-0.028*** (0.006)
Cost burden 50% mother's earnings				-0.038*** (0.009)	-0.046*** (0.007)
<i>Living arrangements/household instability</i>					
Doubled up	-0.002 (0.016)	-0.025*** (0.006)	-0.040** (0.013)	-0.010 (0.007)	-0.017*** (0.004)
Living in three-generation household	-0.016 (0.012)	-0.020*** (0.005)	-0.030** (0.008)	-0.002 (0.003)	-0.007** (0.002)
Doubled up (excluding three-generation households)	0.015 (0.009)	-0.004 (0.006)	-0.011 (0.009)	-0.007 (0.005)	-0.010** (0.004)
Number of people in the household	0.041 (0.041)	-0.034 (0.022)	-0.032 (0.053)	-0.001 (0.020)	-0.057*** (0.015)
Number of relatives in the household	0.006 (0.035)	-0.046* (0.019)	-0.019 (0.053)	-0.002 (0.017)	-0.056*** (0.014)
Number of non-relatives in the household	0.035+ (0.019)	0.012 (0.01)	-0.012 (0.015)	0.001 (0.006)	-0.001 (0.006)
<i>Household crowding outcomes</i>					
Crowding				-0.002 (0.004)	-0.030*** (0.005)
Observations	28,470	55,163	7,895	211,015	507,369

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. Models include demographic and state contextual characteristics, state, year, and number of child fixed effects, and state-specific pre-trends. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; ***p<.001

¹ Positive move is defined as whether the respondent reported moving for one of four reasons: to establish own household; wanted to own home, not rent; wanted new or better house/apartment; or wanted better neighborhood. Good move and foreclosure measures only available in tax years 1997-2016.

Appendix Table 7. Effects of the 1993 OBRA EITC expansion and 2009 ARRA expansion

	CPS: One kid vs two kids	CPS: Two kids vs three kids	ACS: Two kids vs three kids
<i>Residential mobility</i>			
Moved since last year ¹	0.020+ (0.012)	0.015 (0.009)	-0.013*** (0.002)
<i>Housing affordability</i>			
Cost burden 30% mother's earnings			-0.016*** (0.003)
Cost burden 50% mother's earnings			-0.015*** (0.003)
<i>Living arrangements/household instability</i>			
Doubled up	-0.012 (0.008)	-0.008 (0.008)	-0.008*** (0.002)
Living in three-generation household	0.005 (0.008)	-0.010+ (0.006)	-0.001* (0.001)
Doubled up (excluding three-generation households)	-0.017* (0.008)	0.001 (0.007)	-0.006*** (0.002)
Number of people in the household	-0.003 (0.024)	-0.009 (0.017)	0.005 (0.008)
Number of relatives in the household	0.008 (0.022)	-0.009 (0.016)	0.009 (0.008)
Number of non-relatives in the household ²	-0.011 (0.01)	0.0002 (0.007)	-0.004* (0.002)
<i>Household crowding</i>			
Crowding			0.005+ (0.003)
Observations	27,734	54,900	635,539

Source: Current Population Survey (CPS) 1990-2016. Census 1990/American Community Survey 2000-2016. Sample is restricted to single mothers ages 19-45 with less than a college degree and with at least one coresident child under the age of 19. Single mothers residing in public housing are excluded from CPS.

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the difference-in-differences effect of the 1993 OBRA/2009 ARRA EITC expansion on outcomes. OBRA compares single mothers with two or more children to single mothers with exactly one child before and after the expansion. ARRA compares single mothers with three or more children to single mothers with two kids before and after expansion. All models include demographic and contextual characteristics, state and year fixed effects. Each cell represents a separate regression. All dollars are \$2011.+p<.10; *p<.05; ***p<.001

¹ Not available in 1995 CPS

² Cohabiting partners are considered "non-relatives" since it is difficult to distinguish cohabiting partners from roommates before the 1995 CPS.

Appendix Table 8. Effect of the EITC on Housing Instability and Living Arrangements, Survey of Income and Program Participation, Individual Fixed-Effects

<i>Maternal employment outcomes</i>	SIPP
Working	0.009 (0.014)
Monthly earnings (in thousands)	0.038 (0.038)
<i>Residential mobility</i>	
Moved since last interview	-0.011 (0.008)
Moved at least once in the last calendar year	-0.020 (0.012)
Moved at least twice in the calendar year	-0.009+ (0.005)
Number of moves in the last year	-0.022 (0.014)
<i>Living arrangement/household instability</i>	
Doubled up	-0.057*** (0.01)
Living in three-generation household	-0.028** (0.008)
Doubled up (excluding three-generation households)	-0.029** (0.011)
Observations	72,866

Source: Survey of Income and Program Participation 1990-2008 panels. Single mothers aged 19-45 with some college or less with at least one child under the age of 19. Single mothers residing in public housing are excluded. Restricted to respondents only and only to those in the first wave of the survey (those who are followed over time).

Note: Standard errors, clustered at state level, in parentheses. Coefficients represent the effect of a \$1,000 increase in the simulated EITC benefit on outcomes. Models include demographic and state contextual characteristics, year and individual fixed-effects. Each cell represents a separate regression. All dollars are \$2011. +p<.10; *p<.05; ***p<.001