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Keeping up with the Joneses:

Lifestyle Competition and Housing Consumption in the Era of the Housing Price Bubble, 1999-  
2007\*

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## Abstract

Sociologists conceptualize lifestyles as structured hierarchically where people seek to emulate those higher up. Growing income inequality in the U.S. means those at the top bid up the price of valued goods like housing and access to good schools, and those in lower groups have struggled to maintain their relative positions. We examine this process in the context of the U.S. housing market from 1999-2007 using the Panel Study of Income Dynamics. Houses are the ultimate status symbol. Their size, quality, and location signal to others that one has (or has not) arrived. We conduct an analysis of residential moves. As house prices rose, high income households were mostly likely to buy a home and to report upgrading and relocating to more desirable zip codes and large homes. Low income households were frequently restricted to the rental market and most likely to be compelled to downgrade. Across the income distribution, upgrades in terms of home size and zip code desirability came at a significant cost in terms of increased housing expenditures and housing debt relative to income. Households who had children were particularly willing to take on these increases. This evidence suggests that growing inequality meant a struggle to maintain lifestyles during the housing bubble, in particular for the bottom half of the income distribution.

## Introduction

Sociologists have explored the relationship between inequality and lifestyle competition by focusing on consumption (Bourdieu 1984; Sobel 1980; Schor 1998). The basic argument has been that the consumption of goods reflects social status. Since 1980 in the U.S., increasing income inequality has compounded this struggle over lifestyle. Growing income inequality at the top has placed pressures on those below to work to keep up despite stagnant incomes for most households. Households have had to struggle to stay where they are in the status hierarchy and many have fallen behind (Schor 1998; Leicht and Fitzgerald 2006; Frank 2007b).

One of the most acute manifestations of this intensified lifestyle pressure can be seen in the rising costs of housing. House prices increased by almost 100% during 1995-2007 (Shiller, 2008). The U.S. Census Bureau estimated that by 2004, over 40% of households could not afford a home priced in the bottom quartile of the local market where they resided (Savage 2009). Schwartz and Wilson (2008) found that in 2006, 47% of renters and 36% of mortgaged homeowners had monthly housing costs that exceeded the conventional 30% of income cutoff for housing affordability. Most households tried to preserve their style of life by going deeper into debt (Ragan, 2010; Langley, 2008; 2012; Porter, 2012, Cynamon and Fazzari 2009). One of the key areas in which debt grew the most was for housing (Goldstein, 2014).

In this paper we elaborate a lifestyle competition theory of consumption and apply it in order to explain the patterns by which Americans have responded to the twin pressures of rising inequality and the rising housing costs. As the richest people bid up the prices for housing in the most desirable neighborhoods, this forced the households who had income right below them to buy less expensive houses, but at a higher price (Frank 2007a). This competition cascades through the housing market, forcing people lower down to take on more debt or forego buying a

house altogether. The house price bubble of 1995-2007 offers us an opportunity to observe this process in action. We know that households had to learn to be more accepting of going into debt and taking financial risks (Fligstein and Goldstein, 2015; Akerlof and Shiller, 2010) in order to keep up during this time frame.

We use the Panel Study of Income Dynamics (hereafter, PSID) to show how households responded to lifestyle pressures in the housing market. The PSID allows us to determine whether or not households moved in a two year time period and provides information on the housing status of a household (owning or renting) at beginning and end of each time period. The PSID also provides us with information on why people moved. We are able to assess for those who moved whether they thought they were upgrading or downgrading their housing quality. We examine who upgraded (and downgraded) their housing, and to what extent this accounts for changes in the size of the houses people inhabit, the kinds of neighborhoods different people move to, the amount of debt they take on, and the amount of money they expend each month on housing.

Recent work by sociologists and economists has explored the relationship between inequality and housing consumption using cross-sectional data from the Consumer Expenditure Survey (hereafter, CEX) (Charles and Lundy 2012; Bertrand and Morse 2013). We build on these studies in several ways. The CEX contains great detail on how much households spend on a given consumption category, but it does not tell us anything about the nature of the goods they are purchasing. The PSID allows us to analyze the amount people are spending and borrowing for housing as well as the quality of the housing they are consuming (size of the house and neighborhood desirability). The longitudinal structure of PSID allows us to observe individuals across time and space as they move across housing markets. We can draw inferences from the

behavior of the same households over time rather than from cross sectional differences. Finally, we move beyond looking at the average effects of these changes by assessing how house price changes across place affect different parts of the income distributions in different ways.

Not surprisingly, our results show that income is highly related to homeownership. Only 10% of households in the bottom 10% of the income distribution owned homes while 95% in the top 10% of the income distribution owned homes in 2007. During the period 1999-2007, only 27% of the moves made by households in the bottom half of the income distribution were people moving to owning homes while 78% of the moves made by those in the 81-100% of the income distribution were people moving to owning homes. Growing income inequality and rising housing prices meant that the bottom 50% of the income distribution were not able to buy houses and when they moved they were more likely to downsize their housing. The top 50% were more likely to be homebuyers and mostly were trying to upgrading their housing when they moved.

We do find evidence that households at all levels of the income distribution who did move to upgrade their housing did so in order to get more space and be in better neighborhoods. But they also faced going deeper into debt and making larger house payments. Everyone across the income distribution who did “keep up with the Joneses” by upgrading their housing in the face of rising inequality and house prices paid the price to do so. From our perspective, this is evidence that status competition was present across the income distribution.

Our paper has the following structure. We elaborate how status competition works, and how it bears on consumption and debt. Then, we apply this to the case of housing consumption in the U.S. during the 2000s. We discuss the centrality of housing in Americans’ conception of what constitutes a middle class lifestyle and how housing plays a key role in the competition for social status. Next, we consider how rising income inequality has helped push up the prices of

houses during the housing bubble of 1995-2007. We propose some hypotheses about what this implies for housing choices made at varying levels of the income distribution and provide analyses that support these hypotheses. Finally, we conclude by considering how while the striving for a better lifestyle continues, keeping up in the face of growing inequality is hardest for those in the bottom 50% of the income distribution.

### **Theoretical Considerations**

It is useful to elaborate the concept of lifestyle competition. Weber defined social status as a form of community where groups are formed around a specific, positive or negative form of social honor (1946: 186). Status honor is normally expressed by members of a group through the symbolic expression of a style of life. Elias (1994) took up Weber's idea of social status and offered a dynamic view of how status evolves through competitive interactions between groups. Elias argued that a status order was constantly in flux as a result of individual and collective strategies to emulate those above you in the status hierarchy.

Elias elucidates this perspective using the case of early modern European society (1994). The social status of the nobility was a consequence of their claim on social honor due to their privileged birth. In the 16<sup>th</sup> and 17<sup>th</sup> century, they became "civilized" by learning manners, new styles of dress and consumption, and how to make polite and erudite conversation. As capitalism took hold, new social groups began to emerge. These groups did not have noble birth, but some of them, notably the richest merchants, had money. They worked to enter high society by adopting the mannerisms of the nobility. Elias argues that this new rich merchant class had its imitators in social strata just below them. Those with fewer resources worked to create what we

would now call middle class lifestyles. Below them who were less educated and had fewer resources created working class culture but still aspired to have more.

Bourdieu's *Distinction* (1984) built on Elias' analysis by opening up new ground in the empirical study of lifestyle. Lifestyle is conceived of as a set of dispositions that actors have but they are manifested in the kinds of choices people make about how to consume. Bourdieu's theory emphasized that people learn about who they are and what they should expect in life from their class background. He argues that adults construct their lifestyles around two features of their resources: cultural capital and economic capital. They construct their consumption on their basis of their perception of who they are and who they are trying to emulate (or oppose). He uses survey data to provide evidence for these divisions.

Schor pursues the theme of consumption and lifestyle in *The Overspent American* (1998). She follows Elias' and Bourdieu in positing that people strive to compete over status goods. These goods help define peoples' identities and signal to others, their social status. She uses survey data to show how the process of keeping up with others is an arms race where upping the spending ante, forces other to follow. She views the formation of consumer society as at least partially the result of corporations taking advantage of people's tendencies to consume more and more in order to display their social status. Schor's version of lifestyle and consumption focuses on how individuals get caught up in status contests and will go into debt to continue to try and keep up.

Frank (1989; 2007a; 2007b), an economist, has further elaborated a sociological way to understand the relationship between inequality, positional competition and consumption. He agrees with sociologists that status and ranking is important for consumption decisions. He argues that consumption is done in relation to what other people have. When people are given



choices between owning a house that is 4,000 square feet but their neighborhoods have houses averaging 6,000 square feet versus owning a house that is 3,000 square feet but their neighbors average 2,000 square feet, they choose the latter (Frank 2007b). Frank makes the case that the cost of positional goods (a term coined by Hirsch (1979)) can be driven up over time in the face of constant or declining supply, particularly in a context of rising income inequality (2007). This line of work emphasizes how the increasing concentration of income at the top has set off a cascading arms race among everyone else that increases the price they must pay in order to maintain a constant position vis a vis others.

From this literature we can identify two conceptually distinct mechanisms by which lifestyle competition processes will affect consumption, expenditure, and debt. The first is that lifestyle competition changes consumption by shifting what we seek to consume. As those who we seek to emulate or keep up with spend more, we are pushed to spend more as well. Simple versions might involve emulative consumption of the rich, such as the phenomenon of large “McMansions” marketed to middle-class homebuyers during the 1990s and 2000s (Schor 1998; Dwyer 2009). Increasingly lavish consumption at the top may also indirectly fuel higher absolute consumption throughout the distribution by inflating the cultural standards of what is considered relatively normal or even modest for those further below (Levine et al. 2010).

The second mechanism is how prices for valued goods can be bid up as income inequality increases. A greater concentration of income near the top of the distribution will tend to inflate prices for the most desirable goods. Rising inequality can ratchet up individuals’ relative consumption preferences by intensifying demand for scarce positional goods. For example, growing inequality may prompt more parents to seek access to the very best schools by triggering anxiety about class reproduction in an increasing winner-take-all society (Rivera and

Lamont 2012; Frank 2007b). Price cascades are particularly applicable in the case of residential real estate, where increasing prices at the top of the local market will tend to reverberate throughout the market (Matlock and Vigdor 2010). This means that where there is greater income inequality, median housing prices are higher (Levine et al 2010). The implication is that in order to maintain a given lifestyle, people will have no choice but to pay more.<sup>1</sup>

### **Middle Class Aspirations, Housing, Debt, and Inequality**

Homeownership has been the aspirational goal of the middle class in the U.S. since the 1920s (Megbolugbe and Linneman, 1993). It has signified “arriving” at a certain status (Dupuis and Thorns, 2002). Polls have consistently revealed that a middle class lifestyle in the U.S. requires having a house, car, a good job, some wealth, and enough money to pay for one’s children’s college (Schor, 1998: 10-16). Roper Polls have been tracking attitudes towards what constitutes a “good life” in the U.S. since 1975. The leading category for the past 40 years has been homeownership: 85% of Americans in 1975 saw houses as necessary to have a “good life”, 87% in 1991, and 89% in 2001. The second highest category is a happy marriage: 84% saw a good life as a happy marriage in 1975, 77% in 1991, and 75% in 2001. Note that home ownership ranks slightly above having a good marriage for having the good life. Pew Research Center, on the eve of the recent financial crisis, issued a report on the state of middle class America. They report that middle class Americans “regard their home as their most important asset and the anchor of their lifestyle” (2008:33).

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<sup>1</sup> It difficult to measure directly the effect of these two mechanisms. Here, we examine a historical period where we know housing prices were on the rise in order to see how households at different income levels responded. That rise was a result of both of these mechanisms.

From the perspective of lifestyle competition, houses are the ultimate positional good. They are expensive and vary in size, quality of building materials, and locational amenities. Moreover, housing often gives access to good schools for children, another kind of positional good. Evidence shows parents are willing to pay 2.5% more for a house for a 5% increase in test scores (Black, 1999). This is particularly true for the best schools, those in the highest test score brackets (Clapp et al. 2008). The fact that housing is at the core of middle class aspirations and a site where actors seek limited spaces in desirable neighborhoods makes it an ideal site to study lifestyle competition.

The process of status competition during the 2000s must be seen against the backdrop of increases in income inequality have been ongoing since the 1970s (Picketty and Saez, 2003 [2015]). In the face of rising inequality, it follows that the lifestyles of households at any level of that distribution proved more difficult to maintain, particularly relative to those who were situated just above you. As the share of income at the top of the distribution increased, it put pressure on those below to try to keep up (Frank 2007b; Charles and Lundy 2012).

In the past 25 years, the easiest way to close the gap between what you were earning and what you needed to preserve your position was to borrow. This led to a huge expansion of credit that allowed Americans to counter their stagnant incomes and economic insecurity, thereby maintaining their lifestyles and positions in the status hierarchy (Hyman 2011; Erturk, et. al. 2007; Hacker, 2006; Leicht and Fitzgerald, 2006; Rajan 2010; McCloud and Dwyer, 2011). Credit thereby supplied the fuel by which households could engage in aggressive lifestyle competition as prices rose but incomes remained stagnant.

But this expansion of credit did not really level the playing field. If everyone increases their indebtedness, then the status position between groups remains unchanged. Frank (2007b) describes this as a positional arms race that inevitably is won by those with more money. House prices increased in the U.S. between 1996 and their peak in 2005 from an average of \$160,000 to \$230,000 for existing homes and \$140,000 to \$230,000 for new homes (Fligstein and Rucks Ahidiana, forthcoming).<sup>2</sup> As the richest in a particular area bid up the prices for the best houses located near the best schools, people who were competing with them to bid up the prices of the next tier of housing. Worse still, it means that the farther you go down the income distribution, the more likely that households will have to forego buying houses. Rising rents, which track house prices, may also push them into worse neighborhoods.

Aggregate trends and results from several related studies offer suggestive evidence that lifestyle competition for housing has occurred, and that it was driving households to consume more and to take on more debt. In terms of housing size, the U.S. Census Bureau (2011) shows that house size averaged 1,645 feet in 1975, 2,080 in 1990, 2,223 in 2000, and 2,392 in 2010.<sup>3</sup> This process is consistent with a positional arms race where those who are richer want bigger houses and those below them respond by demanding the same. We know that spending on housing as a share of income and as a share of total expenditure increased for both owners and renters during this period. Results from two recent household-level studies using the Consumer Expenditure Survey find that median levels of consumption tend to be higher in cities with higher inequality, controlling for the attributes of households in those cities (Charles and Lundy

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<sup>2</sup> Housing prices dropped dramatically from 2007-2009 but they resumed their upward growth from 2009-2013 and in 2015 are near the levels reached in 2005.

<sup>3</sup> There is a huge literature in marketing and consumption that shows that over time, there has been a ratcheting up of expectations for a wide variety of goods. See Schor (1998) and Zukin and Maguire (2008) for reviews.

2012; Bertrand and Morse 2013). This is consistent with the idea that consumption “trickles down” by ratcheting up standards or by bidding up prices.

We also know the precipitous growth indebtedness during this period was driven almost exclusively by mortgage debt growth (Dynan and Kohn 2007; Goldstein, 2014). Debt-to-income grew across the income distribution, but it grew the most among the upper middle-class households, who are presumably most susceptible to competitive status pressures from those at the top (Goldstein 2012). Fligstein and Goldstein (2015) show that these changes have been accompanied by a shift in cultural attitudes towards whereby taking risk and borrowing money to maintain one’s lifestyle have become more normative. This is particularly true for the top 20% of the income distribution where the direct effects of increasing income inequality are felt most directly. Instead of settling for less, households became comfortable with buying as much house as they could and accepting the higher levels of expenditure, debt, and risk that this entailed.

### **Research Design and Hypotheses**

The rapid house price increases of 1995-2007 offer us a site to observe how rapid price increases in the most important positional lifestyle good impacted households at different parts of the income distribution. Our basic argument is that people higher up in the income distribution will be more likely to upgrade their housing than people lower down in the face of rising house prices and thus “keep up with the Joneses”. Those lower down will face pressure either to forego the opportunity to buy in the first place, move to a cheaper rental, or be forced to sell their homes. They will be more likely to experience downward mobility in consumption status in the face of lifestyle competition pressures.

Measuring the effect of income inequality and rising house prices on the ability of households to upgrade or downgrade their housing in order to keep their position in the status queue needs unpacking. Our argument can be taken to imply that households are always cognizant of their status and status concerns are always factoring into their behavior. But in reality, moving reflects not just status competition but a whole host of unrelated factors. People who already own homes may have the view that they already have arrived and will thus be disinterested in moving. People buy and sell houses not just for status, but also for changes in their life circumstances like new jobs or retiring. The difficulty in figuring out how households are responding to changing housing markets and increasing income inequality is to separate out aspects of moves that reflect status competition from those that reflect changing social circumstances.

Our research design solves some of these problems by simplifying our analysis and making it more tractable. We take the move as our unit of analysis, which means that we only study households who move during the two year period between interviews. This strategy follows from the fact that we are less interested in the factors that prompt households to move or stay *per se*. Rather, we want to understand when households do move, how do those in different parts of the income distribution differentially change their housing consumption (size and neighborhood desirability), housing expenditures, and housing debt? Since we have data on why households say that they move, we can directly model who is moving to upgrade their circumstances, who is moving to downgrade their housing, and who is moving for other unrelated reasons such as taking a new job in a different metropolitan area. Our argument about the effect of rising house prices and rising inequality on the decision to upgrade or downgrade housing implies the following hypothesis:

Hypothesis 1: Movers in the top part of the income distribution will be more likely to report they are moving to upgrade their housing than movers in the bottom part of the income distribution. Conversely, those who report they are moving to downgrade their housing will disproportionately be households in the bottom part of the income distribution.

A potential confounding factor in the decision to try and upgrade or downgrade housing is the household's previous tenure status. For example, households who already own a home and are considering buying a new one are in a different financial position than renters seeking to purchase a home. Thus we stratify our analysis to compare people who start with a similar housing status. We classify moves into four categories: households who go from owning a house to buying a new house (own to own), those who own a house and then sell it (own to not own), those who are renters and buy a house (not own to own), and those who are renters who move to another home they do not own (not own to not own)..

The decision to upgrade housing is made easier for households who already own their homes. They have equity in their existing homes and find it easier to take on larger mortgages as a trade-off for more space and better houses. Of course, higher income households were more likely to be homeowners at the start of the housing boom. But even within the population of homeowners, we expect to see differences across income groups, such that higher income households will be more apt and able than lower income households to upgrade when they move. On the other side, some households will have to downsize because of financial stress caused by divorce, losing a job, or illness. We expect that low income owners should be more likely to have fewer resources to withstand such a downturn and be more likely to downgrade.

Hypothesis 2: Low income households who own homes will be less likely to upgrade their houses than high income households. Low income households will be more likely to downgrade their homes even when they own their homes.

Renters who want to own homes face a different challenge. First time homebuyers need to come up with a down payment and support a mortgage. It is these buyers who we believe had

to stretch the most by going deepest into debt to meet their aspirations. We expect that lower income households will be less likely to upgrade to a house as a result. Households who were renters faced rising rents as house prices took off. These households had to pay those rents to maintain their lifestyles or move to cheaper neighborhoods. We expect that lower income households will be more likely to report moving to downgrade their housing.

Hypothesis 3: Low income households who were renters will be less likely to upgrade their housing at all and more likely to downgrade their housing when continuing to rent than high income renters.

In addition to the reported reason people move, we are interested in the objective changes that resulted from moves. The outcomes we focus on changes in the sizes of their homes, the status of their neighborhoods, their housing expenditures as a percentage of total income, and their debt as a percentage of total income. The first two correspond to the lifestyle goods over which households are competing while the latter two correspond to the financial consequences of this consumption.<sup>4</sup> If housing is a locus of lifestyle competition, we expect households will increase their share of expenditures on housing and their debt loads in order to attain larger homes or more desirable (i.e. expensive) neighborhoods. Our causal argument is that the main mechanism by which income level affects these outcomes is through the decision to upgrade or downgrade housing. Since higher income households are more likely to upgrade than downgrade their housing circumstances, we expect that income differences will disappear when we include a measure for whether or not households are upgrading or downgrading their housing.

This produces the following hypotheses:

Hypothesis 4: We expect households that already own homes and say they are upgrading will buy larger houses in more expensive zip codes and increase their housing debt and housing

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<sup>4</sup> Of course some of these outcomes are only applicable to certain types of moves. If people decide to buy a house for the first time, then almost by definition they will be increasing their housing debt; if they move from owning a house to a rental, they will certainly have less debt. Rent-to-rent movers will not accrue additional housing debt.



expenditures. We expect that this tendency to upgrade will be most pronounced among upper-middle income households who are facing the greatest competitive pressures to enhance their lifestyle.

Hypothesis 5: We expect that renters who report moving to upgrade their housing will see greater increases in space and higher housing expenses than renters who report moving for other reasons.

Hypothesis 6: We expect households who are married and have school-age children to undertake moves into larger houses and higher-priced zip codes than those without children. We expect that they will have greater increases in housing expenses and debt when they move compared to movers without school-age children.

## **Data and Methods**

We use the Panel Study of Income Dynamics (PSID), a nationally representative longitudinal survey of U.S. households. By using longitudinal data, we are able to observe the households both before and after they move. We take advantage of the PSID Consumption Expenditure Data Files that began in 1999 which allows us to measure expenditures in more detail.<sup>5</sup> We begin our analysis in 1999 because of these files and end with the 2007 wave to capture the full extent of the housing bubble (i.e., the high peak of house prices in 2005 and their slight decrease between 2005 and 2007) but little of the Great Recession that followed it. During this time in-person surveys with households were conducted every other year, so we have five waves of survey data and four possible moves per household. Restricted access geo-located data were obtained from the Institute for Social Research at the University of Michigan, with which we matched households to the local housing markets in which they reside at the zip code level.

Respondents reported whether they had moved in the past two years since the last survey. Based on the homeownership status of households before and after the moves, we code

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<sup>5</sup> These files and documentation are available at <http://simba.isr.umich.edu/Zips/zipSupp.aspx#CONEX>

households in each wave who move to one of four categories: (owner to owner, non-owner to owner, owner to non-owner, non-owner to non-owner).<sup>6</sup> For each move, the respondent was asked why the household moved, which was then coded into 8 categories. We recode these reasons into three types: Upgrades were moves coded as “expansion of housing: more space; better place”, “want to own home”, or “better neighborhood; to be closer to friends and/or relatives.” Downgrades were moves coded as “contraction of housing: less space; less rent” or “Response to outside events (involuntary reasons): housing unit coming down; being evicted; armed services, divorce, and health”. Other Moves were those coded as “to take another job; transfer; stopped going to school”, “To get closer to work”, or “Ambiguous or mixed reasons: all my old neighbors moved away; retiring.”

Our other outcomes of interest are the changes in the sizes of the houses, the desirability of the neighborhoods, and the amount of money they expend and debt they have. We created the following variables in order to measure these: the change in the self-reported number of rooms, the change in the median housing price in a respondent’s zip code (which we report in \$10,000s) obtained from Zillow, the change in the ratio of annual housing expenditures to annual household income, and the ratio of total housing debt (all mortgages, including home equity loans) to annual household income. Housing expenditures include monthly mortgage payments, rent, insurance, property tax, and utilities. The PSID’s housing and total expenditure figures closely match those in the Consumer Expenditure Survey (Li et al. 2010). For income we use total family income before taxes (post-income tax data is not available).

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<sup>6</sup> We sometimes refer to non-owners as “renters.” Based on the expenditure data, we know that a very small portion of non-owners also do not report rent payments. Removing these cases does not alter our findings.

Area housing prices are based on annual, inflation adjusted estimates of the median price for all owner-occupied homes in a given zip code. These data come from Zillow (Zillow Real Estate Research, 2014). Zillow's database offers the only publicly-available source of annual, zip-code level housing prices across a large swathe of the U.S. Other commonly used housing price datasets such as the Federal Housing Finance Authority OFHEO index and the S&P Case-Shiller index only produce estimates at the MSA Level, and in the latter case, only cover 20 MSAs.<sup>7</sup> The main drawback of the Zillow database is its poor coverage in rural areas with small and/or illiquid housing markets. Specifically, data is available for zip codes in 885 counties across the full period from 1999-2007. Those PSID respondents who reside outside these counties are effectively excluded from the parts of our analysis that uses zip code prices. Using data from the American Community Survey, we calculated that the Zillow-covered areas contain 77% of all U.S. households in 2007, but 87% of households who reside in areas within a metropolitan statistical area (defined as a labor market area with a total population in excess of 50,000). The covered areas furthermore contain over 90% of all households within the 175 largest metropolitan areas (MSAs with population greater than ~250,000 in 2007).<sup>8</sup>

We are also interested in how these effects vary across the income distribution. Given the limited number of moves in our analyses, we found that using a large number of income groups (e.g., income deciles or quintiles) was not useful. Instead, when analyzing homeowners, we

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<sup>7</sup> Zillow's median price estimates are constructed from an underlying proprietary database of property value imputations. Zillow's published indices for geographic areas differ from repeat-sales indices such as Case-Shiller insofar as Zillow's is designed to account for changes in the composition of housing stock in a given area, whereas Case-Shiller holds the mix of housing stock constant. In practice, however, the Zillow and Case-Shiller indices closely track one another during the period from 1999 to 2009 (Bruce 2014).

<sup>8</sup> To explore the possible bias introduced by this, we examined a set of several population-weighted mean characteristics of Zillow-covered counties to all counties in MSAs in 2005. We found that the covered areas closely match the characteristics of the overall metropolitan population across median age of the head of household, percent minority, income per capita, unemployment rate, and new residential building permits per existing housing units. Results available upon request.

opted for a three-category income measure (based on the two-wave average of the income before and the income after the move): the 1<sup>st</sup>-50<sup>th</sup> percentiles, the 51<sup>st</sup>-80<sup>th</sup> percentiles, and the 81<sup>st</sup>-99<sup>th</sup> percentiles. This categorization roughly places into each category an equal number of moves among homeowners.<sup>9</sup>

We control for a number of additional variables in our models: household size (1, 2, 3, 4 or 5+ members), and, as reported for the household head: age, age-squared (divided by 100 to scale the coefficient), race (1 = non-white, 0 = white), sex (1 = female, 0 = male), and marital status (1 = married, 0 otherwise). Each of these variables is coded based on the values from the wave after the move (but results were similar using the values from wave before the move).

We use logistic regression for our models that explain the determinants of upgrading or downgrading. For our other measures we use OLS regression models. All models account for sampling weights and standard errors are clustered by household, since households may appear more than once in the analysis by moving multiple times. We limit our analysis to households where the head of household was between ages 25 and 65. All dollar values are adjusted with the CPI-U-RS series to 2007 dollars (the last year of our analysis). We remove from the analysis the households reporting values above the 99th percentile or below the 1st percentile of each outcome variable to avoid unduly influential observations.

## Results

(Figure 1 about here)

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<sup>9</sup> We explored different cut-offs between the income groups and found our results were not highly sensitive to this choice. We also redid the analysis using a four-category income measure and found substantively similar results. We prefer the three-category measure for parsimony.

Panel A of Figure 1 shows that homeownership is highly related to income. The top 20% of the income distribution has ownership rates above 90% while the bottom 20% has ownership rates less than 20%. During the housing bubble, homeownership rates increased across the income distribution. But rates increased the most for those above the 50<sup>th</sup> percentile of the income distribution. This is evidence that as house prices took off, the bottom half of the income distribution still found it relatively more difficult to purchase a house despite the well-documented widening availability of mortgage credit during the 2000s. Panel B of Figure 1 shows how mean debt for homeowners changed across the years. Low income households are deeper in debt when they own housing than high income households in all of the panels. But, over time indebtedness increases for nearly all income groups in the data who own homes. This is evidence households at all income levels displayed growing willingness to take on debt as house prices were rapidly increasing. But, as noted above, those in the bottom half of the income distribution were either less able or less willing to compete in the increasingly expensive home-buying market. Those in the top half increased their homeownership rates, but at the cost of going deeper into debt.

At the core of our analysis is the attempt to examine how various income groups changed their housing status across the 4 panels and whether or not they upgraded or downgraded housing as housing costs increased. Table 1 presents descriptive statistics for the PSID. There were 5862 moves during the period. Upgrades make up 48% of these moves, downgrades are 18%, and other reasons make up the remaining 34%. The percentage of moves in each two-year period increased from 19% in 1999-2001 to 29% in 2005-2007. One notable finding is that even as prices were rising for housing, nearly half of the moves were made to upgrade housing, and as the bubble grew more and more households felt compelled to move. Table 1 shows that 46% of

the moves were for households going from one rental to another. Only 17% of the moves reflected households moving from renting a home to buying one. 27% of the moves were for owners who then moved on to own a new house, while 10% were owners who sold their homes to become renters.

(Table 1 here)

Figure 2 breaks out the types of moves by income groups. Here, one can see the income effects on housing quite clearly. Around 65% of all moves by the bottom 50% of the income distribution were for people moving from one rental to another. For the top income group, nearly 65% of the moves were for people who were moving from owning one house to owning another. If one includes the people who went from being renters to owners in this total, nearly 80% of the moves for the top income group were for people who ended up owning homes. Conversely, only about 30% of all moves for people in the bottom 50% of the income distribution ended up with people owning homes. These differences are highly statistically significant using a chi-squared test.

(Figure 2 about here)

Panel A of Figure 3 shows the percent of total moves within each income group that were upgrades, downgrades, or other across housing transition types. High income moves were predominantly for upgrading housing in the largest categories of people moving from ownership to ownership or moving from not owning to owning. Low income moves were less likely to be upward in these categories. About 20% of the total moves by low income households were downgrades while less than 10% of high income households undertook downgrades. This is consistent with hypothesis 1. Notably, low income renters were still more likely to upgrade than

downgrade suggesting that they were striving to get better housing even as rents and house prices were going up. This is contrary to hypothesis 3. The middle income group was most likely to moves from not owning a house to owning a house. This is evidence that middle class earners who were renters were buying homes even as prices were rising and were the ones who experienced the most upward housing mobility.

(Figure 3 about here)

Panel B of Figure 3 presents data that shows the percentages within housing transition categories. Within each move type, the different income groups evidenced more or less the same likelihood to upgrading or downgrading. Most households who moved from owning one house to another reported upgrading, and this was true across income groups. Meanwhile, for many households, becoming a homeowner is an upgrade unto itself. Of all moves, 17% were from being non-homeowners to homeowners. Of those, approximately 75% were reported as upgrades across the income distribution. Less than 6% called the move a downgrade. On the other hand, homeownership can also be precarious as unemployment or other financial hardships undermine households' ability to maintain mortgage payments. Ten percent of all moves are from owning to not owning. Not surprisingly, few who transitioned from owning to renting reported this move as an upgrade; most often it was for "other reasons".

Altogether, we take the relative invariance across income groups in Panel B as suggesting that conditional on being in a given move category, all households were equally likely to seek to upgrade their housing situation even as house prices and rents were increasing. This is evidence that at every level of income, households wanted to "keep up with the Joneses".

The descriptive results are broadly consistent with our overarching story. Higher income groups did upgrade more often and were more likely to move from ownership to ownership. But even in an era of rising housing costs, the plurality of moves across the income distribution involved upgrades in housing consumption. Not surprisingly, lower income households were more likely to be shut out of homeownership. But conditional on transitioning to homeownership, lower-income households upgraded at equal rates as higher income households.

Table 2 models the determinants of whether moves are upgrades or downgrades. The first two models of the table model upward and downward moves for all moves. The baseline income group is those in the 81-100<sup>th</sup> percentiles. Here, we see clearly that lower income groups are less likely to upgrade their housing and more likely to downgrade their housing. Married households and larger size households are more likely to upgrade than unmarried individuals or female headed households and households with fewer members. This provides support for hypothesis 1. These results are the same for households who start out owning a home (models 3-4) and for those who start out renting (models 5-6). This provides support for hypotheses 2 and 3.

(Table 2 about here)

Table 3 considers the determinants of changes in house size and median zip code prices for movers who are repeat homebuyers. Models 1 and 3 show that respondent's reported reasons to move (e.g., to upgrade or downgrade) were reflected in their choice of housing size and neighborhood costs. Households who reported upgrading also reported increasing their house size by over a half a room and moved into neighborhoods where house were almost \$30,000 more expensive. This is evidence for the first part of hypothesis 4. Models 2 and 4 examine the interaction between income and upgrading in order to evaluate if upgrading results in larger



changes in house size and median price for high-income households than low income households. While there is some interaction between upgrading and income, the total effects are not large. This implies that the main mechanism by which higher income effects housing consumption is through the ability to upgrade housing by buying a bigger house in a more expensive neighborhood. There are also no direct effects for being married or family size on moving to a larger house in a better neighborhood. But there was evidence (Table 2) that being married and having more family members was a determinant of upgrading housing. This provides partial support for hypothesis 6 at least for those who could upgrade.

(Table 3 about here)

Table 4 models the changes in the ratio of housing expenditures to income (hereafter, “housing expenditures”). In model 1 we examine the relationship between housing expenditures and type of move. Upgrades do appear to add changes to housing expenditures. An upgrade implies an additional 7 percentage point increase in the portion of one’s income spent on housing compared to downgrades. We calculated the predicted changes for each reason for move, holding other covariates at their means. We found that an average moves result in a 9 percentage point increase in housing expenditures for upgrades, a 6 percentage point increase for other moves, and a 2 percentage point increase for downgrades. Notably, repeat buyers who downgrade do not reduce their housing expenditure to income. Low income groups increased their housing expenditures slightly more than higher-income groups when they moved. We also find that married households increased their housing expenditures significantly more than single families in moves. This is consistent with hypothesis 4.

(Table 4 about here)

In model 2, we add interaction terms between each income group and type of move to see if the differences between upgrading and downgrading are different for each income group. However, we find no significant differences. Here, we do observe any relationship. In models 3 through 6 of Table 4 we examine the relationship between housing expenditures and some of the dimensions along with households can upgrade or downgrade. Models 3-4 examine changes in home size. Each room increase (decrease) is associated with a 1.6 percentage point increase (decrease) in housing expenditures in model 3. Model 4 includes interaction terms between change in house size and income group. Low income households appear to increase their expenditures slightly more for each additional room increase. Models 5-6 examine changes in median zip code housing prices, but there is also no effect of changing zip codes on housing expenditures (models 5-6).

Table 5 presents results for the change in the ratio of mortgage debt to annual income (hereafter, "housing debt"). Table 5 presents the same covariates as Table 4, but with housing debt as the dependent variable. Model 1 shows that upgrades in housing result in significantly more housing debt than downgrades and other moves. When we add interactions in model 2 between income and upgrades, we find no statistically significant interaction effects. Model 3 provides evidence that larger houses do raise housing debt. When we add interactions terms with income (model 4), we find, that the effect of moving to a larger home on housing debt is smallest for the highest earning households and largest for the lowest earning households. Model 5 shows us that there is a significant effect of changes in median zip code prices on housing debt. A \$10,000 increase (decrease) in the median zip code is associated with a 2 percent increase (decrease) in the ratio of housing debt to income. Model 6 shows an interaction between change

in home size and change in median zip code price that was small and not statistically significant. Again, this is evidence to support hypothesis 4.

Taken together, these results suggest that the main way that income effects changes in house size, zip code desirability, house expenditures, and indebtedness among repeat homebuyers is the decision to upgrade their housing. The highest income households who already own their housing are the most likely to be able to upgrade while the lowest income households the least able to upgrade. We have evidence that married households and households with children are more likely to upgrade while single households and households headed by women are less likely to upgrade. The fact that upgrades tend to result in an increased share of expenditure on housing suggests that those who opt to compete aggressively in the lifestyle competition by upgrading are stretching further financially to keep up with the Jones'.

(Table 5 about here)

We next turn to moves within the rental market. Non-own to non-own moves make up 49% of all the moves in our data. Of these moves, households described 38% as upgrades, 22% as downgrades, and 40% as other moves. However, the vast majority of these moves (86%) are by movers in the bottom half of the income distribution. For this reason, in our analyses of non-homeowners, we combine the middle and upper class households above the 50<sup>th</sup> percentile of the income distribution. Table 6 models changes in home size and location price. In Model 1, we find that upward moves do result in larger homes ( $b = 0.65$ ,  $p < .001$ ) supporting hypothesis 5. There are several other significant effects. Female headed households tend to move to larger houses and increases in family size also are related to having a larger house. Model 2 introduces interactions between income group and type of move. None of these interactions are significant.

Both gender of household head and the presence of additional family members remain significant. Models 3 and 4 show how quality of area is associated with moves. Again, our analysis here is restricted to only moves that involve a change in zip code for which we have median price data on both zip codes. None of the coefficients is statistically significant. This implies that renters, even those who are upgrading are either not inclined to move to more wealthy areas, or more likely, the availability of rental housing is restricted in such areas. This suggests this part of hypothesis 5 is wrong.

(Table 6 about here)

Table 7 considers how changing locations affects renters housing expenditures (renters do not have mortgages so their change of moves cannot affect housing debt). Model 1 shows that upgrading housing for renters has a statistically significant effect on their expenditures. There is also a small effect for moving for other reasons on expenditures as well. The main other variable that is statistically significant is nonwhite status. Here, nonwhites increase their housing expenditures less than whites when they move. In Model 2, we add interaction terms between each income group and type of move. The main effect of upgrading on changes in housing expenditure appears to be for people in the bottom 50% of the income distribution. This is consistent with hypothesis 5. The opportunity to upgrade housing for the bottom half of the income distribution may not include buying a house. But if such households can afford to upgrade, they will take on higher monthly expenditures on housing than higher income households.

(Table 7 about here)

Models 3-4 examine the effect of changing home size on housing expenditures. These models show that getting a bigger house increases housing expenditures and does so in particular for lower income households. Models 5-6 examine the link between moving to a higher priced zip code on housing expenditures for renters. There is no main effect on such moves on housing costs. But, there is an interaction with income group again. Here, renters in the bottom 50% who move to higher income neighborhoods have higher changes in housing expenditures than higher income households.

Upgrading non-owners moved to larger houses but not necessarily in nicer neighborhoods (at least as measured by median home prices). They also increased their housing expenses when they upgraded. There is also evidence that renters were responding as much to pressures from family size when they moved as they tended to move to larger and more expensive housing as family size grew.

### **Discussion and Conclusions**

There are two interesting stories about status competition in our data analysis. The first story is that income was a highly salient factor in determining whether or not households were able to respond to lifestyle pressures by making moves that upgraded their housing situations in the housing bubble between 1999 and 2007. Not surprisingly, households in the top 20% of the income distribution were the most likely to upgrade while households in the bottom 50% were the most likely to downgrade. But, equally interesting is the evidence that movers throughout the income distribution did try to upgrade their housing situations even as prices inflated through the period. Low income groups who already owned homes and bought new ones were as likely to upgrade as high income homeowners. Similarly, low income households who managed to move

from renters to owners upgraded their housing at a same rate as high income households. About 60% of the moves that renters made (over 80% of whom were in the bottom 50% of the income distribution) were to upgrade housing. Low income renters did not show a tendency to downgrade housing at a higher rate than high income renters implying that they too were trying to keep up with the Joneses.

Our findings suggest that one way to think about the link between stratification and housing consumption is that there are three large income groups each of which is affected by rising house prices in different ways. People in the bottom 50% of the income distribution were least likely to buy homes and most likely to move as renters. Although lower-income movers were engaged in the struggle to enhance their housing consumption, they were largely consigned to doing so in the rental market. When they did buy, those in the bottom 50% went the most deeply into debt relative to income of any group, suggesting that homeownership came at the cost of considerable debt for those lower in the socio-economic hierarchy.. They tended to buy those houses in less expensive zip codes and opted for larger houses. Middle and upper middle class income groups (51<sup>st</sup> -100<sup>th</sup> percentiles) faced a different kind of pressure. They were able to buy and own houses at much high rates. But, they too had to devote more of their expenditure to housing and go ever deeper into debt to do so.

Our results imply several lines of additional research. First, we think that the role of children and schools in maintaining lifestyles bears further scrutiny. We have evidence that family size was a predictor of housing upgrades net of income. It would be interesting to try and explore whether or not such moves were to enter better school districts. One tactic could be to incorporate data on school quality directly in order to see if households with children paid more money for better schools. However, this data is complex to gather. For example, some school

districts are quite large (like in Los Angeles) and any measure of school quality is likely to mask differences in house price increases for movers related to school quality. Moreover, many parents at the top of the income distribution put their children into private schools.

Second, sociologists have been slow to unpack the linkages between income inequality, indebtedness, housing, and place, for the social position of households. Our results, while complex, show how place and housing play a big role in the social status of households. Housing, place, and debt are not usually considered as stratification variables, but we have shown how they play an important role in household's social status and life styles.

Subsequent research should recognize that increasing income inequality affects households quite differently given where they are placed on the income distribution. Our results support a sociological view of how growing income inequality dramatically affected household's ability to attain a middle class lifestyle during a time of rapid house price increases. Households responded to those at the top bidding up house prices by taking on debt and increased monthly expenditures to buy the best house they could. This created not only a middle class squeeze, but an even more pronounced upper middle class squeeze. Life for households in the bottom 50% of the income distribution became even harder as the ultimate status symbol of a middle class lifestyle, owning a home, was difficult to attain and when purchased pushed households to the highest levels of indebtedness.

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Table 1: Descriptive Statistics

	mean	sd	min	max
Change in housing expenditure to income ratio	0.058	0.31	-1.53	1.91
Change in housing debt to income ratio	0.28	1.07	-3.21	4.50
Change in number of rooms	0.33	1.98	-5	5
Change in median zip code price (\$10000s)	0.14	4.63	-15.4	15.1
Upgrade reason for move	0.48		0	1
Downgrade reason for move	0.18		0	1
Other reason for move	0.34		0	1
Owner -> Owner	0.27		0	1
Non-owner -> Owner	0.17		0	1
Owner -> Non-owner	0.099		0	1
Non-owner -> Non-owner	0.46		0	1
Nonwhite	0.25		0	1
Married	0.43		0	1
Female	0.71		0	1
Age	40.8	10.1	26	65
Age squared/100	17.7	8.78	6.76	42.2
Family Size: 1	0.36		0	1
Family Size: 2	0.24		0	1
Family Size: 3	0.15		0	1
Family Size: 4	0.15		0	1
Family Size: 5+	0.10		0	1
Year 2001	0.19		0	1
Year 2003	0.25		0	1
Year 2005	0.26		0	1
Year 2007	0.29		0	1
<i>N</i>	5862			

Table 2: Logistic regression models of reason of move (coefficients are log-odds) (Baseline income group is p81+). The dependent variable is at the top of each model: Models 1 and 2 are all moves; Models 3 and 4 are moves for people who owned a home *before* the move (Own -> Own and Own -> Not Own); Models 5 and 6 are moves for people who did not own a home before the move (Not Own -> Not Own and Not Own -> Own).

	(1) Upgrade	(2) Downgrade	(3) Upgrade	(4) Downgrade	(5) Upgrade	(6) Downgrade
main						
p1-p50	-0.33**	0.49**	-0.65**	0.87*	-0.35*	0.49*
p51-p80	-0.057	0.22	-0.20	0.51	-0.20	0.25
Nonwhite	0.063	0.11	-0.022	0.19	0.20	-0.064
Married	0.54***	-0.47**	0.59***	-0.25	0.70**	-1.07***
Female	-0.36***	0.028	-0.23 <sup>+</sup>	-0.18	-0.84***	0.59*
Age	-0.12***	0.075 <sup>+</sup>	-0.091*	0.045	-0.21***	0.15*
Age squared/100	0.12**	-0.060	0.093 <sup>+</sup>	-0.032	0.20**	-0.14
Family Size: 2	0.072	-0.018	0.12	-0.17	-0.027	0.32
Family Size: 3	0.37**	-0.057	0.50**	-0.29	0.16	0.39
Family Size: 4	0.30*	-0.22	0.25	-0.13	0.31	-0.23
Family Size: 5+	0.56***	-0.34 <sup>+</sup>	0.74***	-0.45*	0.29	-0.11
Year=2003	0.34**	0.70***	0.22	0.65**	0.55**	0.85**
Year=2005	0.25*	-0.22	0.15	-0.34	0.46**	-0.026
Year=2007	0.85***	0.91***	0.80***	1.04***	1.01***	0.68**
Constant	2.49***	-4.19***	1.98*	-3.79**	4.58***	-6.15***
Observations	5273	5273	3514	3514	1759	1759

<sup>+</sup>  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 3: Models Predicting Changes in Home Size and Median Zip Code Prices, Repeat Homebuyers Only. (Baseline move reason is “Upgrade”; baseline income group is “p81+”)

	(1) Change in Home Size	(2) Change in Home Size	(3) Change in Median Zip Code Price	(4) Change in Median Zip Code Price
Upgrade	0.63**	1.34***	2.78*	1.11
Other	0.34	1.25**	1.33	1.58
p1-p50	-0.095	1.06*	-0.75	-3.00
p51-p80	-0.14	0.64	0.10	-0.60
Upgrade x p1-p50		-1.29*		3.49
Upgrade x p51-p80		-0.70		2.11
Other x p1-p50		-1.36*		1.19
Other x p51-p80		-1.18*		-1.51
Nonwhite	0.10	0.077	2.29**	2.12*
Married	0.46 <sup>+</sup>	0.42	-2.14 <sup>+</sup>	-2.20 <sup>+</sup>
Female	-0.42	-0.39	0.19	-0.14
Age	-0.038	-0.040	-0.082	-0.15
Age squared/100	0.023	0.024	0.070	0.13
Family Size: 2	-0.15	-0.12	0.69	0.96
Family Size: 3	0.24	0.26	0.059	0.37
Family Size: 4	0.54	0.56 <sup>+</sup>	1.87	2.00
Family Size: 5+	0.54	0.58 <sup>+</sup>	0.66	0.86
Year=2003	-0.30	-0.27	-1.32	-1.34
Year=2005	-0.29	-0.30	-0.45	-0.59
Year=2007	-0.34 <sup>+</sup>	-0.33 <sup>+</sup>	-1.09	-1.15
Constant	1.34	0.67	2.37	4.99
Observations	1220	1220	413	413
R <sup>2</sup>	0.084	0.095	0.072	0.087

<sup>+</sup>  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 4: Models Predicting Changes in Housing Expenditures, Repeat Homebuyers Only. (Baseline move reason is “Downgrade”; baseline income group is “p81+”)

	(1)	(2)	(3)	(4)	(5)	(6)
	Change in housing expenditures to income	Change in housing expenditures to income	Change in housing expenditures to income	Change in housing expenditures to income	Change in housing expenditures to income	Change in housing expenditures to income
Upgrade	0.065*	0.045				
Other	0.037	0.020				
p1-p50	0.040 <sup>+</sup>	0.0040	0.031	0.021	0.056	0.058
p51-p80	0.0069	-0.00029	-0.0016	-0.0079	-0.0016	-0.00080
Upgrade x p1-p50		0.057				
Upgrade x p51-p80		0.00089				
Other x p1-p50		0.014				
Other x p51-p80		0.024				
Change in Home Size			0.016***	0.0064		
p1-p50 x Change in Home Size				0.020 <sup>+</sup>		
p51-p80 x Change in Home Size				0.0099		
Change in Median Zip Code Price					0.0023	0.0032
p1-p50 x Change in Median Zip Code Price						-0.0029
p51-p80 x Change in Median Zip Code Price						-0.0012
Nonwhite	0.035	0.036	0.031	0.033	0.062	0.062
Married	0.093*	0.094*	0.084*	0.086*	0.15**	0.15**
Female	-0.022	-0.021	-0.038	-0.040	-0.17*	-0.17*
Age	0.0034	0.0029	0.0036	0.0031	-0.0041	-0.0041
Age squared/100	-0.0028	-0.0021	-0.0028	-0.0023	0.0051	0.0051
Family Size: 2	-0.068	-0.070 <sup>+</sup>	-0.049	-0.054	-0.035	-0.033
Family Size: 3	-0.049	-0.051	-0.049	-0.052	-0.033	-0.032
Family Size: 4	-0.030	-0.030	-0.031	-0.036	-0.047	-0.045
Family Size: 5+	-0.018	-0.020	-0.010	-0.014	0.0020	0.0033
Year=2003	-0.037*	-0.038*	-0.033 <sup>+</sup>	-0.030 <sup>+</sup>	0.0046	0.0042
Year=2005	0.10***	0.10***	0.11***	0.11***	0.11**	0.11**
Year=2007	0.032	0.031	0.028	0.028	0.049	0.049
Constant	-0.13	-0.10	-0.073	-0.053	0.15	0.15
Observations	1262	1262	1295	1295	425	425
R <sup>2</sup>	0.080	0.083	0.077	0.081	0.077	0.077

+  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 5: Models Predicting Changes in Housing Debt, Repeat Homebuyers Only. (Baseline move reason is “Downgrade”; baseline income group is “p81+”)

	(1) Change in housing debt to income	(2) Change in housing debt to income	(3) Change in housing debt to income	(4) Change in housing debt to income	(5) Change in housing debt to income	(6) Change in housing debt to income
Upgrade	0.58***	0.55***				
Other	0.29*	0.46**				
p1-p50	-0.049	-0.057	0.0067	-0.064	0.20	0.18
p51-p80	-0.0083	0.11	0.019	-0.040	0.050	-0.0091
Upgrade x p1-p50		0.30				
Upgrade x p51-p80		-0.11				
Other x p1-p50		-0.51				
Other x p51-p80		-0.12				
Change in Home Size			0.11***	0.044 <sup>+</sup>		
p1-p50 x Change in Home Size				0.14*		
p51-p80 x Change in Home Size				0.096*		
Change in Median Zip Code Price					0.024*	-0.0054
p1-p50 x Change in Median Zip Code Price						0.038
p51-p80 x Change in Median Zip Code Price						0.066***
Nonwhite	0.17	0.15	0.19	0.21	0.42**	0.38**
Married	0.39 <sup>+</sup>	0.39 <sup>+</sup>	0.37 <sup>+</sup>	0.39 <sup>+</sup>	0.73 <sup>+</sup>	0.74 <sup>+</sup>
Female	-0.18	-0.14	-0.16	-0.19	-0.54	-0.53
Age	0.083*	0.077*	0.055 <sup>+</sup>	0.053 <sup>+</sup>	0.18**	0.20***
Age squared/100	-0.091*	-0.083*	-0.062 <sup>+</sup>	-0.060 <sup>+</sup>	-0.22**	-0.23***
Family Size: 2	-0.25	-0.28	-0.28	-0.31	-0.50	-0.51
Family Size: 3	-0.23	-0.26	-0.31	-0.34	-0.81 <sup>+</sup>	-0.81 <sup>+</sup>
Family Size: 4	-0.10	-0.10	-0.18	-0.22	-0.79 <sup>+</sup>	-0.83 <sup>+</sup>
Family Size: 5+	-0.017	-0.037	-0.075	-0.11	-0.57	-0.57
Year=2003	-0.18	-0.20 <sup>+</sup>	-0.12	-0.10	0.27	0.31 <sup>+</sup>
Year=2005	0.023	-0.0027	0.099	0.11	0.22	0.25
Year=2007	0.030	0.0092	0.056	0.052	0.54**	0.54**
Constant	-1.75*	-1.70*	-0.78	-0.64	-2.89*	-3.20*
Observations	1179	1179	1204	1204	385	385
R <sup>2</sup>	0.067	0.085	0.067	0.076	0.124	0.150

+  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



Table 6: Models Predicting Changes in Home Size and Median Zip Code Prices, Non-homeowners only. (Baseline move reason is “Downgrade”; baseline income group is “p51+”)

	(1) Change in Home Size	(2) Change in Home Size	(3) Change in Median Zip Code Price	(4) Change in Median Zip Code Price
Upgrade	0.65***	1.25***	0.24	2.38
Other	0.17	0.71 <sup>+</sup>	0.086	1.39
Upgrade x p1-50		-0.70 <sup>+</sup>		-2.45
Other x p1-50		-0.63		-1.45
p1-50	-0.0062	0.52	0.83	2.40
Nonwhite	0.012	0.012	-0.34	-0.36
Married	-0.017	-0.026	-1.02	-0.98
Female	0.23*	0.23*	0.42	0.40
Age	-0.0018	-0.00041	0.18	0.18
Age squared/100	-0.0048	-0.0070	-0.23	-0.23
Family Size: 2	0.26*	0.25*	-0.87	-0.92
Family Size: 3	0.26 <sup>+</sup>	0.26 <sup>+</sup>	0.034	0.029
Family Size: 4	0.24	0.24	1.64 <sup>+</sup>	1.58 <sup>+</sup>
Family Size: 5+	0.39*	0.38*	0.96	0.98
Year=2003	-0.21	-0.21	-0.20	-0.17
Year=2005	-0.20	-0.21	0.086	0.100
Year=2007	0.093	0.079	0.25	0.23
Constant	-0.24	-0.70	-3.93	-5.30
Observations	2269	2269	878	878
R <sup>2</sup>	0.050	0.053	0.022	0.025

<sup>+</sup>  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

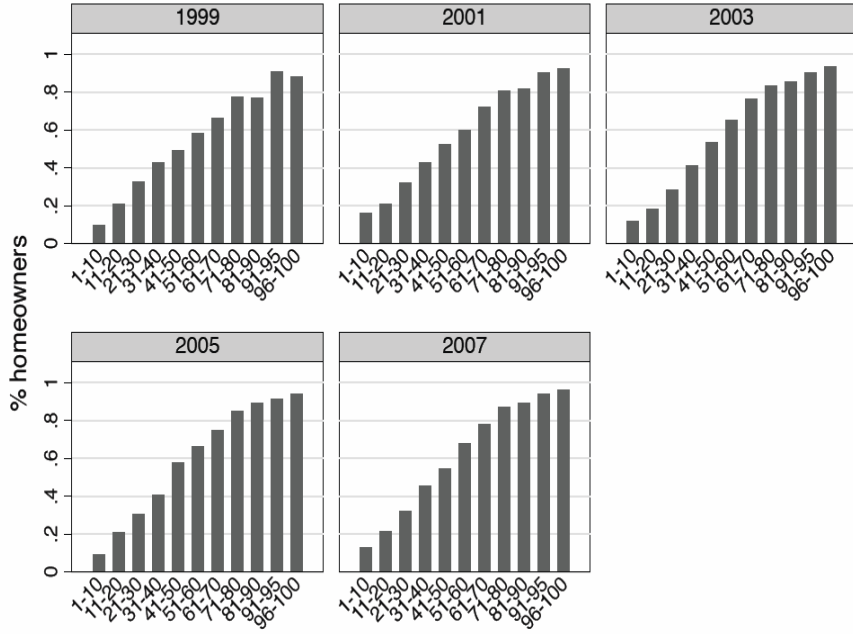
Table 7: Models Predicting Changes in Housing Expenditures, Non-homeowners Only. (Baseline move reason is “Downgrade”; baseline income group is “p51+”)

	(1) Change in housing expenditures to income	(2) Change in housing expenditures to income	(3) Change in housing expenditures to income	(4) Change in housing expenditures to income	(5) Change in housing expenditures to income	(6) Change in housing expenditures to income
Upgrade	0.076**	0.0049				
Other	0.049*	-0.0056				
p1-50	0.021	-0.036	0.012	0.0067	0.00025	0.0066
Upgrade x p1-50		0.082*				
Other x p1-50		0.063				
Change in Home Size			0.032***	0.010*		
p1-50 x Change in Home Size				0.026**		
Change in Median Zip Code Price					0.0044	-0.0053*
p1-50 x Change in Median Zip Code Price						0.013*
Nonwhite	-0.034 <sup>+</sup>	-0.034 <sup>+</sup>	-0.027	-0.028	-0.074*	-0.075*
Married	0.0020	0.0026	-0.035	-0.034	-0.088*	-0.095*
Female	-0.023	-0.023	-0.018	-0.019	0.072 <sup>+</sup>	0.077*
Age	-0.00011	-0.00035	-0.0036	-0.0037	-0.012	-0.012
Age squared/100	0.0011	0.0014	0.0058	0.0061	0.019	0.019
Family Size: 2	0.0012	0.0025	-0.0043	-0.0031	0.015	0.021
Family Size: 3	-0.019	-0.019	-0.022	-0.022	0.031	0.035
Family Size: 4	0.0024	0.0030	0.027	0.028	0.049	0.060
Family Size: 5+	0.029	0.029	0.040	0.041	0.10*	0.11*
Year=2003	0.057*	0.056 <sup>+</sup>	0.064*	0.062*	0.091*	0.090 <sup>+</sup>
Year=2005	0.10***	0.10***	0.12***	0.12***	0.075 <sup>+</sup>	0.074 <sup>+</sup>
Year=2007	0.022	0.023	0.019	0.019	0.0039	0.0026
Constant	-0.062	-0.0081	0.047	0.052	0.12	0.12
Observations	2503	2503	2395	2395	917	917

<sup>+</sup>  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Figure 1

Panel A: Fraction of Households who are Homeowners, by income groups, PSID.



Panel B: Mean debt to income for homeowners (see text for definitions of measures).

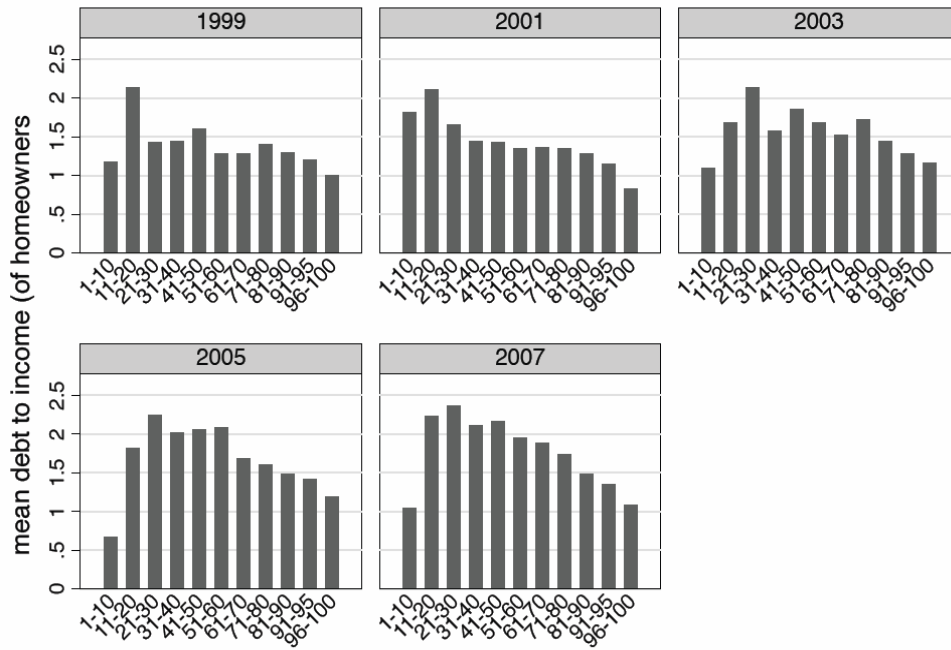


Figure 2: Percent of each move by income group.

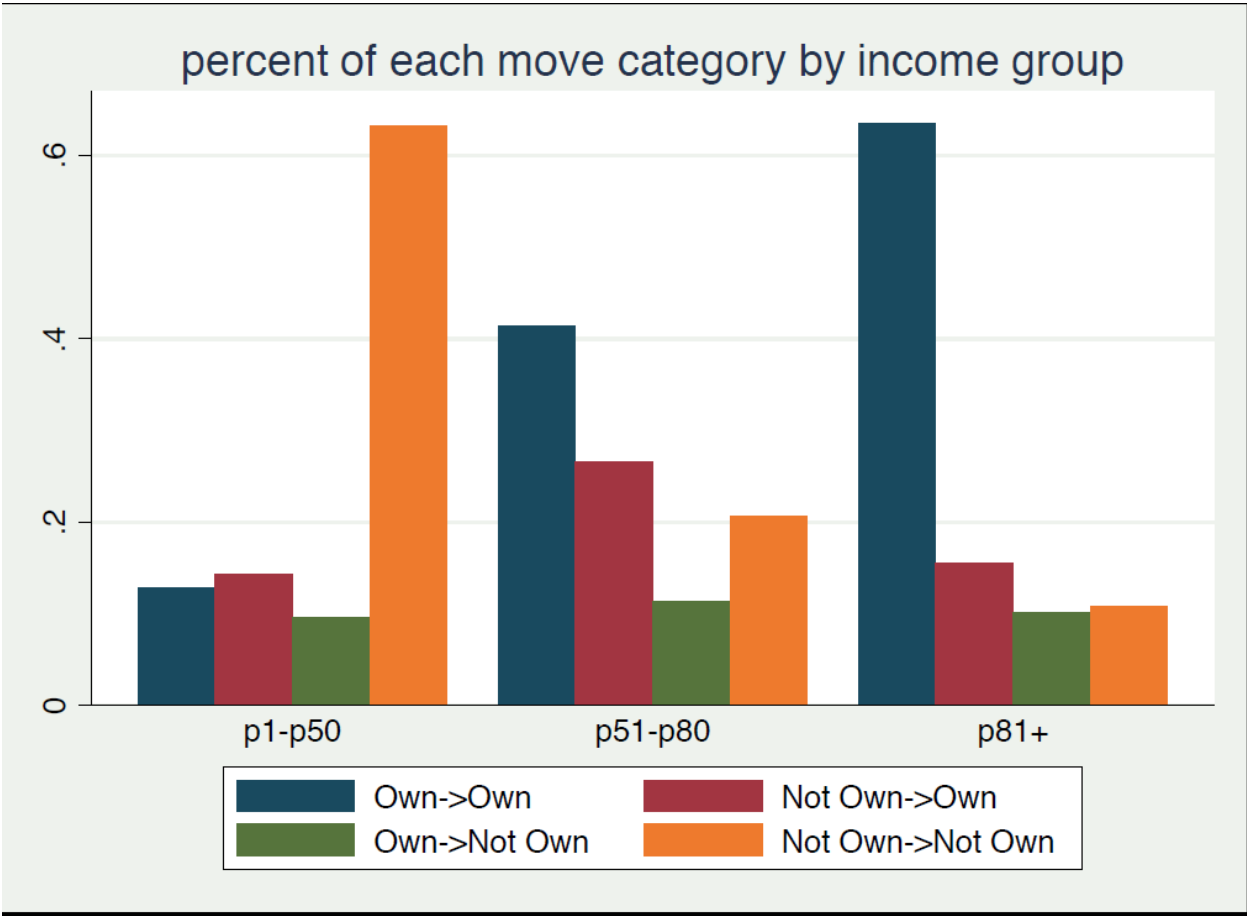
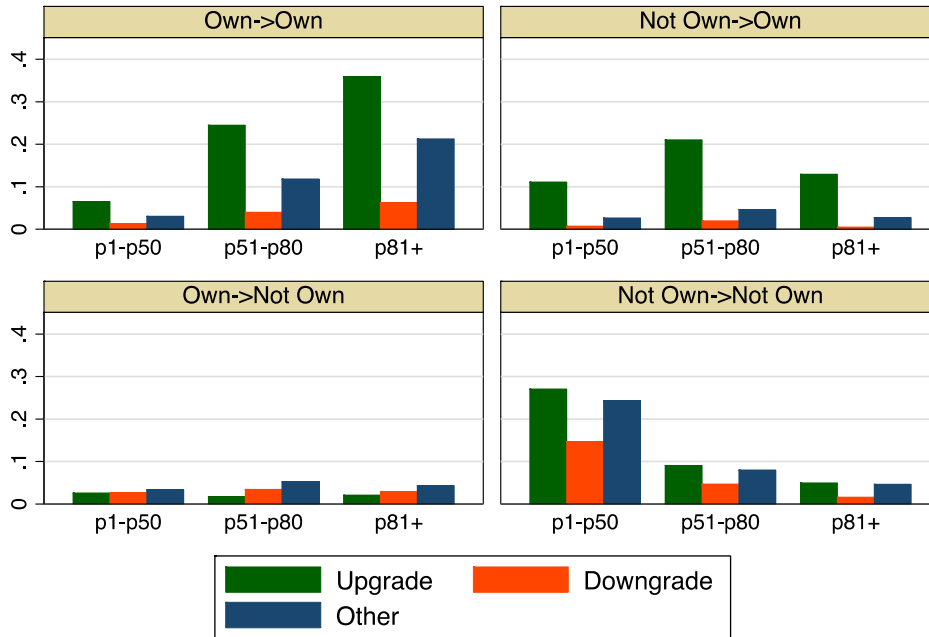
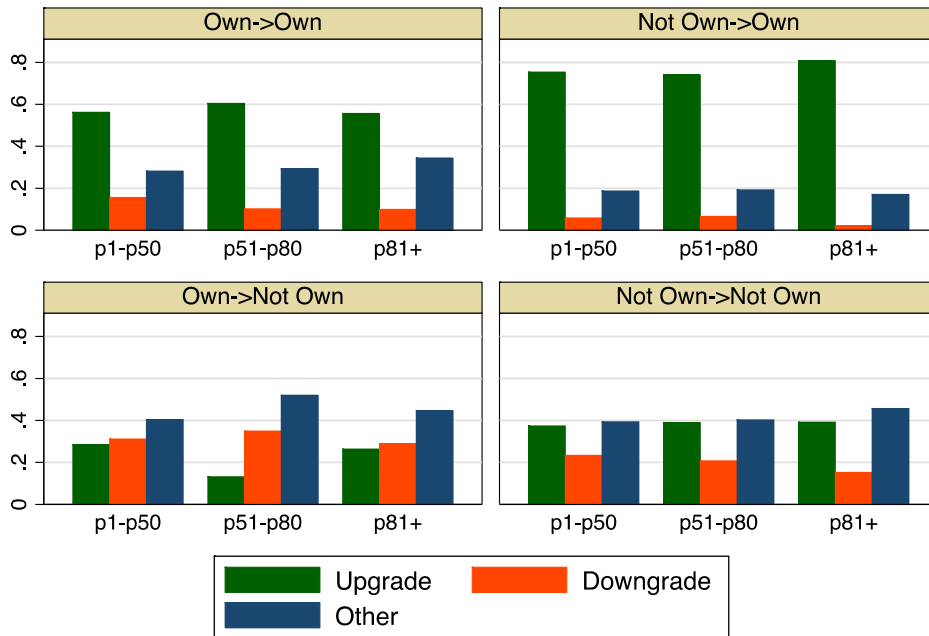


Figure 3: Percent with each Reason for Moving and Housing Transition Category  
 Panel A: As a Fraction of the all moves for Each Income group.



Graphs by Housing Transition

Panel B: As a Fraction of moves for each Housing Transition Category and Income group.



Graphs by Housing Transition