There's No Place Like Home:
Racial Disparities in Household Formation in the 2000s

Sandra Newman[1]
Scott Holupka[2]
Stephen L. Ross[3]

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[1]Johns Hopkins University, Bloomberg School of Public Health, 624 N. Broadway, Baltimore, MD 21205, USA; sjn@jhu.edu
[2]Johns Hopkins University, Bloomberg School of Public Health, 624 N. Broadway, Baltimore, MD 21205, USA; scott.holupka@jhu.edu
[3]Department of Economics, University of Connecticut, 365 Fairfield Way, U-1063, Storrs, CT 06269-1063

Abstract

This paper uses the Panel Study of Income Dynamics to explore the decisions of black and white young adults to remain in their parents' home or to form their own household during the tumultuous 2001-2013 period. We use MSA fixed effects to capture geographic heterogeneity and develop exogenous measures of housing and labor market contexts using Census and ACS PUMS data. We then run a Oaxaca-Blinder style decomposition analysis to explain the race gap in household formation over this 13-year period, and conduct several robustness checks. We find strong support for the influence of economic context, with strikingly different results by race. Blacks were most sensitive to rents, which increased more dramatically for black young adults over most of the 2001-2013 period compared with whites' rents. The results also suggest that blacks were operating in strongly segmented housing markets throughout this period. In contrast, whites were most sensitive to employment rates, which decreased for white young adults over this period from 75 percent in 2001 to 70 percent in 2013. Despite their unrestricted access to the entire labor market, falling employment proved a significant deterrent to new household formation for white young adults.

During the tumultuous 2000 decade, young adults were exposed to major changes in structural conditions occurring in rapid succession. The bursting of the tech bubble in 1999-2000 was followed by a mild recession in 2001 and 2002, then by a housing boom from 2003 through early 2007, and then by an economic recession including the bursting of the housing bubble starting in late 2007 with repercussions continuing beyond the decade. This period of strikingly different housing and labor market contexts provides a unique opportunity to study young adults' decisions to remain in their parents' home or form their own households. Three to four decades ago, young adults moved relatively easily into housing and labor markets. With less certain employment opportunities in changing labor markets, housing costs rising faster than incomes, and the turbulence of the recent housing boom and bust, the path to young adulthood, and particularly to independent household formation, is more strained than in the past (Mulder & Clark 2000). This has been especially the case for blacks who have been less likely than whites to follow the "standardized path" toward adulthood during the latter part of the 20th century (Fussell & Furstenberg 2005, p. 50). Black young adults live with their parents more often than whites (Settersten & Ray 2010). The volatile macroeconomic environment at the start of the 21st century may have amplified these race differences.

In this paper, we use the Panel Study of Income Dynamics (PSID) to examine how the economically volatile 2001-2013 period, which included the housing boom and the Great Recession (GR), influenced the decision by young adults to stay or leave their parents' home. Building on past studies (e.g., Haurin et al. 1993; Hughes 2003; Lee & Painter 2013), we account for two plausible influences on this decision: the structural context of housing and labor market conditions, and parental resources. The analysis considers whites and blacks separately because of the substantial racial disparity in young adult living arrangements, structural conditions and

family characteristics. This research extends the current literature in at least three ways. Previous work that includes the 2000 decade focuses on the GR (e.g., Lee & Painter 2013).[3] We include the 2001-2013 period, which encompasses the mild 2001 recession, the 2005 housing boom, the 2009 GR, and the after-match of the GR through 2013, in light of compelling evidence of different effects of sharp economic fluctuations on blacks compared with whites (e.g., Newman & Holupka 2016). Therefore, we test for possible differential effects of the period on black and white young adult household formation. Second, in addition to time fixed effects, we use metropolitan statistical area (MSA) fixed effects models to control for wide variations in economic conditions in housing and labor markets during this period (Chernick, Reschovsky & Newman 2016). Past research either does not use fixed effects or relies on state fixed effects. Third, we use the 2000 Census and the 2005, 2009 and 2013 ACS PUMS to create exogenous measures of the housing and labor market climate faced by young adults during this 13-year period. We view this analysis as largely exploratory and descriptive, providing a foundation for future research that tests causal pathways.

We find strong support for the influence of economic context, with strikingly different results by race. Blacks were most sensitive to rents, which increased more dramatically for black young adults over most of the 2001-2013 period compared with whites' rents. The results also suggest that blacks were operating in strongly segmented housing markets throughout this period. In contrast, whites were most sensitive to employment rates, which decreased for white young adults over this period from 75 percent in 2001 to 70 percent in 2013. Despite their unrestricted access to the entire labor market, falling employment proved a significant deterrent to new household formation for whites.

[3] Lee and Painter focus on the effects of recessions in several decades on young adults leaving home.

In the next section, we set the context for this analysis by presenting recent trends on young adults living with parents, their educational attainment, earnings, housing choices and housing cost burden. The third section reviews the literature and is followed by the hypotheses guiding the analysis. Next, we describe the research approach including data, sample, and methods. We then review the results and robustness checks. We discuss the results and their interpretation in the final section.

Setting the Context[4]

Living with Parents

An increase in the share of young adults living with their parents has received considerable media attention since at least the 2000s. According to Current Population Survey (CPS) data, more than half of 18-24 year olds began the decade living at home. This fraction then fell to about 50 percent in 2005 at the height of the housing boom, returned to roughly 52 percent in 2008 during the GR, and continued to increase to 55 percent through 2015, the last year for which CPS data were available at this writing. The pattern for 25-34 year olds is somewhat different. Nearly 11 percent lived with parents in 2000, and this fraction remained largely stable through the housing boom. This percentage rose to about 13 percent in the GR in 2008 and has continued a modest but steady increase to 15 percent in 2015.[5] These patterns may reflect the increase in school enrollment and the decrease in employment rates and earnings among young adults. The trends in living arrangements do not vary dramatically by race except for the longstanding pattern that blacks at

[4] Estimates and analysis discussed in this section are included in a technical appendix to this paper available from the authors.

[5] Authors' calculations using data obtained from http://www./.census.gov/data/tables/time-series/demo/families/adults.html infoplease.com/ipa/A0193723.html Young adults in school are included in estimates of those living with parents.

all ages are more likely to live with parents than whites (Qian 2012; Settersten & Ray 2010). In 2016, 37 percent of blacks 18 to 34 lived with their parents compared with 30 percent of whites in this age group (U.S. Bureau of the Census 2017, p. 7).

Household Formation and Housing Choice

Although young adults 18-34 comprise a relatively small share of heads of households, Dunne (2012) estimates that they account for nearly three-fourths of the overall shortfall in household formation since the GR. As indicated by the trend in living with parents by age noted above, 18-24 year olds had the largest shortfall in household formation. Dunne's analysis indicates that nearly 2 million more households headed by an 18-34 year old were projected to be formed between 2007 and 2011 than were actually created. Although a change of roughly 3 percentage points may sound modest (Danziger & Rouse 2007), it translates into millions of 18-34 year olds who did not establish their own households.

The specific nature of the GR also had implications for housing choice among young adults leaving their parents' home. Before the GR, about one-third of 18-34 year olds headed their own households, and roughly 40 percent of this group was homeowners. With the bursting of the housing bubble and onset of the financial crisis, lending standards were tightened, and access to mortgage credit was reduced. Presumably as a result, a sizable share of young adults leaving home opted to be renters instead of homeowners, producing a decline of nearly 5 percentage points in this subgroup's homeownership rate from pre-GR through 2010-2012 (Dunne 2012).

Educational Attainment

All else equal, an economic boom should lower the likelihood of college attendance if it improves job prospects enough so that the opportunity cost of attending college is less than the

benefits of entering the labor force (Card & Lemieux 1997). Conversely, an economic recession should increase the appeal of attending college.

CPS data do not support a decline in educational attainment during the boom. But they do confirm an increase in college attendance during the GR for particular subgroups of young adults (not shown). Among whites 18-24 years old, there was an increase in completing some years of college beginning in 2008 and continuing beyond the end of the decade (i.e., 42 percent in 2008 grew to 45.2 percent in 2013). This uptick in college attendance is also evident among blacks in the 25-29 year old age group beginning in 2009, a year later than whites, and continuing beyond the decade (i.e., 36.1 percent in 2009 grew to 41.6 percent in 2013). The increase in attending college but not in receiving a college degree during the GR is consistent with the argument by Charles et al. (2015) that the economic climate is most likely to affect young adults "on the margin" of obtaining a 2-year degree.[6]

Earnings and Employment

As with educational attainment, support for the opportunity cost hypothesis among young adults differs by subgroup. CPS data reveal a decline in average real earnings among blacks, but not among whites, during the GR. For blacks, this pattern holds for both full-time and part-time workers, and for both 18-24 year olds and 25-34 year olds.[7] These earnings reductions were exacerbated by declining employment rates for full-time workers that also began in the GR and continued at least through 2011.[8] Full-time employment rates fell for both blacks and whites and

[6] Charles et al. (2015) found a decline in attending some college during the housing boom in a sample of housing markets that were heavily affected by the boom.

[7] For example, among full-time workers 18-24 years old, blacks' earnings fell by about $2,000 between 2008 and 2009 (from $22,801 to $20,802, respectively). For whites in the same age and full-time group, earnings held steady at about $24,000.

[8] For example, among full-time workers 18-24 years old, the employment rate fell from 34.4 percent to 28.4 percent between 2008 and 2009 among blacks, and from 41.3 percent to 35.7 percent for whites.

for both younger and older young adults. By 2015, the latest data available, rates were climbing back up but were still several percentage points below their peak in 2006 and 2007. Throughout this time period, average earnings and rates of full-time employment were always lower for blacks than whites.

Housing Market Conditions

Figure 1 demonstrates that the housing market for owners and renters was not particularly hospitable in the 2000s. As is well known, 2005 was the pivot point between the dramatic rise and equally dramatic fall in house prices. The rental market is generally more relevant for young adults living with their parents because moving out on one's own usually means renting. The figure shows that real rents did not experience the volatility of house prices: rents increased steadily, rising about 12 percent over the decade (Woo 2016). During the same period, young adults' unemployment rates were increasing and their employment rates and earnings were decreasing. Thus, for the self-selected group of young adult renter's 21-24years old, the average housing cost burden increased throughout the 2000-2013 period: 41 percent in 2000, 44 percent in 2005, 45 percent in 2009, and 46 percent in 2013.[9] On average, then, the rental market was not much more receptive to young adults forming independent households in the boom than in the GR, or the reverse, although local rental markets undoubtedly deviated from the average case.

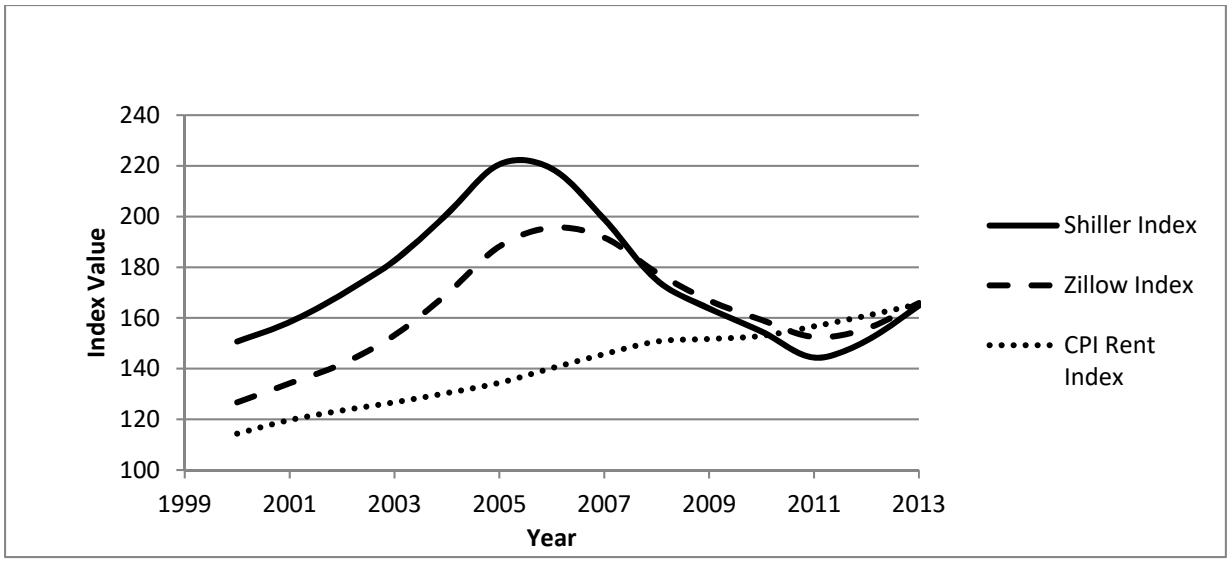
Literature Review

Over roughly the last two decades, a body of literature has emerged about the effects of economic conditions on young adult living arrangements, and particularly whether young adults remain in the parental home. Parents are described as "dampening" the effects of the young adult's low income (Card & Lemieux 1997) and "smoothing" young adults' consumption (Matsudaira

[9] Authors' calculations using ACS PUMS data from 2000, 2005, 2009 and 2013 (Ruggles et al., 2015). Data not available for 2001 so we use 2000.

2016). This body of work generally recognizes the likely influence of housing market conditions on decisions by young adults to establish independent households by including one or more controls for house prices or rents in multivariate models. Several studies account for family resources, typically by including a control for parents' income, with Lee and Painter (2013) adding

Figure 1. Price and rent indexes, 2000 – 2013



Sources:
1. Shiller: US National Housing Price Index (inflation adjusted to June 2016$). Data from Robert Shiller's book Irrational Exuberance and Standard & Poor's www.multpl.com/case-shiller-home-price-index-inflation-adjusted/table
2. Zillow: Zillow Home Value Index (ZHVI) for all homes in United States (ZHVI for December of each calendar year). www.zillow.com/research/data/#median-home-value
3. CPI Rent: Consumer Price Index for All Urban Consumers: Rent of primary residence, Index 1982-1984=100, Monthly, seasonally adjusted data from Economic Research Division, Federal Reserve Bank of St. Louis. https://fred.stlouisfed.org

wealth measures. Despite differences in time periods, methods, data sources and measure, the large majority of this research finds statistically significant and substantively important effects of economic conditions on young adult decisions to remain in their parents' home, and larger effects of housing market climate than labor market conditions on blacks than whites.

Haurin et al. (1993) perform a cross-sectional analysis of the 1987 wave of the 1979 National Longitudinal Survey of Youth (NLSY) and find that real rents, the authors' proxy for housing affordability, has a larger effect on leaving the parental home than predicted earnings. The effects of both of these economic measures are largest for blacks and Hispanics.

Whittington and Peters (1996) use data from the 1969-1988 Panel Study of Income Dynamics (PSID) to test discrete hazard models. The authors' measures of whether the young adult can afford to leave home include a measure of predicted earnings, AFDC benefits, the state unemployment rate, and regional gross rent divided by the state wage rate. They also control for parents' income, family size, whether both parents were present when the young adult was 14, and geographic region. The authors find a positive and significant effect of the young adult's predicted wage but no effect of rent, in contrast to Haurin et al. (1993), and speculate that their use of an aggregate regional rent measure accounts for its insignificance.

Hughes (2003) uses the 1990 Census Public Use Microdata (PUMS) in a cross-sectional analysis of the effects of labor and housing markets on a range of living arrangements of young adults aged 18-30. Like Haurin et al. (1993) and Whittington and Peters (1996), she controls for earnings and rent, specifically the young adult's predicted earnings and the average gross rent of a 1-bedroom, 3-room apartment in the metropolitan area. She finds that whites follow the expected pattern of remaining in the parents' home when predicted earnings are low and rents are high, while blacks have a more consistent pattern for rent than earnings. Hughes' earnings and rent measures are likely to be more precise than those used by others because she bases her analysis on metropolitan areas, a typical approximation for housing and labor markets.

Yelowitz (2007) uses 1970-2000 Census PUMS data in a regression analysis of the extent to which the cost of living, and particularly housing costs, explain trends from 1980 to 2000 in the

living arrangements choices of young adults 18-34 years old. The author accounts for the influence of housing costs with two metropolitan area measures: the Office of Federal and Housing Enterprise Oversight quarterly house price index, and the U.S. Department of Housing and Urban Development's (HUD) Fair Market Rents (FMR). To account for labor market conditions, he includes the unemployment rate of either the MSA or state and the young adult's prior year's earnings. Yelowitz finds that labor market and housing market conditions operate as expected, with higher unemployment rates and house prices reducing independent household formation, although his rent measure is not statistically significant. He also finds minorities are much more responsive to house price changes than whites, resulting in lower nonwhite household formation.

Hill and Holzer (2007) use the NLSY79 and NLSY97 to explore the role of labor market conditions in the change in living arrangements of young adults between 1984 and 2002. During this period, real wages, work hours, and weeks worked increased for all NLSY respondents. The authors test models with and without controls for labor market conditions measured by previous year's work hours and hourly wage, and find little difference in trends by education, race or gender. We include the Hill and Holzer paper in this review because they conclude that the rising costs of living, and particularly the cost of housing, may have a greater effect later in the 2000 decade.

Lee and Painter (2013) use the PSID to study the effects of the six recessions during the 1975-2009 period on the decision of young adults ages 18-35 to either continue to live with parents, become a homeowner, or become a renter. Most pertinent to our analysis are the findings about remaining with parents or leaving, regardless of housing tenure. The authors use year dummies for NBER-designated recessions and account for labor market conditions with state unemployment rates, average wages, and GDP growth rates. In their main multinomial logit models, Lee and Painter control for housing market conditions with state annual median house prices and gross

rents, noting that they also tested Census or ACS-interpolated annual census tract rents, a housing price index, and HUD FMRs. They find that household formation declined during recessions and most strongly in the GR, with a much larger effect for blacks than whites. Although the effects of depressed labor markets are statistically significant and roughly similar in size for both blacks and whites, blacks did not react significantly to higher rents, while whites did. This result is inconsistent with much of the literature (Hughes 2003; Haurin et al. 1993; Yelowitz 2007; Matsudaira 2016). Haurin and colleagues studied 1987, which was not a recessionary year, but Hughes' analysis focused on 1990, which was.

Matsudaira (2016) uses Census and ACS data covering 1960-2011 in a series of difference-in-difference state fixed effects models to estimate reduced-form effects of changing economic conditions on the likelihood that young adults lived with their parents over the last five decades (p. 193). He controls for labor market climate with the state employment rate for 35-44 year old males and predicted wages, and for housing market climate with state average rent. He concludes that the effect of economic factors alone, and particularly the housing cost of independent living, overwhelms all other factors in accounting for the secular decrease in young adult household formation since 1970. Like most others, he finds stronger effects of housing cost on blacks than whites. For example, a 10 percent increase in monthly rent increases the fraction of black men ages 25-29 living with their parents by 2.5 percent, roughly twice as large as the effect on young white men (1.2 percent).

In the current paper, we build on this literature in several ways. First, much of this work, covering both strong and weak economic conditions, finds that housing cost is the most important economic climate indicator in the household formation decision, often followed by earnings (Hughes 2003; Haurin et al. 1993; Yelowitz 2007; Matsudaira 2016). We build on this finding

by viewing housing cost as the key economic challenge the young adult must overcome to form a new household. We address the endogeneity of the young adult's housing cost, earnings and employment by using population-based estimates from Census' ACS PUMS data and not the observed values for individuals in the analysis sample (e.g., Hughes 2003; Matsudaira 2016). We estimate MSA fixed effects models because unobserved geographic features could be correlated with economic climate. We also build on prior work (e.g., Lee & Painter 2013; Whittington & Peters 1996) by controlling for the family's financial resources. Finally, similar to all of the articles reviewed here, we examine differences by race.

Conceptual Framework

This analysis draws on two theoretical perspectives. First, life course theory emphasizes the role of the historical or structural setting in the transition to adulthood (e.g., Hogan & Astone 1986; Raymore et al. 1999; Shanahan et al. 1997; Grotevant 1998). This work demonstrates that the historical period or setting in which a cohort lives can affect its trajectory. Elder's work on the lifetime influence of the Great Depression on the future of male cohorts (Elder 1974; Elder & Hareven 1994) is a vivid example of this theory, and provides evidence of strong historical period effects.

This perspective informs our examination of the influence of labor market and housing market contexts on young adult outcomes. Through the 2000s, wage rates have remained essentially flat in real terms (BLS 2001-2010), while unemployment increased from less than 5 percent in 2001 to more than 10 percent in 2009, the largest post-WWII increase (Elsby et al. 2010). The state of the housing market, and particularly housing affordability, may have imposed structural constraints on young adults' choices because housing costs are directly related to the price of living independently (Hughes 2003; Myers & Wolch 1990). Because leaving the parental

home has typically been the first step in the life course of household creation and housing market participation, housing unaffordability is a barrier to this transition (Mulder & Clark 2000). Since housing costs command the lion's share of the typical household's budget, housing affordability is the threshold test for whether young adults can form their own households. As described earlier, the decline in real wages for black young adults and in employment rates for all young adults during the GR, and the increase in real rents across the 2000 decade and beyond it, made this threshold particularly difficult to cross.

The second perspective we draw upon is the family investments model (Becker 1981; Becker & Thomes 1986). This model hypothesizes that family financial resources will affect the young adult's household formation decision. But the direction of this effect is ambiguous, as noted by several previous papers (e.g., Whittington & Peters 1996; Lee & Painter 2013). For example, Whittington and Peters (1996) describe the complexity of the "stay-leave" decision drawing on the economics of the family and human resources (e.g., Becker 1991). All else equal, the greater the parents' financial resources, the more likely the young adult will remain at home because of the greater attractiveness of that option. But if the young adult values independent living or the parents value their privacy, parents with the financial wherewithal may be willing to subsidize their children's leaving to form their own household.

Arguably, these two theories apply to the volatile 2001-2013 period and to both blacks and whites. It is difficult to predict at what point during this 13-year period the influence will be stronger and how this varied by race. Unlike previous and milder recessions, one of the markers of the GR was its impact on the middle class, and not only on those with low incomes. It is plausible that there will be less difference across income groups—other than the most affluent—than would be the case in a milder downturn. Thus, except for the affluent, basic economics

suggests that young adults would have encountered difficulties attempting to establish independent households throughout the time period, and in both the boom and the bust. From a housing market perspective, even though rents did not increase as much as home sales prices during the boom, incomes were rising slower than rents, making household formation difficult. Although the labor market situation is more mixed, with a greater probability of earnings from work during the economic boom, whether these earnings would be sufficient to sustain household formation is questionable, as the aggregate data on young adult living arrangements suggest. The strong correlation between income and race provides some basis for expecting differences between blacks and whites, all else equal. But all else is not equal between blacks and whites, making predictions about differences by race much more difficult.

Research Approach[10]

Data

The primary database for this study is the Panel Study of Income Dynamics (PSID), an ongoing longitudinal survey of American households begun in 1968 by the University of Michigan Survey Research Center. Annual interviews were conducted through 1997, with biennial interviews thereafter. The original sample of 5,000 families has been followed over time, along with new families who split off from these families. The sample was adjusted in 1997 to reflect demographic changes primarily from immigration. Low-income families were originally oversampled and, despite greater attrition among this subgroup, remain overrepresented. Statistical weights adjust for nonresponse and representativeness. We enrich the PSID with information on the rent, earnings and employment of comparable young adults in the same time

[10] All estimates and analysis discussed in this section that are not reflected in figures or tables are documented in a technical appendix available from the authors on request.

periods and locations using data from the American Community Survey Public Use Microdata samples (ACS-PUMS).

Samples

To examine young adult stay-or-leave decisions in the 2001-2013 period, we construct four analysis samples from the PSID. Each sample is restricted to individuals identified as non-Hispanic black or white and who can be tracked from adolescence (here defined as ages 13-16) through young adulthood (here defined as ages 21-24) in the outcome year (2001; 2005; 2009; 2013).[11] For this analysis, we adopt 2005 to reflect the boom and 2009 to reflect the GR.

Measures

Dependent Variable

The outcome measure is whether the young adult lives with their parents in the outcome year, 2001, 2005, 2009, or 2013.[12]

Contextual Characteristics

To reflect the historical and structural settings in the transition to adulthood in accordance with life course theory, we capture the housing and labor market conditions facing the young adults in the analysis samples with measures of the average gross rent, annual wage (in 2013$), and employment rate of those working at least 30 hours/week for white and black 20-25 year olds living in the same housing and labor markets defined as MSAs.[13] These economic climate

[11] Sample properties are as follows: 2001: 285 blacks and 455 whites who were 13-16 in 1993; 2005: 420 blacks and 546 whites who were 13-16 in 1997; 2009: 489 blacks and 518 whites who were 13-16 in 2001; and 2013: 567 blacks and 551 whites who were 13-16 in 2005. Sample sizes are net of missing data.
[12] We include young adults living with other relatives under the "living with parents" umbrella. More than 90 percent of the young adults classified as "living with a parent" are living with one of their parents. The remainder are living with a grandparent (5 percent) or with an aunt/uncle (1-2 percent). Young adults living in institutional arrangements (e.g., military; college dorm) are not considered to be living with parents.
[13] Roughly 80 percent of cases have MSA data. For the remainder, we relied on state data.

measures come from the 2000 Census PUMS and the 2005, 2009, and 2013 ACS PUMS.[14] The effects of housing or labor market conditions on household formation could be driven by overall changes in rents, earnings or employment or, instead, by changes in rents, earnings or employment of young adults distinguished by their race. The latter suggests that young adults of different races may be operating in different housing and labor submarkets. To test this possibility, we created measures of average rent, earnings and employment rate using two different classifications: (1) time and MSA; and (2) race, time and MSA. The time x MSA measures compute average rent, earnings and employment rates for black and white young adults combined living in a particular MSA in a particular year. These contextual measures assume that black and white young adults operated in similar housing and labor markets. The race, time and MSA measures compute average rent, earnings and employment for black and white young adults separately. These measures allow us to examine whether black and white young adults operated in separate housing and labor markets

Parental Resources

To test the family investments hypothesis, we include three measures of parental resources: parents' permanent income, parents' wealth including home equity, and the mother's education. Education is included because more highly educated mothers may be better equipped to foster healthy child development. Permanent income is measured as the average of the parents' total income in the five years prior to the outcome year. The PSID measures wealth with equity in all four outcome years (2001, 2005, 2009, and 2013). Mother's education is measured during the young adult's adolescence.

[14] Because ACS data collection did not begin until the middle of the 2000s, we use PUMS data for the 2000 census to obtain comparable information for the 2001 sample as for the 2005, 2009, and 2013 samples. All data obtained from IPUMS-USA (Ruggles et al. 2015).

Family Structure in Adolescence

Following Whittington and Peters (1996), we include whether the parents were married during the young adult's adolescence.

Demographics

Beyond indicators to test the two theories, we include demographic controls that have demonstrated, or plausible, associations with leaving the parents' home. These are the young adult's gender, age, and education, household size (excluding the young adult) in the parental home in the outcome year, and the mother's age when the young adult was an adolescent (13-16 years old).

Fixed Effects

We use MSA fixed effects to account for the heterogeneity of housing and labor market conditions during 2001-2013. We assign individuals to the MSA in which they resided during adolescence. All models also include year dummy variables to account for temporal effects that are not captured by changes in housing and labor markets measures (e.g., growing acceptance of young adults remaining in their parents' home as "normal"). Because the GR was the most significant economic shock during this time period, 2009 is the excluded reference year.

Missing Data

Missing data are extremely limited. Only five of the 13 covariates in the outcome models have any missing data and it ranges from 1-3 percent. We exclude cases with any missing data, which reduces the size of each of the four analysis cohorts by about 10 percent.

Methods

The base model (1) is:

$$(1)\quad YA_{it} = B_0 + B_1 Year + B_2 YARent_{MSA} + B_3 YAEarn_{MSA} + B_4 YAEmploy_{MSA} + B_5 Family\ Resources + B_7 Family\ Structure + B_8 Demographics + e$$

where YA_{it} is the likelihood that individual *i* at time *t* lives with parents. The model considers this outcome to be a function of the year observed, contextual characteristics of average MSA gross rent, earnings and employment of comparable young adults in the same labor and housing markets, family resources (B_5Family Resources), family structure (B_7Family Structure) and demographics (B_8Demographics).

Model (1) does not include MSA fixed effects. Therefore, it assumes no geographic differences in household formation beyond the contextual, family, and demographic characteristics and year dummy variable covariates. To account for possible location differences, we estimate a second set of models of the form:

$$(2)\quad YA_{ist} = B_0 + B_1 Year + B_2 YARent_{MSA} + B_3 YAEarn_{MSA} + B_4 YAEmploy_{MSA} + B_5 Family\ Resources + B_7 Family\ Structure + B_8 Demographics + \phi_{MSA} + e$$

Model (2) adds MSA fixed effects, ϕ_{MSA}, to account for unobserved, time-invariant geographic differences. Similar to Matsudaira (2016), the fixed effects model is a type of differences-in-difference model, where we use the variation over time in the effect of contextual factors within each MSA to identify the model while controlling for time-invariant MSA characteristics. We estimate models (1) and (2) twice, once using the time by MSA measures of rent, earnings, and employment, and once using race by time by MSA contextual measures. We estimate all models using OLS with robust standard errors.[15] Although the household formation outcome is measured dichotomously--whether the young adult stays or leaves the parental home--the split between the "stay or leave" categories is not highly skewed, with the fraction of stayers ranging from 32-54 percent depending on the sample. Because the OLS and logistic models produce similar results,

[15] We use robust standard errors, in part, because 29-35 percent of our samples are comprised of siblings (29 percent in 2001 and 2005, 32 percent in 2009, and 35 percent in 2013). These rates are nearly identical for blacks and whites in each year.

we report those from the OLS models for simplicity. We estimate all models separately for black and white young adults, which is supported by a Chow test.

We then present marginal analyses that combine descriptive findings about the housing and labor markets faced by young adults throughout this period with the regression model results. Next, we use a Oaxaca-Blinder style decomposition analysis to further elucidate the gap in household formation between black and white young adults. This analysis estimates how much of this gap is accounted for by the observables included in the model and how much is attributable to the coefficients on these observables; that is, changes in the relationship between these characteristics and race over the 2001-2013 time period (Oaxaca 1973; Blinder 1973).

In a last step, we conduct four robustness checks on the regression results. First, we stress test the result that rent played a more important role in young adult household formation decisions that earnings or employment. Specifically, because average MSA rents are highly correlated with average MSA earnings and employment rates, the two labor market measures, the rent measure could be suppressing the effects of earnings, employment, or both. Therefore, we retest the models excluding rent. Second, because the young adult's education is potentially endogenous (e.g., Haurin et al. 1993), we assess the sensitivity of results to the inclusion or exclusion of the young adult's education measure. Further, because some young adults may be living apart from their parents because they are attending college, we added interactions between whether the young adult was in college and average rent, earnings and employment. Finally, we re-estimate the models using a logistic specification instead of OLS because the dependent variable, whether the young adult remained at home or not, is dichotomous.

Results

Sample Characteristics

Table 1 provides a comparison of black and white young adults in the 2001, 2005, 2009 and 2013 analysis samples. Consistent with aggregate data, black young adults were more likely to live with their parents than whites were in all four years. This gap widens most dramatically between the boom and the GR: black young adults were 26 percent more likely than white young adults to remain at home in the boom but 42 percent more likely in the GR. Interestingly, between the GR and 2013, the rate of living at home increased for both whites (35 to 42 percent, respectively) and blacks (50 to 54 percent, respectively), Whether this increase represents the overhang of the GR, the recovery from the GR as reflected in house prices (see Figure 1), cultural or secular changes is uncertain.

However, the pattern of whether the young adult formed a new household or remained at home is distinct for blacks and whites. Black young adults were roughly 13 percent less likely to live with parents in the housing boom than in the mild 2001 recession (47 percent in 2005; 53 percent in 2001). This pattern reverses in the next two time periods, with remaining at home growing by 6 percent between the boom and the GR (from 47 percent to 50 percent, respectively), and by 9 percent between the GR and 2013 (from 50 percent to 54 percent, respectively). White young adults also were less likely to live with parents in the boom than in 2001, with a dramatic 30 percent decline between these two years (48 percent in 2001; 37 percent in 2005). This decline continued, albeit at a slower pace of 5 percent, between the boom and the GR (37 percent in 2005; 35 percent in 2009). Like blacks, whites were more likely to live with their parents in 2013 than 2009, but their increased rate of 19 percent is substantially greater than the increase in living at home for blacks (35 percent in 2009; 42 percent in 2013).

Table 1: PSID sample characteristics by race and year

	White 2001	**Black 2001**	*p*	**White 2005**	**Black 2005**	*p*
Observations	(455)	(285)		(546)	(420)	
YA remains in parents' home	48.0 (50.0)	52.6 (50.0)	.342	37.0 (48.3)	46.5 (49.9)	.022
Average YA rent (Time x Race x MSA)	$923 (209)	$739 (149)	.000	$993 (266)	$884 (179)	.000
Average YA earnings (Time x Race x MSA)	$20,988 (2,598)	$17,522 (3,438)	.000	$19,198 (2,276)	$15,514 (3,121)	.000
% YA employed (Time x Race x MSA)	75.0 (4.8)	60.0 (6.0)	.000	74.0 (4.2)	57.6 (10.5)	.000
Parents permanent income	$120,207 (86,554)	$57,163 (39,079)	.000	$146,749 (130,547)	$61,437 (44,471)	.000
Parents wealth w/equity	$369,783 (784,573)	$55,043 (128,903)	.000	$594,968 (227,372)	$97,773 (321,322)	.005
Mother's education (years)	13.5 (2.1)	11.8 (2.4)	.000	13.8 (2.3)	12.5 (2.1)	.000
Parents married (in adol.)	78.7 (41.0)	40.3 (49.1)	.000	83.7 (37.0)	40.8 (49.2)	.000
YA gender (male)	51.7 (50.0)	50.6 (50.1)	.816	45.5 (49.8)	50.9 (50.1)	.208
YA age	22.3 (1.2)	22.4 (1.1)	.706	22.4 (1.2)	22.2 (1.2)	.210
YA education (years)	13.7 (1.9)	12.6 (1.6)	.000	13.2 (2.0)	12.4 (1.5)	.000
Currently in school	10.3 (30.4)	6.9 (25.4)	.248	9.8 (29.8)	7.3 (26.1)	.315
Household size	2.5 (1.1)	2.9 (1.5)	.000	2.5 (1.1)	2.8 (1.7)	.002
Mother's age	41.3 (4.9)	38.9 (6.4)	.000	42.1 (5.2)	39.3 (6.6)	.000

Table 1: PSID sample characteristics by race and year (con't)

	White 2009	**Black 2009**	*p*	**White 2013**	**Black 2013**	*p*
Observations	(518)	(489)		(551)	(567)	
YA remains in parents' home	35.4 (47.9)	50.1 (50.1)	.000	42.1 (49.4)	54.3 (49.9)	.001
Average YA rent (Time x Race x MSA)	$1,107 (286)	$1,007 (270)	.000	$1,112 (303)	$909 (203)	.000
Average YA earnings (Time x Race x MSA)	$18,479 (2,205)	$14,433 (4,479)	.000	$16,663 (2,077)	$12,157 (2,199)	.000
% YA employed (Time x Race x MSA)	71.3 (4.3)	53.5 (14.9)	.000	70.5 (4.5)	56.6 (7.7)	.000
Parents permanent income	$163,614 (275,374)	$59,330 (43,326)	.000	$140,612 (150,284)	$58,886 (59,835)	.000
Parents wealth w/equity	$726,107 (2,370,117)	$82,820 (390,503)	.000	$476,814 (1,036,778)	$32,834 (105,075)	.000
Mother's education (years)	13.8 (2.1)	12.4 (2.5)	.000	14.0 (2.1)	12.6 (1.9)	.000
Parents married (in adol.)	85.2 (35.5)	41.5 (49.3)	.000	82.1 (38.4)	34.7 (47.7)	.000
YA gender (male)	49.5 (50.0)	49.7 (50.1)	.954	47.7 (50.0)	47.5 (50.0)	.969
YA age	22.3 (1.2)	22.5 (1.2)	.149	22.0 (1.4)	22.2 (1.2)	.204
YA education (years)	13.2 (1.9)	12.6 (2.0)	.000	13.0 (2.2)	12.2 (1.6)	.000
Currently in school	6.7 (25.0)	8.9 (28.5)	.300	9.0 (28.6)	9.6 (29.5)	.763
Household size	2.5 (1.1)	2.7 (1.8)	.118	2.5 (1.1)	2.4 (1.5)	.125
Mother's age	42.5 (5.2)	41.6 (6.8)	.040	43.6 (5.8)	41.0 (7.0)	.000

Notes

1. Unweighted N, PSID weighted samples.
2. YA = young adult.
3. Mean (standard deviation)
4. *p* = *p*-value of black/white difference
5. All dollars CPI-adjusted to 2013$
6. Parents' wealth = total assets, including home equity, in outcome year.
7. Parents married = parent's marital status measured when young adult was adolescent.
8. Household size = number of people in parent's household at outcome, excludes young adult if living with parents.
9. Mother's age = mother's reported age when young adult was adolescent.
10. Average YA rent, earnings and employment based on time by race by MSA analysis of ACS PUMS data.

Blacks were always worse off than whites in both the measures of housing and labor market climate and the change in these measures over time. Blacks experienced larger increases in average MSA rents than whites between 2001 and 2005 (20 percent for blacks; 8 percent for whites), and between 2005 and 2009 (14 percent for blacks; 11 percent for whites). Racial disparities in employment status are most stark in 2009, with the black rate roughly 25 percent lower than the rate for whites. The disparity in earnings remains similar in all years. The three indicators of family resources—parents' permanent income, wealth including equity, and the mother's education—also differ significantly between black and white young adults in all four years. The permanent income of black parents is less than half that of whites, and black wealth is only about 10 percent of white wealth, on average. Educational attainment is also significantly higher for the mothers of white young adults compared with their black counterparts.

The racial disparity in the family structure indicator, parents' marital status during the young adult's adolescence, is dramatic. The marriage rate for black parents is less than half that for whites in all years, with the white rate ranging from 79 percent in 2001 to 85 percent in 2009 compared to the black rate of 40 percent and 42 percent in these two years, respectively. Although differences between blacks and whites in most of the remaining attributes shown in Table 1 attain statistical significance, none appears to be substantively meaningful.

Outcome Models

As noted earlier, we tested two different approaches to measuring the housing and labor markets facing young adults. The first assumes that blacks and whites living in the same MSA faced the same housing and labor markets. It computes the means for rent, earnings and employment using time by MSA cells in the PUMS data. The second approach examines whether

blacks and whites operated in different housing or labor markets even if they lived in the same MSA. It computes the means for rent, earnings and employment using time by race by MSA cells.

Table 2 presents the regression coefficients on rent, earnings and employment rates from these two different measurement approaches. These coefficients emerge from modeling the stay-or-leave outcome for black and white young adults separately. Panel A shows the coefficients for the time by MSA housing and labor market measures from base models with no fixed effects and from MSA fixed effects models. Panel B shows the coefficients for the time by race by MSA measures from base models and MSA fixed effects models.

The non-fixed effects and MSA fixed effects models in both panels produce very different results by race. This confirms the need to control for geographic differences using MSA fixed effects. Comparing the results in Panel A to those in Panel B demonstrates a substantial difference between blacks and whites. For white young adults, the regression coefficients do not differ substantially whether rent, earnings and employment are measured using time by MSA measures or time by race by MSA measures. For black young adults, the two approaches to measuring market context yield substantially different results, with the time by race by MSA rent measure significantly associated with household formation. This suggests that black young adults faced strongly segmented housing markets throughout the 2001-2013 period.

Focusing on Panel B, the most striking difference between the base models and the MSA fixed effects models is the change in the result for MSA rent. The base model indicates that rent was a significant deterrent to household formation for both whites and blacks during this time period. Once we include MSA fixed effects, however, rent only plays a role for blacks, not whites. The effect of average MSA rent on black young adults is five time larger than its effect on whites, and the rent coefficient for whites doesn't even approach statistical significance. This result

Table 2: Regression coefficients for housing & labor market characteristics:
Time x MSA vs Time x Race x MSA models

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
A. Time x MSA				
Average YA rent ($1000)	0.177***	0.108^{+}	0.086	-0.140
(Time x MSA)	(0.053)	(0.065)	(0.176)	(0.260)
Average YA earnings ($1000)	0.008	0.004	0.019^{+}	0.014
(Time x MSA)	(0.006)	(0.008)	(0.010)	(0.013)
% YA employed	-0.658**	-0.192	-1.009*	0.070
(Time x MSA)	(0.224)	(0.302)	(0.497)	(0.545)
B. Time x Race x MSA				
Average YA rent ($1000)	0.180***	0.176**	0.086	0.487*
(Time x Race x MSA)	(0.050)	(0.065)	(0.159)	(0.208)
Average YA earnings ($1000)	0.006	-0.005	0.015	-0.006
(Time x Race x MSA)	(0.006)	(0.004)	(0.010)	(0.004)
% YA employed	-0.602*	0.104	-1.006^{+}	0.159
(Time x Race x MSA)	(0.237)	(0.149)	(0.537)	(0.138)

Notes:
1. Outcome = likelihood of living with a parent
2. Regression coefficient, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA rent, earnings and employment based on time by MSA analysis of ACS PUMS data for Panel A (see Appendix Table 1 for full regression results); time by race by MSA analysis of ACS PUMS data for Panel B (see Table 3 for full regression results).
7. % YA employed scale: 0 to 100.

provides strong support for the influence of housing market climate, measured by average MSA rent, on black young adult household formation during this time period. The relationship operates in the expected direction, with living in a more expensive housing market depressing household formation. A $100 increase in rent is associated with nearly a 5 percent decrease in household formation for blacks compared to less than a 1 percent decrease for whites. The $268 dollar increase in average monthly rent experienced by blacks between 2001 and 2009 led to a 13 percent increase in the share of blacks living with parents. In sharp contrast, the $189 increase in rent experienced by white young adults between 2001 and 2013 resulted in only a 1.6 percent decrease in household formation.

By contrast, rent played no role in household formation for white young adults. Instead, whites were much more sensitive to employment opportunities than blacks in forming new households. This shows up most strongly in Panel A, which reports results using the time by MSA market measures. It suggests that whites had relatively unrestricted access to the entire labor market. As shown in Table 1, although the average MSA employment rate for white young adults was always considerably higher than it is for blacks, the white employment rate declined steadily from 2001 to 2013 while the black rate increased between 2009 and 2013. The outcome regressions show that the 4.5 percent decline in the white employment rate between 2001 and 2013 produced an equivalent 4.5 percent increase in the fraction of white young adults remaining at home. The 6 percent decline for blacks over the period led to only a .5 percent increase in living with parents.

Table 3 presents the complete regression results for the models shown in Panel B of Table 2. The first two columns show results from the base models that do not include MSA fixed effects, and the last two columns provide results from MSA fixed effects models. These tables include all

Table 3: Full regression results: Likelihood of living with a parent by time, race and MSA

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
Outcome year = 2001	.108**	.099*	0.058	.143*
	(.036)	(.043)	(.054)	(.055)
Outcome year = 2005	.050^{+}	0.007	0.036	0.032
	(.029)	(.034)	(.030)	-0.04
Outcome year = 2013	.052^{+}	-0.018	.065*	-0.008
	(.030)	(.032)	(.033)	(.039)
Average YA rent ($1000) (time x race x MSA)	0.180***	0.176**	0.086	0.487*
	(0.050)	(0.065)	(0.159)	(0.208)
Average YA earnings ($1000) (time x race x MSA)	0.006	-0.005	0.015	-0.006
	(0.006)	(0.004)	(0.010)	(0.004)
% YA employed (time x race x MSA)	-0.602**	0.104	-1.006^{+}	0.159
	(0.237)	(0.149)	(0.537)	(0.138)
Parents permanent income ($10,000)	-0.005	0.008	-0.006	0.003
	(0.005)	(0.032)	(0.008)	(0.040)
Parents wealth w/equity ($10,000)	-0.008^{+}	-0.013	-0.004	-0.017
	(0.005)	(0.047)	(0.005)	(0.044)
Mother's educ (years)	-0.025***	0.004	-0.025***	0.003
	(0.005)	(0.006)	(0.007)	(0.007)
Parents married (in adol.)	0.019	0.036	0.023	0.038
	(0.027)	(0.027)	(0.031)	(0.030)
YA gender (female)	-0.091***	-0.078***	-0.084***	-0.073**
	(0.020)	(0.024)	(0.024)	(0.026)
YA age	-0.075***	-0.050***	-0.077***	-0.051***
	(0.009)	(0.010)	(0.010)	(0.010)
YA education (years)	0.040***	0.006	0.038***	0.003
	(0.005)	(0.007)	(0.007)	(0.008)
Household size	0.036***	0.023**	0.017	0.023**
	(0.010)	(0.007)	(0.011)	(0.007)

Mother's age	0.005*	0.007***	0.001	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	1.755***	1.095***	2.228***	0.907***
	(0.262)	(0.256)	(0.460)	(0.292)
Observations	2,070	1,761	2,070	1,761
R-squared	0.085	0.040	0.066	0.035
Number of Fixed Effects			220	119

Notes:

1. Regression coefficient, standard error in parentheses.
2. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
3. Samples are not weighted
4. Fixed effects based on MSA location in adolescence
5. Average YA rent, earnings and employment based on time by race by MSA analysis of ACS PUMS data.
6. % YA employed scale: 0 to 100.

of the covariates in the models and are not limited to the housing and labor market contextual measures shown in Table 2. Because the housing and labor market measures account for time, MSA and race, it is challenging to interpret why blacks were significantly more likely to remain at home in the mild recession of 2001 than the GR represented here by 2009, and why whites were more likely to live with parents in 2013 than in the 2009 GR.

These results provide little empirical evidence to support the family investment hypothesis. Two of the measures of family resources, parents' permanent income and parents' wealth. are not statistically significant. The third measure, mother's education, is strongly significant for whites (p <.01). The positive coefficient suggests that a 1-year increase in the mother's education is associated with about a 2.5 percent decrease in the likelihood the white young adult will live with parents, but has no effect on household formation for black young adults.[16] The structure of the family setting during adolescence appears to have had no bearing on the stay-or-leave decision of white and black young adults. This suggests that over a period that included several years of deteriorating economic conditions, young adults' decisions were not influenced by whether they had lived in a 2-parent family during adolescence. As noted in Table 1, the rate of married parents among blacks was less than half that of whites.

The young adult's gender and age are statistically significant for both blacks and whites, and the sizes of the coefficients are similar. Females were more likely to establish their own households, and the older the young adults, the less likely they were to remain at home, with each additional year reducing the likelihood by 5-7 percent. Household size is statistically significant for blacks, with the likelihood of black young adults remaining at home *increasing* as household

[16] To test for possible multicollinearity of mother's education with parental income and wealth, we tested models excluding mother's education. Income and wealth do not become statistically significant when mother's education is excluded (results in technical appendix).

size grew. Each additional household member was associated with a 2 percent increase in the decision to stay than to leave.[17] The young adult's educational attainment is significant for whites but not blacks. For whites, more years of education are associated with a greater likelihood of leaving their parents' home. Other analysis (not shown) indicates that this relationship is not linear. Having some college—those Charles et al. (2015) characterize as "on the margin" between choosing employment versus education—significantly increased the probability that white young adults remained in their parents' home.

Exploring the Household Formation Gap between Blacks and Whites, 2001-2013

The MSA fixed effects models indicate that black and white young adults responded to different influences in deciding whether to form their own household during this volatile period. Blacks were more sensitive to rents than whites, while whites were more sensitive to employment opportunities than blacks even though the average white employment rate was always substantially higher than the rate for blacks over these 13 years. We decompose the variance in the stay-or-leave decision to estimate how much of the difference between black and white young adult household formation in 2001-2013 is explained by differences in the characteristics of the black and white young adult samples (explained variation) and how much is attributable to differences in the relationship of covariates to household formation among whites compared with blacks (unexplained variation). This analysis uses the MSA fixed effects regressions and the time by race by MSA specification of the housing and labor market measures.

[17] The large majority of both blacks and whites in these analysis samples have fewer than five members in their households. Therefore, a larger household size is not necessarily equivalent to a crowded environment.

Table 4: Decomposition, likelihood of living with a parent by race

Overall Decomposition

	Coef.	*p*-value	
White predicted mean	0.345	0.000	***
Black predicted mean	0.483	0.000	***
Difference	-0.138	0.000	***
Explained	0.065	0.410	
Unexplained	-0.202	0.011	**

	Explained			**Unexplained**		
	Coef.	*p*-value		Coef.	*p*-value	
Outcome year = 2001	0.008	0.035	*	-0.019	0.284	
Outcome year = 2005	0.001	0.448		0.001	0.939	
Outcome year = 2013	0.0004	0.825		0.019	0.151	~
Average YA rent	0.068	0.028	*	-0.405	0.167	~
Average YA earnings	-0.021	0.210		0.382	0.062	+
% YA employed	0.025	0.434		-0.847	0.039	*
Parents permanent income	0.002	0.933		-0.012	0.808	
Parents wealth w/equity	-0.007	0.714		0.006	0.788	
Mother's educ (years)	0.003	0.714		-0.379	0.003	**
Parents married (in adol.)	0.015	0.204		-0.012	0.725	
YA gender (female)	-0.001	0.425		-0.006	0.736	
YA age	-0.003	0.211		-0.596	0.055	+
YA education (years)	0.002	0.723		0.463	0.000	**
Household size	-0.007	0.008	**	-0.016	0.653	
Mother's age	0.012	0.003	**	-0.221	0.097	+
Number observations	3,831					
Number white obs	2,070					
Number black obs	1,761					

Notes:
1. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, + p<.10, ~p<.20
2. Decomposition of MSA FE model shown in Table 2.

The two columns in the top panel of Table 4 ("Overall Decomposition") summarize the results. The difference in household formation between races is statistically significant but the explained components, or observables, are not. This suggests that the racial disparity is not driven mainly by differences between the characteristics of the black and white samples.[18] By contrast, the unexplained components, or coefficients on observables, are significant, indicating that the more important source of variation is the way the observables affect household formation between blacks and whites. Both earnings and the employment rate are statistically significant, and average MSA rent is nearly so.

Several demographic characteristics also account for the unexplained variation between black and white household formation. Each additional year of age makes it more likely that a young adult will leave their parental home, but this effect is stronger for whites than blacks. White young adults are more likely to form their own households as their mother's education level increases, but the opposite holds for blacks.

Sensitivity Tests

We conducted four sensitivity tests. First, to test for a possible suppression effect of average MSA rent on the two labor market measures, earnings and employment, we dropped average MSA rent from the model. Both labor market measures remained statistically insignificant (see Appendix Table 2). Second, to test whether the potential endogeneity of the young adult's education affects results, we re-estimated the MSA fixed effects models excluding the education measure. Comparing Appendix Table 3 with Table 2 demonstrates that the results are very similar. Third, Appendix Table 4 presents models that include a dummy variable indicating whether the young adult was in college in the outcome year, along with interactions of this variable with the

[18] The fact that the rent coefficient is statistically significant, however, indicates that blacks and whites experienced different housing markets.

rent, earnings and employment measures. The comparable MSA fixed effects models show that being in college is associated with an increased likelihood of living at home, although this is only statistically significant for black young adults. The inclusion of college attendance does not substantially change the effect of rent on the likelihood of living with a parent, and none of the interaction terms is statistically significant. Finally, because the dependent variable is dichotomous, we re-estimated the models using a logistic regression specification. These results are shown in Appendix Table 5. As already noted, the results of the OLS and the logit models are very similar.

Discussion

This paper uses the PSID to explore young adult decisions to remain in their parents' home or to form their own household during the tumultuous 2001-2013 period. Drawing on theories from an interdisciplinary literature and on empirical research on young adults' living arrangement decisions, we examine two plausible influences: parental resources and the economic context. We find little support for parental resources, the operationalization of the family investment hypothesis posited by Becker and others. Neither parents' permanent income nor wealth were significantly associated with young adult household formation for blacks or whites. But mother's education had a positive effect for whites, with each additional year of a mother's education increasing the likelihood that a white young adult would form a new household.

However, we find strong support for the influence of economic context, with strikingly different results by race. Blacks were sensitive to rents, which increased more dramatically for black young adults over most of the period (from $739 in 2001 to $1,007 in 2009) compared with whites' rents ($923 in 2001; $1,112 in 2013). A 10 percent increase in monthly rent (roughly a $100 increase) was associated with nearly a 5 percent decline in the likelihood that black young

adults would form their own households. The effect of increases in rents for white young adults doesn't even reach 1 percent. That blacks' sensitivity to rent only shows up when we measure rent, earnings and employment rates, our housing and labor measures, by controlling for time, race, and MSA suggests that blacks experienced strongly segmented housing markets throughout this 13-year period. This characterization is supported by other analysis (not shown), which indicates that, in our samples, blacks lived in MSAs with higher median rents than whites. Blacks were also significantly more likely to live in more racially and economically segregated MSAs.

Whites were sensitive to employment rates, which decreased for white young adults over the entire period from 75 percent in 2001 to 70 percent in 2013. The statistical significance of the employment rate was strongest when the economic climate measures control for time and MSA. This suggests that whites had relatively unrestricted access to the entire labor market. A 1 percent decline in the white young adult employment rate produced a 1 percent decrease in the likelihood that white young adults would form their own households.

These findings are consistent with previous research that also indicates that blacks are more likely to live with parents than to form their own households compared to whites (Qian 2012; Settersten & Ray 2010). We expand on this past work in at least three ways. First, in contrast to previous papers that focus solely on the GR, we include the 2001-2013 period. This time frame captures a particularly volatile macroeconomy that some have characterized as the divided decade, from boom to bust. Second, we test MSA fixed effects models to account for geographic heterogeneity. Most previous work does not use fixed effects and the one contribution that does, Matsudaira (2016) relies on state fixed effects, which arguably may be too aggregative to capture housing and labor market differences. Third, we include exogenous measures of the housing and labor market climate faced by young adults during this period by developing measures using the

2000 Census and 2005, 2009 and 2013 ACS PUMS. These measures control for time, race and MSA.

This study provides evidence that, during this volatile period, blacks and whites faced different deterrents to forming their own households. For black young adults, the biggest impediment was rising rents, likely exacerbated by living in segmented housing markets that limit choice. For white young adults, the biggest obstacle was the employment rate. Their unrestricted access to the entire labor market appears to have been more than counterbalanced by the persistent decline in the employment rate. With the continued decline in the unemployment rate since 2013, it is reasonable to speculate that whites are now less constrained in making the stay-or-leave decision. But for black young adults, housing affordability may continue to be a hurdle too high to clear in order to move to independence.

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Appendix Table 1: Full regression results: Likelihood of living with a parent by time and MSA

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
Outcome year = 2001	.104**	0.072	0.046	-0.025
	(.036)	(.045)	(.055)	(.071)
Outcome year = 2005	.051^{+}	-0.001	0.036	-0.027
	(.028)	(.034)	(.031)	(.046)
Outcome year = 2013	.058^{+}	-0.001	.080*	0.018
	(.031)	(.035)	(.034)	(.047)
Average YA rent ($1000) (time x MSA)	0.177***	0.108^{+}	0.086	-0.140
	(0.053)	(0.065)	(0.176)	(0.260)
Average YA earnings ($1000) (time x MSA)	0.008	0.004	0.019^{+}	0.014
	(0.006)	(0.008)	(0.010)	(0.013)
% YA employed (time x MSA)	-0.658**	-0.192	-1.009*	0.070
	(0.224)	(0.302)	(0.497)	(0.545)
Parents permanent income ($10,000)	-0.005	0.011	-0.006	-0.002
	(0.005)	(0.032)	(0.008)	(0.040)
Parents wealth w/equity ($10,000)	-0.007	-0.016	-0.004	-0.014
	(0.005)	(0.046)	(0.005)	(0.047)
Mother's educ (years.)	-0.025***	0.003	-0.025***	0.003
	(0.005)	(0.006)	(0.007)	(0.007)
Parents married (in adol.)	0.020	0.038	0.023	0.042
	(0.027)	(0.027)	(0.030)	(0.030)
YA gender (female)	-0.091***	-0.081***	-0.085***	-0.073**
	(0.020)	(0.024)	(0.025)	(0.026)
YA age	-0.075***	-0.051***	-0.078***	-0.050***
	(0.009)	(0.010)	(0.010)	(0.010)
YA education (years)	0.040***	0.006	0.038***	0.002
	(0.005)	(0.007)	(0.007)	(0.008)
Household size	0.036***	0.022**	0.017	0.023**
	(0.010)	(0.008)	(0.011)	(0.007)

Mother's age	0.005*	0.007***	0.001	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	1.754***	1.187***	2.136***	1.026***
	(0.253)	(0.298)	(0.424)	(0.353)
Observations	2,070	1,761	2,070	1,761
R-squared	0.085	0.039	0.067	0.033
Number of Fixed Effects			220	119

Notes:

1. Outcome = likelihood of living with a parent
2. Regression coefficient, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA rent, earnings and employment based on time by MSA analysis of ACS PUMS.

Appendix Table 2: Regression models excluding average young adult rent

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
Outcome year = 2001	0.061^{+}	0.048	0.043	0.044
	(0.033)	(0.038)	(0.045)	(0.038)
Outcome year = 2005	0.031	-0.012	0.030	-0.006
	(0.028)	(0.033)	(0.027)	(0.038)
Outcome year = 2013	0.071*	-0.018	0.067*	-0.026
	(0.030)	(0.032)	(0.032)	(0.038)
Average YA earnings ($1000) (time x race x MSA)	0.017***	-0.001	0.016	-0.005
	(0.005)	(0.004)	(0.010)	(0.004)
% YA employed (time x race x MSA)	-0.861***	0.145	-1.026^{+}	0.108
	(0.227)	(0.149)	(0.533)	(0.160)
Parents permanent income ($10,000)	-0.002	0.020	-0.006	-0.002
	(0.005)	(0.033)	(0.008)	(0.040)
Parents wealth w/equity ($10,000)	-0.006	-0.007	-0.004	-0.011
	(0.004)	(0.051)	(0.005)	(0.048)
Mother's educ (years.)	-0.023***	0.004	-0.025***	0.003
	(0.005)	(0.006)	(0.007)	(0.007)
Parents married (in adol.)	0.015	0.027	0.023	0.040
	(0.027)	(0.027)	(0.031)	(0.030)
YA gender (female)	-0.091***	-0.081***	-0.084***	-0.072**
	(0.020)	(0.024)	(0.025)	(0.026)
YA age	-0.077***	-0.051***	-0.077***	-0.050***
	(0.009)	(0.010)	(0.010)	(0.010)
YA education (years)	0.041***	0.005	0.038***	0.003
	(0.005)	(0.007)	(0.007)	(0.008)

Household size	0.037***	0.022**	0.017	0.024***
	(0.010)	(0.008)	(0.011)	(0.007)
Mother's age	0.006**	0.007***	0.001	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	1.780***	1.092***	2.255***	1.218***
	(0.255)	(0.256)	(0.433)	(0.246)
Observations	2,070	1,761	2,070	1,761
R-squared	0.078	0.036	0.066	0.032
Number of Fixed Effects			220	119

Notes:
1. Outcome = likelihood of living with a parent
2. Regression coefficient, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA earnings and employment based on time by race by MSA analysis of ACS PUMS.

Appendix Table 3: Regression models by excluding young adult education

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
Outcome year = 2001	0.130***	0.100*	0.079	0.143*
	(0.035)	(0.043)	(0.055)	(0.055)
Outcome year = 2005	0.054^{+}	0.006	0.042	0.032
	(0.029)	(0.034)	(0.031)	(0.040)
Outcome year = 2013	0.045	-0.020	0.064^{+}	-0.009
	(0.030)	(0.032)	(0.034)	(0.038)
Average YA rent ($1000) (time x race x MSA)	0.203***	0.175**	0.127	0.486*
	(0.050)	(0.065)	(0.163)	(0.208)
Average YA earnings ($1000) (time x race x MSA)	0.006	-0.005	0.016	-0.006
	(0.006)	(0.004)	(0.010)	(0.004)
% YA employed (time x race x MSA)	-0.650**	0.103	-1.052^{+}	0.159
	(0.238)	(0.149)	(0.557)	(0.139)
Parents permanent income ($10,000)	-0.005	0.012	-0.006	0.005
	(0.005)	(0.032)	(0.008)	(0.041)
Parents wealth w/equity ($10,000)	-0.008^{+}	-0.012	-0.006	-0.016
	(0.004)	(0.047)	(0.005)	(0.043)
Mother's educ (years)	-0.017***	0.005	-0.018*	0.003
	(0.005)	(0.006)	(0.007)	(0.007)
Parents married (in adol.)	0.036	0.037	0.036	0.038
	(0.027)	(0.027)	(0.030)	(0.030)
YA gender (female)	-0.076***	-0.075**	-0.070**	-0.071**
	(0.020)	(0.024)	(0.025)	(0.025)
YA age	-0.055***	-0.049***	-0.059***	-0.050***
	(0.008)	(0.010)	(0.009)	(0.010)

Household size	0.036***	0.022**	0.018	0.023**
	(0.010)	(0.007)	(0.011)	(0.007)
Mother's age	0.006**	0.007***	0.002	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	1.579***	1.028***	2.083***	0.778**
	(0.258)	(0.255)	(0.462)	(0.301)
Observations	2,070	1,761	2,070	1,761
R-squared	0.063	0.040	0.046	0.035
Number of Fixed Effects			220	119

Notes:
1. Outcome = likelihood of living with a parent
2. Regression coefficient, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA rent, earnings and employment based on time by race by MSA analysis of ACS PUMS.

Appendix Table 4: Regression models including young adult college and interaction terms

	1. Non-Fixed Effects		2. MSA Fixed Effects	
	White	**Black**	**White**	**Black**
Outcome year = 2001	0.101**	0.101*	0.042	0.143*
	(0.035)	(0.043)	(0.053)	(0.055)
Outcome year = 2005	0.041	0.007	0.025	0.031
	(0.029)	(0.034)	(0.031)	(0.040)
Outcome year = 2013	0.055^{+}	-0.017	0.068*	-0.007
	(0.030)	(0.032)	(0.033)	(0.039)
Average YA rent ($1000) (time x race x MSA)	0.179***	0.178**	0.063	0.492**
	(0.053)	(0.068)	(0.162)	(0.210)
Average YA earnings ($1000) (time x race x MSA)	0.006	-0.005	0.016	-0.005
	(0.006)	(0.004)	(0.011)	(0.004)
% YA employed (time x race x MSA)	-0.577*	0.126	-0.944^{+}	0.188
	(0.247)	(0.155)	(0.536)	(0.148)
Currently in School	-0.295	0.399	0.213	0.500*
	(0.601)	(0.267)	(0.629)	(0.215)
In School x Avg YA rent	-0.056	-0.086	-0.108	-0.134
	(0.122)	(0.173)	(0.144)	(0.180)
In School x Avg YA earnings	0.002	-0.004	-0.006	0.001
	(0.015)	(0.014)	(0.018)	(0.013)
In School x % YA employed	0.754	-0.137	0.360	-0.384
	(0.869)	(0.487)	(0.885)	(0.418)
Parents permanent income ($10,000)	-0.004	0.013	-0.005	0.007
	(0.005)	(0.032)	(0.007)	(0.041)
Parents wealth w/equity ($10,000)	-0.008^{+}	-0.015	-0.005	-0.020
	(0.005)	(0.046)	(0.005)	(0.043)

Mother's educ (years)	-0.027***	0.004	-0.028***	0.002
	(0.005)	(0.006)	(0.007)	(0.007)
Parents married (in adol.)	0.020	0.030	0.023	0.033
	(0.027)	(0.027)	(0.031)	(0.030)
YA gender (female)	-0.088***	-0.079***	-0.085***	-0.073**
	(0.020)	(0.024)	(0.024)	(0.026)
YA age	-0.064***	-0.045***	-0.065***	-0.046***
	(0.009)	(0.010)	(0.010)	(0.011)
YA education (years)	0.034***	0.001	0.031***	-0.001
	(0.006)	(0.008)	(0.007)	(0.009)
Household size	0.033***	0.023**	0.016	0.023**
	(0.010)	(0.007)	(0.011)	(0.007)
Mother's age	0.005*	0.007***	0.001	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	1.499***	0.911***	1.981***	0.683**
	(0.265)	(0.258)	(0.460)	(0.310)
Observations	2,070	1,761	2,070	1,761
R-squared	0.102	0.052	0.086	0.047
Number of Fixed Effects			220	119

Notes:
1. Outcome = likelihood of living with a parent
2. Regression coefficient, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA rent, earnings and employment based on time by race by MSA analysis of ACS PUMS.

Appendix Table 5: Logistic regression models: Likelihood of living with parents

	MSA Fixed Effects	
	White	**Black**
Outcome year = 2001	-0.101	-.479**
	(0.204)	(0.185)
Outcome year = 2005	-0.264	-0.629*
	(0.272)	(0.249)
Outcome year = 2013	0.048	-0.687*
	(0.333)	(0.282)
Average YA rent ($1000) (time x race x MSA)	0.532	2.065*
	(0.803)	(0.940)
Average YA earnings ($1000) (time x race x MSA)	0.068	-0.037
	(0.053)	(0.025)
% YA employed (time x race x MSA)	-4.365	0.628
	(2.704)	(0.701)
Parents permanent income ($10,000)	-0.068	0.008
	(0.067)	(0.174)
Parents wealth w/equity ($10,000)	-0.017	-0.068
	(0.063)	(0.262)
Mother's educ (years)	-0.122***	0.011
	(0.035)	(0.031)
Parents married (in adol.)	0.127	0.161
	(0.158)	(0.130)
YA gender (female)	-0.426***	-0.306**
	(0.125)	(0.113)
YA age	-0.373***	-0.213***
	(0.055)	(0.046)
YA education (years)	0.190***	0.011
	(0.037)	(0.035)
Household size	0.083	0.098**
	(0.055)	(0.032)

Mother's age	0.005	0.028***
	(0.011)	(0.007)
Observations	1,930	1,692
Number of Fixed Effects	150	77

Notes:

1. Outcome = likelihood of living with a parent
2. Odds ratio, standard error in parentheses.
3. *p*-values: *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<.10
4. Samples are not weighted
5. Fixed effects based on MSA location in adolescence
6. Average YA rent, earnings and employment based on time by race by MSA analysis of ACS PUMS.