

# **Why Did Young Families Lose So Much Wealth During the Crisis?**

## **The Role of Homeownership**

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We use the Federal Reserve's Survey of Consumer Finances to document a boom in homeownership and mortgage borrowing among young families in the years leading up to the recent financial crisis. Many young households lost more of their wealth during the downturn than middle-aged and older households. We find that about three-quarters of the decline in the average young family's wealth between 2007 and 2010 was due to its exposure to residential real estate. For middle-aged and older households, housing losses contributed about 53 percent and 40 percent of the total decline in wealth, respectively. Regression evidence suggests that young families' wealth, on average, was unusually highly concentrated in housing and these households' debt burdens were extremely high at the peak of the boom.

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## **Why Did Young Families Lose So Much Wealth During the Crisis?**

### **The Role of Homeownership**

Recently released data from the Federal Reserve's Survey of Consumer Finances (SCF) reveal that many young families suffered proportionately larger financial losses during the housing market downturn and accompanying recession than did middle-aged and older households. The average level of wealth in 2010 for young families (i.e., with heads younger than 40 years of age) declined by 43.8 percent, or \$68,071, from the average level in 2007.<sup>1</sup> Meanwhile, the average level of wealth for middle-aged families (i.e., with heads between 40 and 61 years of age) declined by only 17.4 percent; levels for older families (i.e., with heads 62 years of age or older) declined by just 10.3 percent.

What accounts for these differences in loss of household wealth? Were there warning signs in the balance sheets of young households before the crash that indicated this group was particularly vulnerable to a collapse of the housing market or some other asset category? Do the financial setbacks suffered by many younger households in recent years represent a break from previous trends in wealth accumulation at different stages across the life cycle or a continuation of a long-term trend?

We document a boom and bust in homeownership and mortgage borrowing among young families that exceeded even the substantial aggregate boom and bust. Other asset and liability categories changed little among most young households.

We provide evidence that a large increase in exposure to residential real estate made many young homeowners quite vulnerable to the housing market crash and ensuing recession.

We show that mortgage debt played two somewhat opposing roles in the boom and bust. On the one hand, a large increase in the amount of mortgage debt on the balance sheets of young households during the housing boom facilitated their rapid buildup of real estate exposures, paving the way for leveraged wealth destruction when the housing bubble burst. On the other hand, significant deleveraging during the bust—through voluntary paydowns of mortgage principal, negotiated principal reductions, short sales, and mortgage defaults—served as a balance-sheet buffer, or safety valve. This is because any decrease in a household’s liabilities in excess of any associated loss of assets increases its net worth, by accounting definition. Of course, short sales and mortgage default come with a heavy cost in the form of damaged creditworthiness; but any reduction in negative homeowner’s equity moves a household’s net worth in a positive direction.<sup>2</sup>

This article examines age-specific trends in household balance sheets and wealth between 1989 and 2010 using eight regular waves of the Federal Reserve’s triennial SCF plus the 2007-09 panel dataset.<sup>3</sup> We rely primarily on data from the Federal Reserve’s SCF, supplementing these rich cross-sectional financial snapshots of the population with other data sources. In addition to the age dimension of homeownership and mortgage borrowing, we also disaggregate the survey data to highlight the role of educational attainment and racial and ethnic identity in determining which young households were most affected by the surges and subsequent declines in homeownership, house prices, and mortgage borrowing. By exploiting the survey’s household-level detail in a multiple-regression framework and controlling for a variety of factors, we confirm that the homeownership rate among young families was elevated at the peak of the housing boom (2004-07) relative to the rate that would have been expected based on earlier trends.

Was it apparent before the downturn that young homeowners had risky levels of debt? Although the average mortgage loan-to-home value (LTV) ratios for young homeowners in 2004 and 2007 changed little from previous years, broader measures of leverage or debt burden, such as the total debt-to-total assets (DTA) ratio and the total debt-to-family income (DTI) ratio, departed notably from historical norms during the mid-2000s. Post-crash evidence (2007-09) confirms that debt burden measures were significant predictors of financial distress and wealth losses. Hence, balance-sheet data available before the crash revealed that younger families were dangerously exposed to the effects of a severe housing downturn. The ensuing loss of wealth continued a two-decade trend of younger families' wealth failing to keep pace with the wealth of their middle-aged and older counterparts.

We first document wealth and income trends by age group between 1989 and 2010. The next section examines homeownership and borrowing trends. This examination is followed by a detailed analysis of the race or ethnicity and educational-attainment dimensions of young families, further illuminating the largest shifts in homeownership and borrowing behavior over time. We then report the results of regression analyses of the pre-crash buildup of real-estate holdings and mortgage debt as well as post-crash delinquency rates.

## **NET WORTH AND INCOME TRENDS BY AGE GROUP**

The shocks to the balance sheets of U.S. households between 2007 and 2010 were the worst in the 21-year history of the SCF in its current form (see the boxed insert). Declines in net worth spread across virtually every segment of the population. Nonetheless, younger families suffered some of the largest percentage wealth losses. This section provides evidence that

residential real estate was a major culprit in wealth declines between 2007 and 2010 among many younger families.

### ***Net Worth and Income: Means and Medians***

The mean percentage decline in net worth between 2007 and 2010 was 15.2 percent for all families. (See Emmons and Noeth, 2012, for tables with detailed breakdowns of mean and median family net worth and income by age group between 1989 and 2010.) Older families (headed by someone aged 62 or older) lost an average of 10.3 percent, middle-aged families (headed by someone aged 40 to 61) lost an average of 17.4 percent, while younger families (headed by someone younger than 40 years) lost 43.9 percent.<sup>4</sup> The wealth losses suffered by younger families were so severe that, on average, their net worth in 2010 was significantly lower than in 1989, after adjusting for inflation. Despite sizable recent losses, the average wealth of middle-aged and older households in 2010 remained significantly higher than in 1989.

Changes in average family incomes across age groups were qualitatively similar. The smallest percentage declines between 2007 and 2010 were among older families and the largest declines were among younger families, although the differences across age groups were smaller for income than for net worth. As was true for net worth, average inflation-adjusted income was lower only for younger families in 2010 than in 1989.

Median net worth and income changes were largely consistent with changes in the means—albeit with fewer stark distinctions between younger and middle-aged families (see Emmons and Noeth, 2012). The percentage wealth declines measured for the younger and middle-aged households at their respective medians between 2007 and 2010 (–37.6 percent and –42.5 percent, respectively) were similar. These declines were much larger than the decline in

the median net worth among older households measured in 2007 and 2010, respectively (–6.3 percent).

### ***A Balance-Sheet “Waterfall” to Illustrate Contributions to Net Worth Declines***

As a matter of accounting, a household’s net worth equals the value of its assets minus the value of its liabilities. As a corollary, the change in net worth equals the sum of changes in all asset categories minus the sum of changes in all liability categories. Thus, net worth declines when an asset category *decreases* or when a liability category *increases*, holding all else constant. Conversely, net worth rises when an asset *increases* or when a liability *decreases*.

Table 1 displays a simple accounting decomposition of the change between the 2007 and 2010 surveys in the mean inflation-adjusted net worth of all households. Changes in broad balance-sheet categories sum down the page, constituting a “waterfall” of individual contributions that drop down to the total change in net worth at the bottom. The first column of numbers shows the change between 2007 and 2010 in the average inflation-adjusted value of three broad asset categories and two broad liability categories, as well as the left-hand side (assets) and right-hand side (liabilities) of the balance-sheet totals. The largest change in an asset category was a \$50,885 decline in the average inflation-adjusted value of residential real estate between 2007 and 2010. The largest change in a liability category was a \$4,271 decline in the average inflation-adjusted value of mortgage debt, which, through balance-sheet arithmetic, contributed the same amount toward *increasing* the average family’s net worth.

The second column of numbers in Table 1 translates the dollar changes in each line into percent changes. The individual percent changes in this column do not sum to the percent change in net worth at the bottom because each percent change refers only to that line item. The third

column of numbers provides a decomposition of the average family's change in inflation-adjusted net worth between 2007 and 2010 into percent contributions by each balance-sheet component.

The decline in the average value of residential real estate on the balance sheets of all households between 2007 and 2010 contributed 57.5 percent of the total change in net worth. A decline in the average value of financial and business assets contributed 45.6 percent of the change in net worth, and a small decline in the average value of durable goods contributed 1.5 percent of the change in net worth. A \$4,061 decrease in liabilities between 2007 and 2010 contributed a positive 4.6-percentage-point change to net worth.

## **HOMEOWNERSHIP AND BORROWING TRENDS AMONG YOUNGER FAMILIES**

This section documents housing, mortgage, and net-worth trends across our three broad age groups. In the next section, we disaggregate the balance sheets of young families along the dimensions of educational attainment and race or ethnicity.

### ***Homeownership Rates***

The overall homeownership rate increased about 5 percentage points between 1994 and 2004, from 64 percent to 69 percent (Figure 1).<sup>5</sup> By age group, the homeownership rate increased more than the national average during the housing boom (peaking variously between 2004 and 2006) among all 5-year age groups with household heads younger than 40 years (Figure 2A). The homeownership rate among all 5-year age groups with household heads between 40 and 74 years rose less than the national average (Figures 2B and 2C). The open-ended age group covering household heads aged 75 and older increased slightly faster than the national average during the boom.

The increases in homeownership rates among young households were large. Among households headed by someone younger than age 25, for example, the homeownership rate increased from about 15 percent to almost 26 percent, or about 11 percentage points, between 1994 and 2005—more than twice as large as the population average. Among households headed by someone between 25 and 29 years of age, the homeownership rate increased from about 34 percent to almost 42 percent, about 8 percentage points. At the other end of the age spectrum, households headed by someone 75 years or older experienced an increase of about 6 percentage points between 1994 and 2006.

Since its peak in the 2004-06 period, the homeownership rate has declined in virtually every 5-year age group every year since then. Only the four groups with household heads younger than age 40 and the 75 and older group increased by more than the national average while the boom was ongoing. After mid-decade, homeownership rates fell sharply in all age groups except the 65 and older groups. Only among households headed by someone 70 years or older has the homeownership rate continued to reach new highs in recent years. This may be due to some older homeowners delaying the sales of their homes in hopes that prices will rebound soon, or it could be due to changes in the age structure within the oldest age group, which covers the open-ended interval from 75 years upward. We return to the behavior of the oldest households later.

### ***Ratios of Residential Real Estate Assets to Income and to Total Assets***

**Income.** The average ratio of residential real estate assets to income among young families increased noticeably between the 2001 and the 2007 surveys, as it also did for other age groups. Increases in both the incidence of homeownership among households of a certain age



group (the extensive margin) and average housing values (the intensive margin) caused the ratios to rise; Figure 3 captures the combined effect of changes along both these margins of homeownership. Between 2007 and 2010, the extensive margin (declining homeownership rate) and the intensive margin (falling house prices) both contributed to a greater decline for younger households than for older households.

Among home-owning households alone (i.e., excluding the extensive margin's contribution to changes), the ratio of residential real estate assets to income increased most sharply between 2001 and 2007 among the young—by 119 percentage points compared with 101 percentage points among middle-aged homeowners and 68 percentage points among older families (not shown). The subsequent decline between 2007 and 2010 was greatest among young households—down 62 percentage points compared with 27 percentage points among middle-aged families and a mere 1 percentage point among older households.

**Total Assets.** Figure 4 shows that the asset portfolios of young families have long been more heavily concentrated in residential real estate than have those of middle-aged or older households. The average share of housing in the overall asset portfolio for young households increased 11.3 percentage points between 2001 and 2007, compared with 7.9 and 5.3 percentage points for middle-aged and older households, respectively. The 2007-10 decline in the housing portfolio share among young households was slightly less than for the two other groups, leaving the 2010 housing portfolio share of young families still at a historically high level (58.5 percent). Compared with their respective housing portfolio shares in 1989, the share for young families was 6.5 percentage points higher in 2010, while the share for middle-aged families was 2.5 percentage points lower and the share for older households was just 1.9 percentage points higher.

Interestingly, much of the economics and finance literature on housing either takes the high housing portfolio concentration of younger families as a given<sup>6</sup> or ignores life cycle differences in housing portfolio shares altogether.<sup>7</sup> Thus, the reasons for high concentration of young families' portfolios in housing, together with high balance-sheet leverage, remain promising areas for future research.

### ***Mortgage Incidence***

The share of young homeowners with any mortgage debt has been higher than the respective shares of middle-aged and older homeowners for at least as long as the SCF has been gathering data. This finding is consistent with a life cycle interpretation of mortgage borrowing, in which households borrow when young and seek to pay off their indebtedness over time, rather than maintaining a relatively constant debt-to-equity ratio, as would be typical of a mature business corporation, for example.

Figure 5 shows that between 80 percent and 90 percent of homeowners headed by someone younger than age 40 had mortgage debt in each of the eight surveys since 1989, compared with a somewhat lower share of middle-aged homeowners and a much lower share of older homeowners. A remarkable feature of the data revealed by Figure 5 is that the share of older homeowners with mortgage debt almost doubled between 1989 and 2010, from 24 percent to 46 percent. This feature is not consistent with a simple life cycle interpretation of mortgage borrowing and probably is due to the increasing use of home equity by older homeowners as a source of liquidity.<sup>8</sup> The significant increase over time in the share of older households with mortgage debt is striking, but the incidence of 46 percent in 2010 still is only about half the rate of young households, at 90 percent.

### ***Mortgage Debt Ratios***

In contrast to rising debt-to-income (DTI) ratios and real estate portfolio shares between 2001 and 2007 (see Figures 3 and 4), the ratios of mortgage debt to the value of residential real estate and of total debt to total assets (DTA) changed somewhat less during the boom years (Figures 6 and 7).<sup>9</sup> This was a result of the rapid appreciation of housing and other asset values. Figure 6 shows that the average ratio of mortgage debt to the value of the residential real estate securing it (the mortgage loan-to-housing value, or LTV ratio) increased only 2 percentage points among young homeowners between 2001 and 2007, from 57 percent to 59 percent.<sup>10</sup> Among middle-aged homeowners, the increase was 0.7 percentage points. Among older homeowners, the increase was 3 percentage points, but the average LTV ratio remained very low in 2007, at 13 percent.

The large decline in housing values that followed 2007, together with the relatively fixed nature of mortgage debt, is reflected in spikes in average LTV ratios in 2010. Among young homeowners in 2010, the reported average LTV ratio was 74 percent, a huge 15-percentage-point jump from its 2007 level. The average LTV ratios among middle-aged and older homeowning households increased 7 and 5 percentage points, respectively. Compared with 1989 levels, the average LTV ratio among young homeowners in 2010 was 23 percentage points higher, while the ratios were 17 and 14 percentage points higher among middle-aged and older homeowners, respectively.

A broader measure of indebtedness that captures non-mortgage and mortgage debt, all types of assets, and includes both homeowners and renters is the average DTA ratio among all households (see Figure 7). On this metric, deterioration (both short- and long-term) in the

balance sheets of young families through 2007 is more evident than when examining the narrower LTV ratio. The average young household substituted 9 percentage points of debt for equity (both measured relative to total assets) in financing its portfolio between 2001 and 2007—that is, the average DTA ratio increased from 31 percent to 40 percent. Between 2007 and 2010, the DTA ratio increased an additional 10 percentage points, largely because asset values declined sharply, destroying equity. Thus, the cumulative substitution of debt for equity on the balance sheet of the average young family amounted to 20 percentage points between 1989 and 2010, moving the average DTA ratio from 30 percent to 50 percent.

Pronounced increases in residential real estate exposure and large increases in leverage—either LTV or DTA—have left the average young household in a weak financial position as of 2010. Even today, some seven or so years after the peak in homeownership rates among young households, the incidence of “negative equity”—when a household’s mortgage debt exceeds the market value of the house it secures—is much higher among young homeowners than homeowners in older age groups.<sup>11</sup> Thus, the average young family has much less borrowing capacity and less ability to weather new economic or financial storms than a decade ago. Moreover, the need to strengthen balance sheets by reducing debt means many young families will save more and spend less for some time, detracting from overall economic growth.

### ***The Net-Worth Waterfall for Older, Middle-Aged, and Young Households***

The evidence discussed so far points toward residential real estate as a major contributor to the unusually large wealth losses among young families. The earlier waterfall analysis provides a convenient way to quantify the roles of housing and other balance-sheet items in wealth losses suffered by households of different ages.

Table 2 separates the changes in major asset and liability categories between 2007 and 2010 into the three age categories. For older households, the largest contributor to the decline in wealth between 2007 and 2010 was a \$46,327 loss in the value of financial and business assets. This represented about 50 percent of the total net-worth loss for this group. Losses in residential real estate contributed about 40 percent to the total wealth decline, while an increase in mortgage debt of \$10,697 contributed another 11.5 percentage points (in an accounting sense) to the average net-worth decline of \$92,748. The average total decline between 2007 and 2010 was 10.3 percent of 2007 wealth.

The second panel of Table 2 details the sources of net-worth declines among middle-aged families. The most important items were a \$64,819 average loss in the value of residential real estate (53.2 percent of the total wealth loss) and a \$57,437 decline in the average value of financial and business assets (47.1 percent of the decline in net worth). Changes in liabilities were of little consequence.

Finally, the third panel in Table 2 reveals that the primary source of loss of wealth among young families between 2007 and 2010 in an accounting sense was their exposure to residential real estate. About 75 percent of the average wealth decline can be traced to the average \$51,014 decline in housing assets. This is remarkable in light of the fact that only 50 percent of families under 40 were homeowners in 2007. In other words, the losses suffered by young homeowners dominated balance-sheet developments among all young families. Meanwhile, losses on financial and business assets contributed 46 percent, while durable goods contributed 4.5 percent of the average net loss. Unlike either of the other age categories, young households shed a substantial \$17,614 of total debt, reducing their average net-worth decline by 26 percent.

Of course, this accounting exercise overstates the benefit associated with reducing debt to the extent that some of the debt was eliminated by giving up valuable assets—such as a house or a car—in a default. Moreover, a default, short sale, or other retirement of debt by distressed borrowers exacts a toll on the household’s credit rating, which can restrict access to credit and raise future borrowing costs. A voluntary paydown of debt from a household’s other resources is a wash from a net-worth perspective because a dollar of assets (cash) is surrendered for each dollar of liability extinguished, leaving net worth unchanged. Reducing debt through scheduled amortization or a voluntary paydown does reduce balance-sheet leverage, however, which reduces the household’s sensitivity to further asset price declines.

## **EDUCATIONAL AND RACE OR ETHNICITY DIMENSIONS OF YOUNG FAMILIES’ BALANCE SHEETS**

The SCF allows us to disaggregate young households along a number of demographic dimensions, including educational attainment and race or ethnicity. We distinguish among three levels of educational attainment and between two race or ethnicity categories. The educational-attainment levels are (i) heads of households who have not finished high school (“less than high school” or “dropouts”), (ii) heads of households with a high school diploma or a General Educational Development (GED) certificate (“high school graduates”), and (iii) heads of households with either a two-year or four-year college degree (“college graduates”). Unlike age and education, race and ethnicity questions are asked only of the survey respondent and not the head of the household. Accordingly, our partition of household race and ethnicity is based on the survey respondent. The two race or ethnicity categories are (i) “historically disadvantaged minorities” or “minorities,” which includes African Americans and Hispanics of any race; and

(ii) whites, Asians, and other non-disadvantaged minorities, which we abbreviate as “whites and non-disadvantaged minorities” or “non-minorities.”

For ease of exposition, we compare homeownership and debt trends across different levels of educational attainment within the two racial and ethnicity groups separately. We find that both educational attainment and race or ethnicity play important roles in shaping housing and borrowing trends, but these differences generally appear less significant for homeownership and borrowing decisions than those we identified across age categories. In other words, the life cycle may be the most important factor in understanding housing and mortgage borrowing behavior. Young families from different educational and race or ethnicity backgrounds appear more similar to each other than to households of the same race or educational background in older age groups.<sup>12</sup>

### ***Homeownership Rates***

Young minority households are significantly less likely to be homeowners than are young nonminority households, holding constant the level of household educational attainment (Figures 8 and 9). Within each racial or ethnic group, college graduates are the most likely and those with less than a high school education are the least likely to be homeowners. Homeownership rates among young families in 2007 ranged from 24 to 56 percent among minority households of different educational-attainment levels and from 52 to 65 percent among nonminority households. These ranges overlap their counterpart ranges for middle-aged and older families only slightly.<sup>13</sup>

Small sample sizes make inference somewhat tentative, but it appears that the largest increases in homeownership rates in the years preceding 2007 were among college graduates,

both minority and nonminority.<sup>14</sup> After averaging about 38 percent in the four surveys between 1989 and 1998, the homeownership rate among young minority college graduates averaged about 54 percent in the 2001, 2004, and 2007 surveys. Among young nonminority college graduates, the homeownership rate increased less but from a higher base—from an average of 58 percent during the 1989-98 period to about 63 percent during the 2001-07 period.

Although it is difficult to see in the figures, the increase in the average homeownership rate from the earlier period (1989-98) to the later period (2001-07) was three times as large for minority college graduates as for either minority high school graduates or minority families with less than a high school education. The 5-percentage-point increase for nonminority college graduates was noticeably higher than the 2-percentage-point increase among nonminority households with less than a high school education or the 0.5-percentage-point decline in the rate for high school graduates.

Homeownership rates for virtually all young groups declined between 2007 and 2010. Among all young minority families, the 3.5-percentage-point decline in the homeownership rate reversed about half of the increase experienced between the earlier period (1989-98) and the later period (2001-07). For all young nonminority households combined, the 2-percentage-point increase was completely reversed by 2010.

### ***Ratios of Residential Real Estate Assets to Income and to Total Assets***

Although young minority families have lower homeownership rates than young nonminority households with the same level of education, the average ratios of residential real estate to household income and to total assets for minority families reached or exceeded corresponding average levels for nonminorities at the peak of the housing boom (Figures 10 and



11 for income, ratios to assets not shown). In other words, although proportionally fewer young minority households were homeowners, the collective exposure of young minorities to residential real estate by 2007 was comparable to or greater than the exposure faced by young nonminority households. Consequently, those young minority families that were homeowners actually had significantly greater exposure to housing markets than did their nonminority counterparts relative to both income and total assets.

Figure 10 shows that young minority families of all education levels more than doubled their holdings of residential real estate relative to family income between 2001 and 2007. This surge is particularly noteworthy because the real estate-to-income ratio had been relatively stable before 2001 for all education groups. Figure 11 reveals a remarkably similar pattern among young nonminority households, albeit with a higher typical real estate-to-income ratio before 2001 than among young minority households and, therefore, a somewhat smaller proportionate increase in the ratio between 2001 and 2007. Among young nonminority households, only the group with less than a high school education doubled its average real estate-to-income ratio over that period.

The average portfolio share of real estate generally was higher for young minority families throughout the period covered by the surveys, especially for households with less than a high school education (not shown). The average real estate portfolio share among young nonminority households was relatively stable before 2001 and then increased through 2007.

Declines in the real estate portfolio share between 2007 and 2010 were particularly sharp for young families with less than a high school education in both racial or ethnic categories. The underlying data reveal that virtually all the decline was due to lower real estate holdings rather

than lower income. For young minority families with less than a high school education, the average value of residential real estate owned was 81 percent lower in 2010 than in 2007; average income was only 1 percent lower. For young nonminority families with less than a high school education, the average value of residential real estate owned was 56 percent lower in 2010 than in 2007, while average income was 20 percent lower.

An important risk faced by many young homeowners is elevated medium- and long-term price volatility of lower-priced homes, which younger families are more likely to buy, compared with the lower volatility of higher-priced homes in the same markets. This feature of many regional housing markets suggests that lower-priced housing itself may be a risk factor that should be recognized.

### ***Mortgage Incidence***

When the survey results for the “pre-boom period”—1989, 1992, 1995, and 1998—were averaged to increase the sample sizes, 74 percent of young minority homeowners had mortgage debt, while 88 percent of young nonminority homeowners had mortgages. During the “boom period”—2001, 2004, and 2007—mortgage incidence was 85 percent and 91 percent for young minority and nonminority families, respectively. In “post-boom” 2010, 82 percent and 92 percent of young minority and nonminority families had mortgage debt, respectively. Thus, mortgage incidence rose and fell more among minorities. College-educated young families generally were the most likely to have mortgage debt throughout the entire period. Young households of any race or ethnicity with less than a high school education were much less likely than other young families to have mortgage debt throughout the period covered by the surveys.

### ***Mortgage and Debt Ratios***

Figure 12 shows average mortgage LTV ratios for all young families in a single chart, again dividing the group along race or ethnicity and educational-attainment dimensions and grouping the surveys into three time periods to increase sample sizes. A jump between the pre-boom 1990s and the housing-boom 2001-07 period occurred in four of the six categories, excluding only nonminority college graduates and nonminority families with less than a high school education.

The increase in average LTV ratios between the 2001-07 average and the 2010 survey was both universal and quantitatively large. The percentage-point increases in average LTV ratios ranged between 9 and 27, with an average across the six groups of 15 percentage points. Most of the increase in LTV ratios was due to falling real estate values rather than increases in mortgage debt.

A broader measure of debt burden is the overall DTI ratio, which includes mortgage and non-mortgage debt in the numerator. The overall pattern is qualitatively similar for young minority and nonminority families, albeit with a few notable differences. White and Asian young families typically had higher average DTI ratios than their disadvantaged counterparts in every year of the survey except 2007. For young minority families, average 2007 DTI ratios were more than double their 2001 levels in each educational subgroup. A steep increase in DTI ratios among young minority families between 2001 and 2007 was followed by very sharp declines by 2010. Among all young families, average inflation-adjusted income declined about 12 percent between 2007 and 2010, while average debt decreased about 17 percent. Most of the decline was in mortgage debt.

## **REGRESSION EVIDENCE: YOUNG FAMILIES WERE UNUSUALLY EXPOSED TO A HOUSING CRASH**

Previous sections showed that homeownership rates among young families increased significantly from the mid-1990s through the mid-2000s before falling back. Moreover, the importance of residential real estate assets to the average young family—both relative to family income and as a share of total assets—increased notably between 2001 and 2007. The incidence and amount of mortgage debt increased also. This section describes regression evidence confirming that younger families were unusually exposed to a housing market crash.<sup>15</sup>

### ***Homeownership Rate and Real Estate Portfolio Concentration***

The household-level detail of the SCF allows us to use a multiple-regression framework to verify the existence of a shift in the propensity for young families to become homeowners, holding many important family characteristics and overall market trends constant. Table 3 presents the results of three logit regressions that use the pooled data from the six surveys conducted in 1992, 1995, 1998, 2001, 2004, and 2007. The 1989 survey was omitted because it did not ask if income exceeded spending (i.e., if the family saved), one of our independent variables (to proxy for financial capability). The 2010 data were omitted because our purpose here is to determine whether the homeownership rate among young families was unusually high in 2007, before the housing market crashed. The dependent variable in each regression is equal to 1 if the family owned its primary residence and 0 if it did not.

The first regression uses demographic variables and time dummy variables as well as dummy variables that interact the survey year and membership in the young category. The second regression uses idiosyncratic variables along with all of the dummy variables, where we

measure a family's deviation from its relevant subgroup mean for each variable. For example, the number of kids deviation variable measures how many more kids a young, college-educated white or Asian family has than the average number of kids in that demographic group. The third regression uses all demographic and idiosyncratic variables along with all of the dummy variables.

The results show that a family's educational attainment, age, race or ethnicity, marital status, family size, income, and saving behavior all are statistically significant predictors of whether a particular family is a homeowner. Regression (3) is our preferred specification, which shows all of the following relationships:

- Educational attainment is strongly positively correlated with homeownership propensity, holding all else constant;
- Homeownership rates rise strongly with age, holding all else constant;
- Blacks and Hispanics are much less likely to be homeowners than whites and Asians, holding all else constant; and
- Married couples, families with more children, families with higher incomes, and families that save all are more likely to be homeowners, all holding other factors constant.

The simple time dummies in regression (3) are insignificantly different from zero. This suggests that, when controlling for the demographic and idiosyncratic factors described above, there was no statistically significant trend toward higher homeownership between 1992 and 2007. This may seem surprising, given the overall increase in homeownership rates reported in Census data between the mid-1990s and mid-2000s. A likely explanation for our results is that

the changes in the overall homeownership rate were fully explained by changes in the variables in our regression, rather than by an exogenous time trend. In that sense, there may have been no “homeownership bubble”, but rather, a rational increase in the homeownership rate driven by changes in population.

These results are interesting in their own right, but our main focus of interest in Table 3 is the last set of variables, which test for any unusual behavior in the homeownership rate among young families in any year. To be clear, these dummy variables take a value of 1 if a particular family was young and owned its home in a given year (1995, 1998, 2001, 2004, or 2007); it is zero otherwise. Young homeowners in 1992 are the omitted category.

The 2007 young-year interaction result is striking. Even when we control for demographics, idiosyncratic variations, and time effects, there still was an unusually high homeownership rate among young families in 2007. Thus, young families as a group were unusually highly exposed to homeownership in 2007, just as the housing market collapsed.

Table 4 approaches the question of young families’ exposure to the housing market by regressing a family’s residential real-estate portfolio share—i.e., the share of its total assets invested in housing—on the same sets of independent variables described above. Because the housing portfolio share cannot go below zero, we use a Tobit regression model. The statistically significant estimate of the “Sigma” parameter reported in the last row of the table indicates that a Tobit specification is needed to counteract the effect of “censored” observations, that is, zero values. The number of zero values is reported under each regression.

The demographic, idiosyncratic, and time-dummy variables produce qualitatively similar results for housing portfolio shares compared to the homeownership regressions, albeit with some interesting differences. The educational-attainment and age relationships are not as clearly monotonic as in Table 3, for example. A few year dummies are significant, while the saving variable is not.

Our primary variables of interest—the interacted year and young-family dummy variables—tell the same story as before. In this case, both 2004 and 2007 stand out as years in which young families on average had unusually large portfolio concentrations in housing, controlling for all of the other factors that may be associated with housing investment. Thus, Tables 3 and 4 both suggest that many young families had above-normal exposure to a housing crash due to an elevated homeownership rate and high housing portfolio shares.

### ***Borrowing by Young Families***

Table 5 reports the results of Tobit regressions of a family’s debt-to-assets (DTA) ratio on the independent variables described above. Regression (3) again is our preferred specification, which shows all of the following relationships:

- There is an inverted-U shape relationship between educational attainment and a family’s DTA ratio, holding all else constant;
- DTA ratios decline across the life cycle, holding all else constant;
- Blacks and Hispanics have somewhat higher DTA ratios than whites and Asians, holding all else constant; and
- DTA ratios are slightly higher for larger families, holding all else constant;
- DTA ratios decline with income, holding all else constant;

- Savers have noticeably lower DTA ratios, holding all else constant; and
- DTA ratios were unusually high in 2004 and 2007, holding all else constant.

A key result is that, when controlling for a variety of factors, the average DTA ratio was unusually high among all families in 2004 and 2007, as shown by significant positive coefficient estimates on the dummy variables for those years. Although the year-young family interaction dummy variable is not significant, recall that the average DTA ratio among young families is statistically significantly higher than for middle-aged families which, in turn, is significantly higher than for older families. Thus, the unusually high DTA ratios in 2004 and 2007, together with young families' higher average DTA ratios, mean that young families' balance sheets were highly leveraged as the housing market crashed.

### ***After the Crash: Delinquency Rates***

The 2007-09 SCF panel dataset allows us to track individual households during the most intense phase of the financial crisis and recession. The model described in Table 6 uses as its dependent variable a dummy variable that equals 1 if a family has experienced a spell of delinquency of two months or longer within the year preceding the 2009 re-interview on any debt. The sample is restricted to those with any debt in 2007.

Unsurprisingly, a spell of unemployment is a strong predictor of delinquency, although sickness was not. Families with lower levels of education and more children had more delinquencies. Variables that may proxy for higher levels of financial capability—such as saving, holding liquid assets, borrowing less than their available credit, and avoiding past credit problems—also predicted fewer delinquencies. Holding everything else constant, homeowners



had significantly fewer delinquencies. This may indicate that mortgage debt was easier to refinance than the forms of debt renters held, allowing homeowners to avoid some delinquencies.

Of more immediate interest for us are the significant positive coefficients on a family's LTV and DTI ratios in 2007. The significance of these ratios suggests that the sources of delinquency were not unusual during the recent downturn. Nor was youth per se a risk factor. Instead, it was individual young families' exposure to well-known risk factors such as high debt ratios that mattered. As we found earlier, many younger households had incurred high levels of debt, especially in the form of mortgages. Elevated delinquency rates, therefore, are not surprising.

## **CONCLUSION**

The financial hardships suffered by many younger families during the recent financial crisis and recession reinforce a trend of widening wealth disparity across age groups over the past 20 years. The average inflation-adjusted net worth of a middle-aged or older family increased by 38 percent and 68 percent, respectively, between 1989 and 2010. The average net worth of a family headed by someone younger than 40 years of age was 26 percent lower in 2010 than it was in 1989. We showed that rising exposure of young families to homeownership, financed largely with mortgage debt, was a significant factor in the continuation during the crisis of this long-standing age-based disparity in wealth accumulation.

In particular, we documented a large boom and bust in homeownership and mortgage borrowing among young households in recent years. We found that, in an accounting sense, about three-quarters of the wealth decline for the average young family between 2007 and 2010 was due to its exposure to residential real estate. For middle-aged and older families, housing

losses contributed only about 53 percent and 40 percent of the total wealth decline, respectively. Regression evidence suggested that young families were unusually highly concentrated in housing, with abnormally high debt levels, just as the housing market crashed.

Even after large declines in homeownership rates, the value of real estate holdings, and debt outstanding, young families remained highly exposed to real estate risk in 2010. Housing represented about 53 percent of the average young family's assets in 2010, while the average DTI ratio remained 158 percent (of which 78 percent was mortgage debt). By way of contrast, the average housing portfolio share of young families was only 43 percent in 2001, while the average DTI ratio was 102 percent. If housing markets and the economy remain weak, many young families will continue to struggle in achieving or maintaining financial stability.

More research is needed to understand why young families became unusually highly exposed to the housing market, with unusually high balance-sheet leverage, just as the housing market peaked. In other work, we argue that economic vulnerability and risky balance sheets are correlated in the population because they derive from common factors.<sup>16</sup> These include a low stock of human capital, inexperience (relative youth), and, in some cases, the legacy of discrimination in housing, education, and employment. We conclude that individuals and families that are young, less cognitively able, and/or members of historically disadvantaged minorities are more likely to be both economically vulnerable and hold risky balance sheets due to low financial knowledge.

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## **BOXED INSERT: The Federal Reserve’s Survey of Consumer Finances**

The Survey of Consumer Finances (SCF) is a triennial cross-sectional survey of several thousand households. In its current form, it has been conducted eight times, beginning in 1989, with the most recent survey in 2010. The SCF is the only survey conducted over an extended period of time in the United States that provides comprehensive data for a representative sample of U.S. families on the distribution of assets and debts, along with related economic information and other data items necessary for analyzing the financial behavior of all families. The Federal Reserve makes household-level data from the survey available to the public free of charge with about a two-year lag. Two panel studies for two-date periods have been conducted for 1983-89 and 2007-09. In this article, we use the cross-sectional and the 2007-09 panel data.

The SCF is conducted using a two-part sample design. First, there is an area probability sample, in which a random selection of households across the nation is interviewed. In addition, there is a list sample, which oversamples wealthy households, as inferred from Internal Revenue Service data. Adjustments are made after the data have been gathered to restore the correct sample proportions to the respondents along a number of important dimensions.

Recent SCF sample sizes have been increased, but they remain small for performing detailed examinations—particularly of the undersampled groups who are not wealthy, such as young, minority, and less-educated households. Sample sizes in the last three waves of the SCF were 4,519 (in 2004), 4,421 (in 2007), and 6,492 (in 2010).

Participation in the survey is voluntary and all responses remain strictly confidential. In an effort to protect the confidentiality of even the wealthiest respondents, some responses in the public data are altered to make it impossible to identify individual households. Geographic detail is not included in the public data in an additional effort to maintain confidentiality.

Figure 1

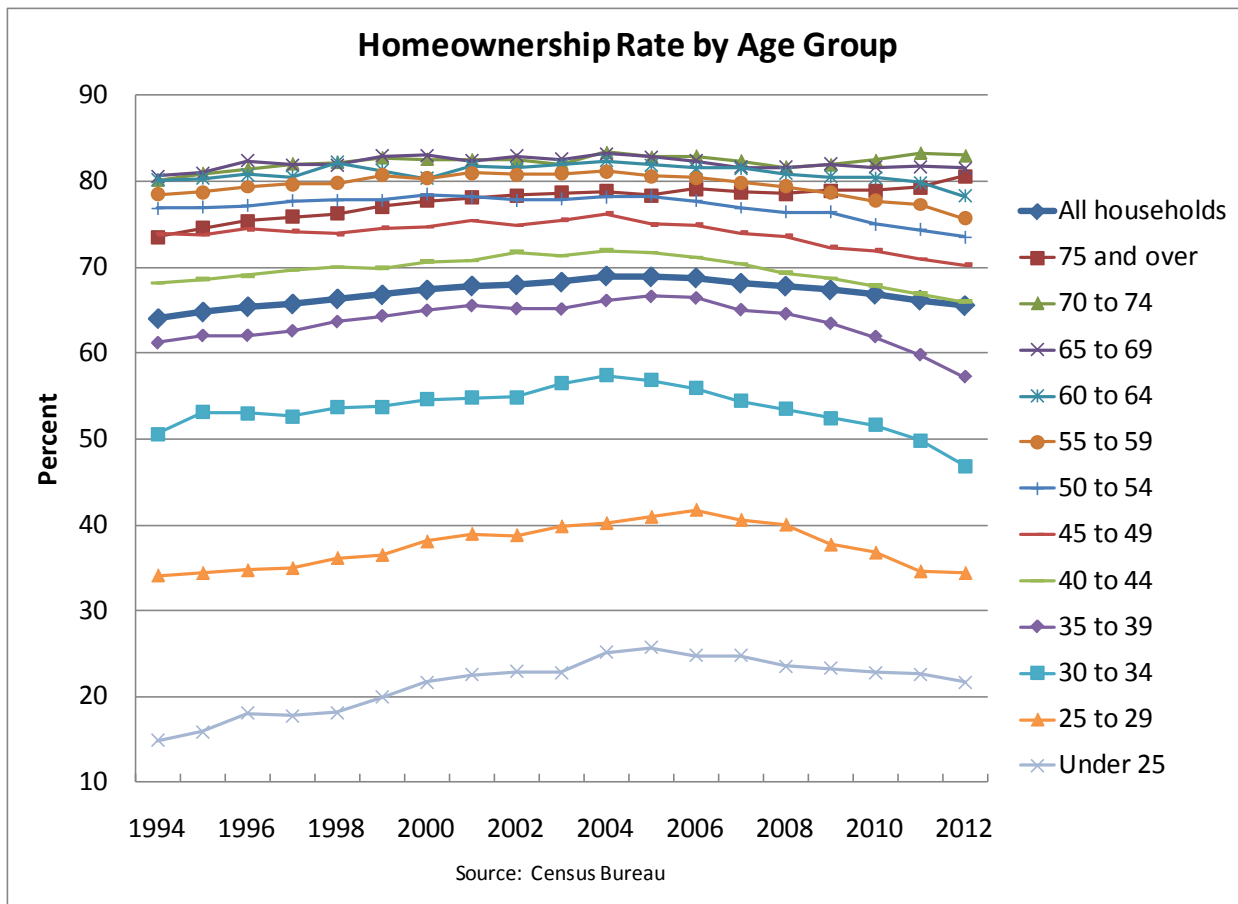


FIGURE 1

Homeownership Rate by Age Group

NOTE: Data for 2012 are third quarter, not seasonally adjusted.

SOURCE: U.S. Census Bureau.

Figure 2A

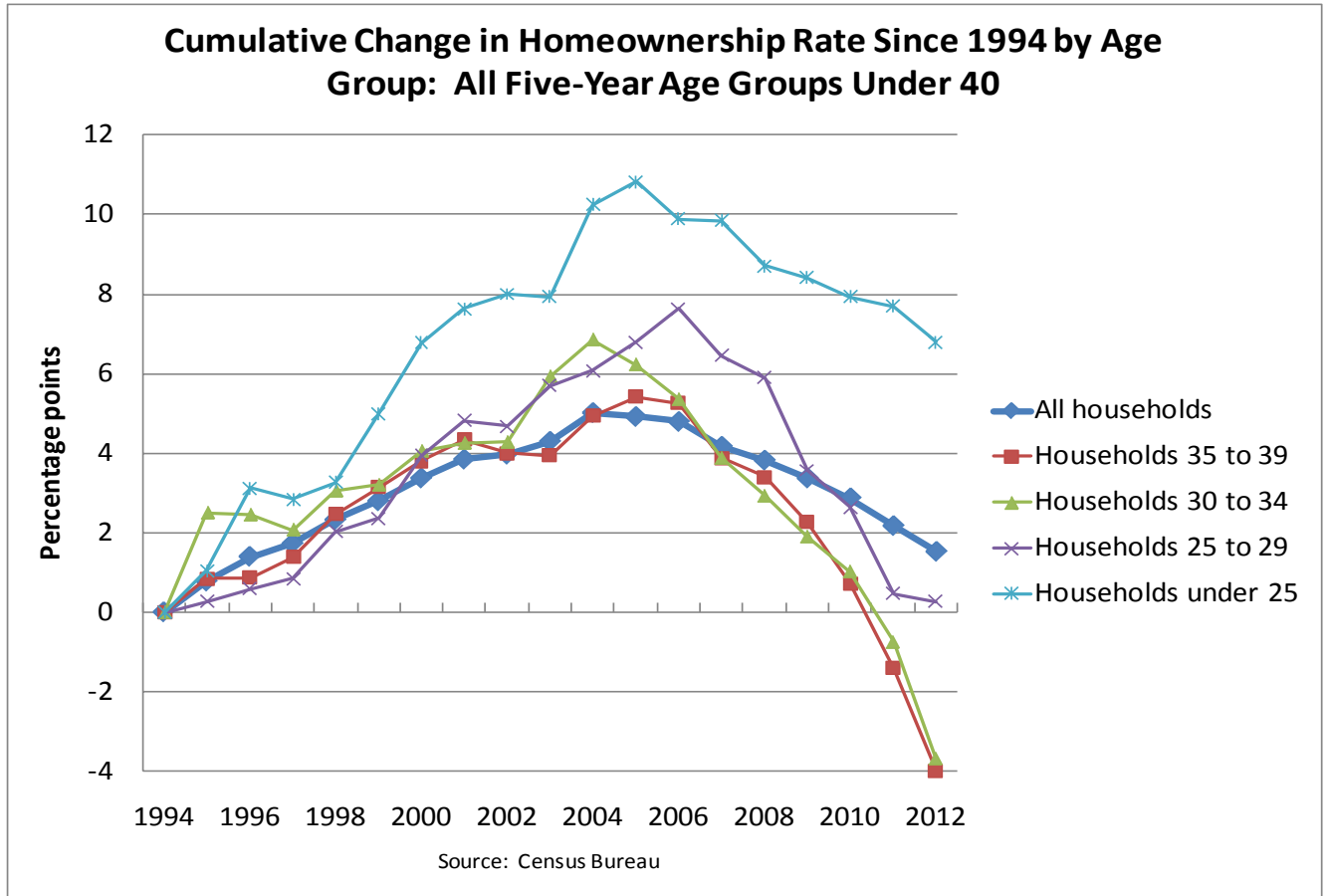


FIGURE 2A

**Cumulative Change in Homeownership Rate Since 1994 by Age group: All 5-Year Age Groups Younger than 40 Years**

SOURCE: U.S. Census Bureau.

Figure 2B

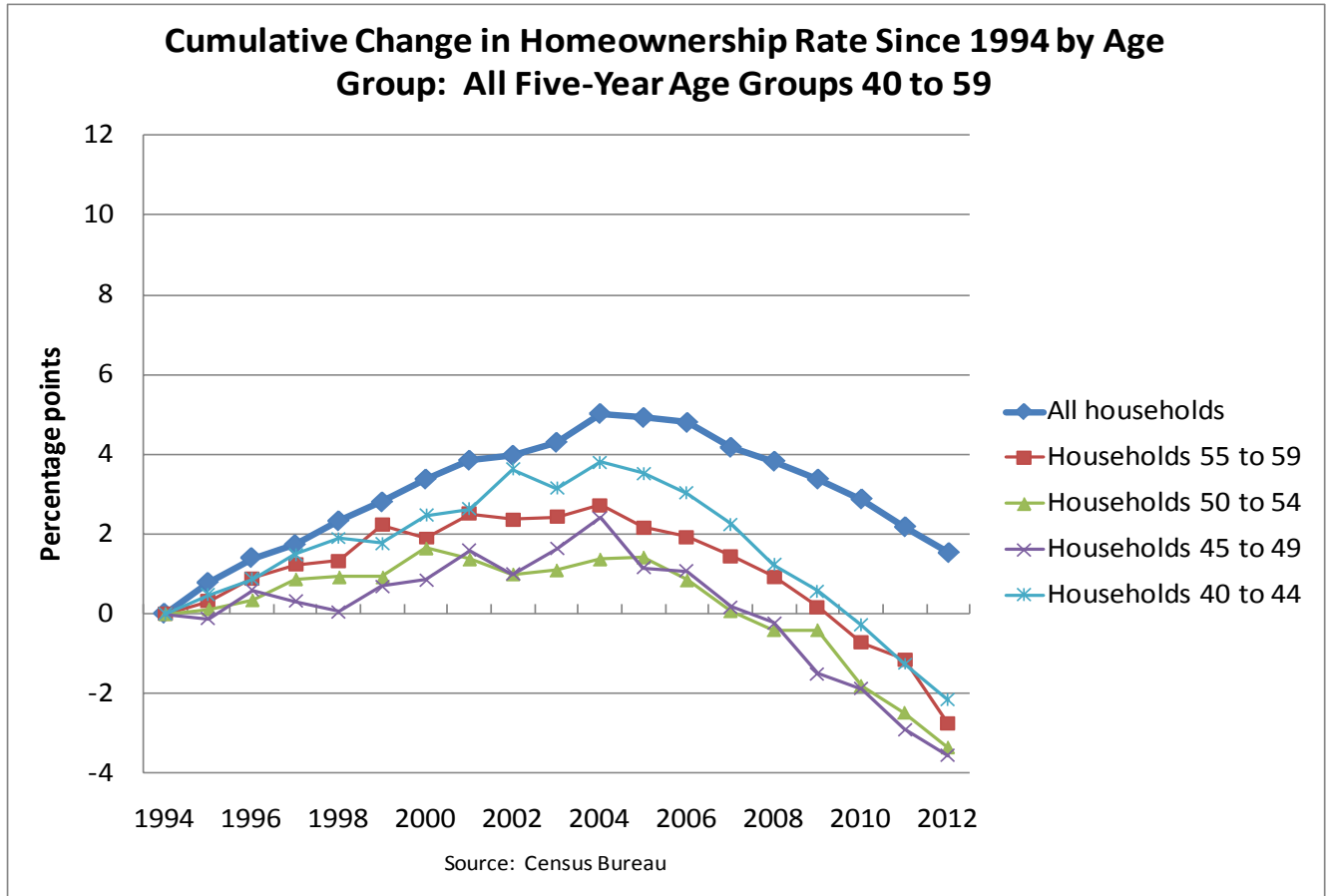


FIGURE 2B

Cumulative Change in Homeownership Rate Since 1994 by Age Group: All 5-Year Age Groups 40 to 59 Years

SOURCE: U.S. Census Bureau.



Figure 2C

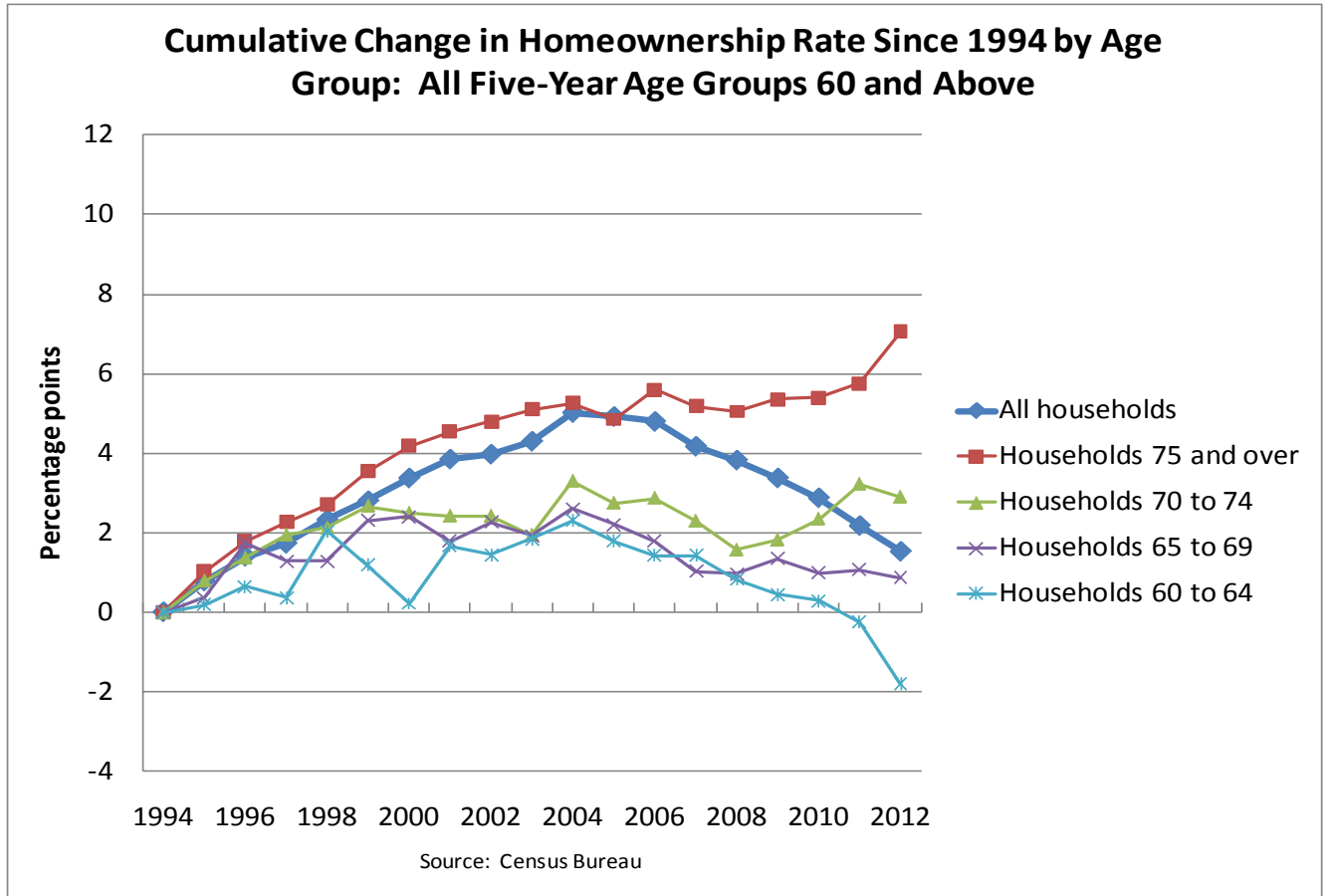
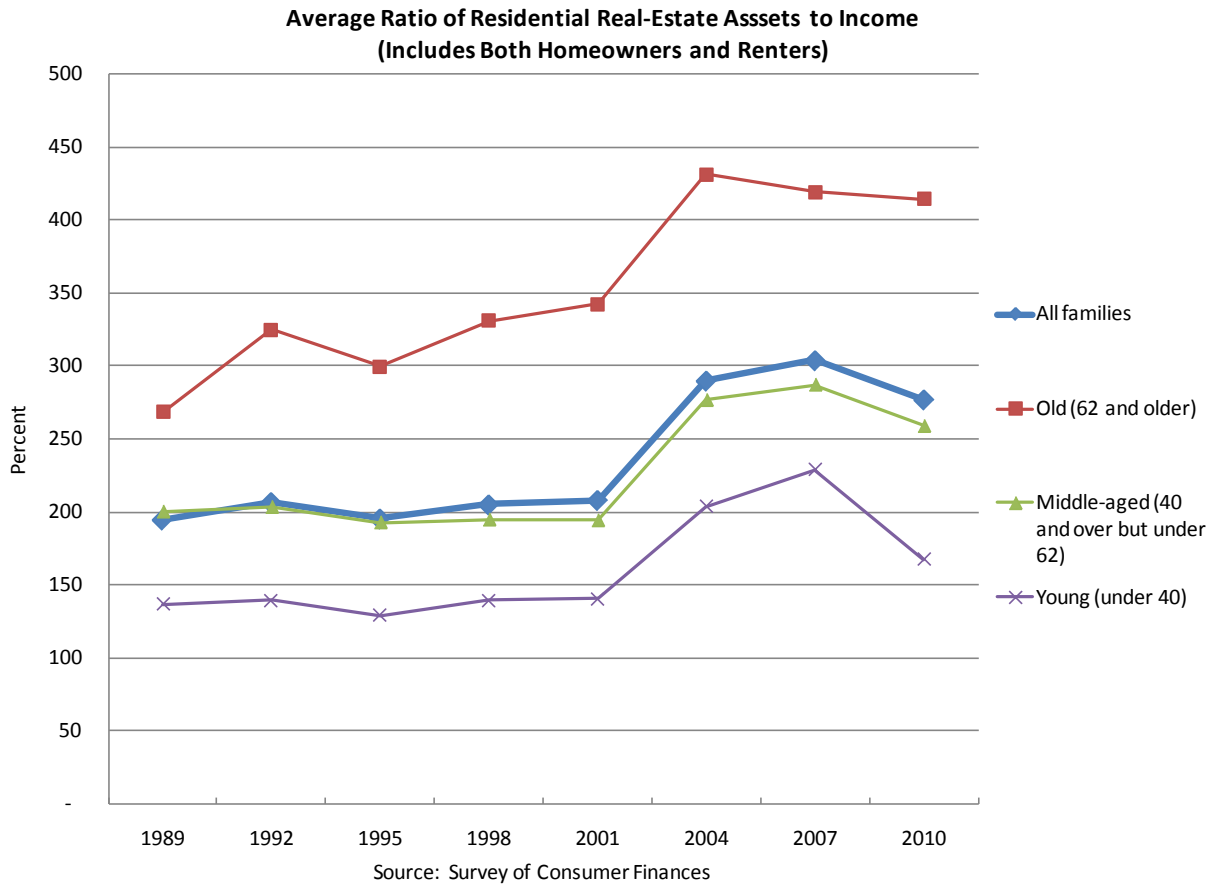


FIGURE 2C

**Cumulative Change in Homeownership Rate Since 1994 by Age Group: All 5-Year Age Groups 60 Years and Older**

Source: U.S. Census Bureau.

**Figure 3**

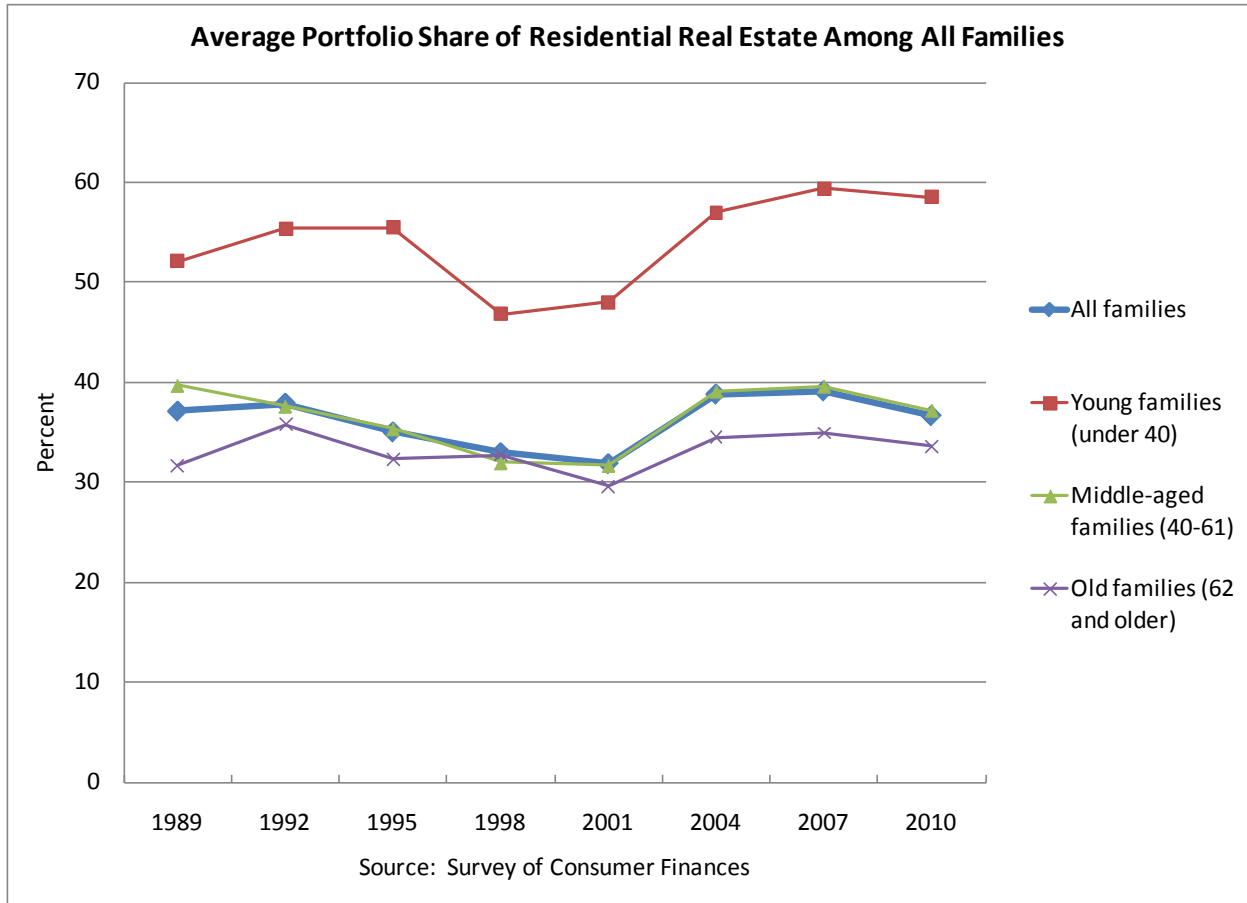


**FIGURE 3**

**Average Ratio of Residential Real Estate Assets to Income (Homeowners and Renters)**

SOURCE: Survey of Consumer Finances.

**Figure 4**

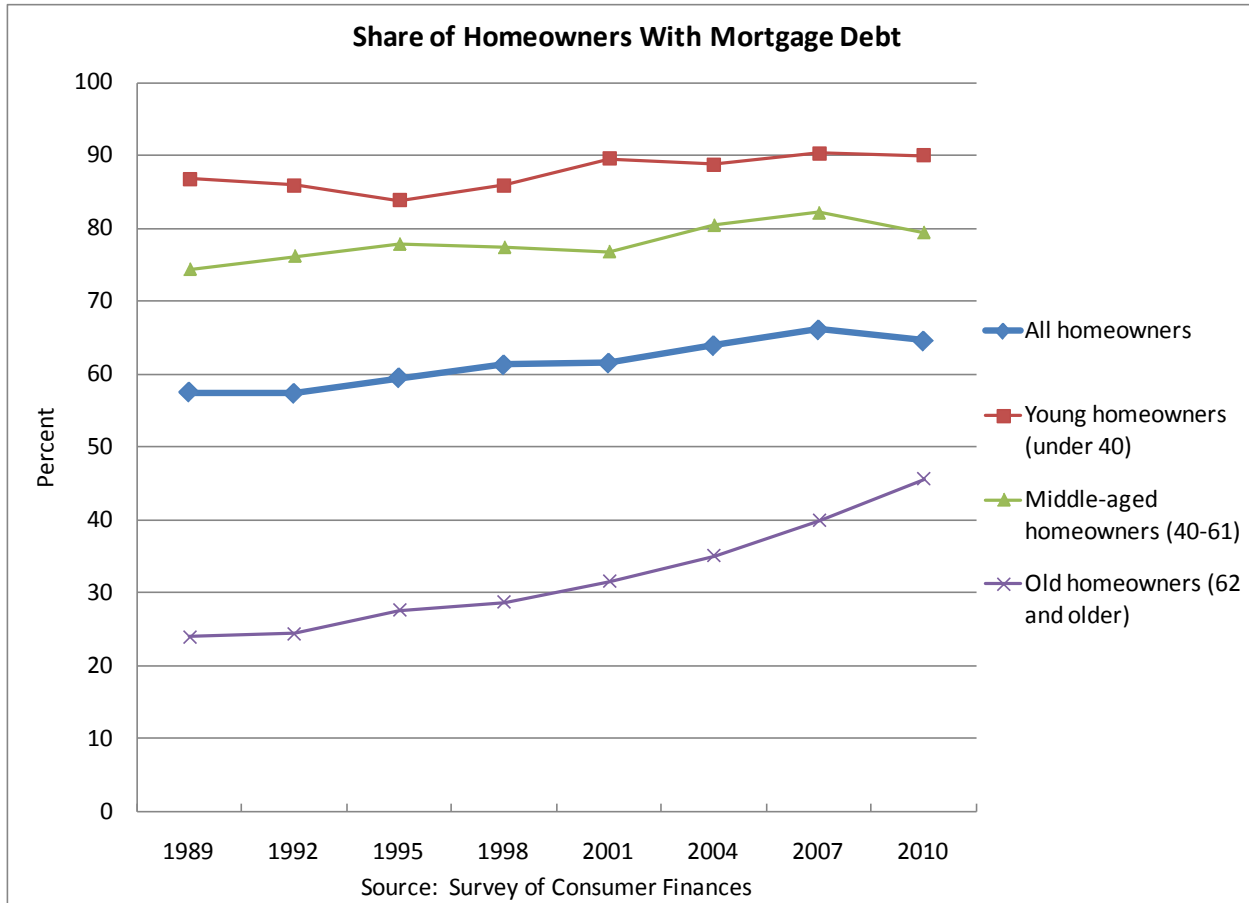


**FIGURE 4**

**Average Portfolio Share of Residential Real Estate among All Families**

SOURCE: Survey of Consumer Finances.

**Figure 5**

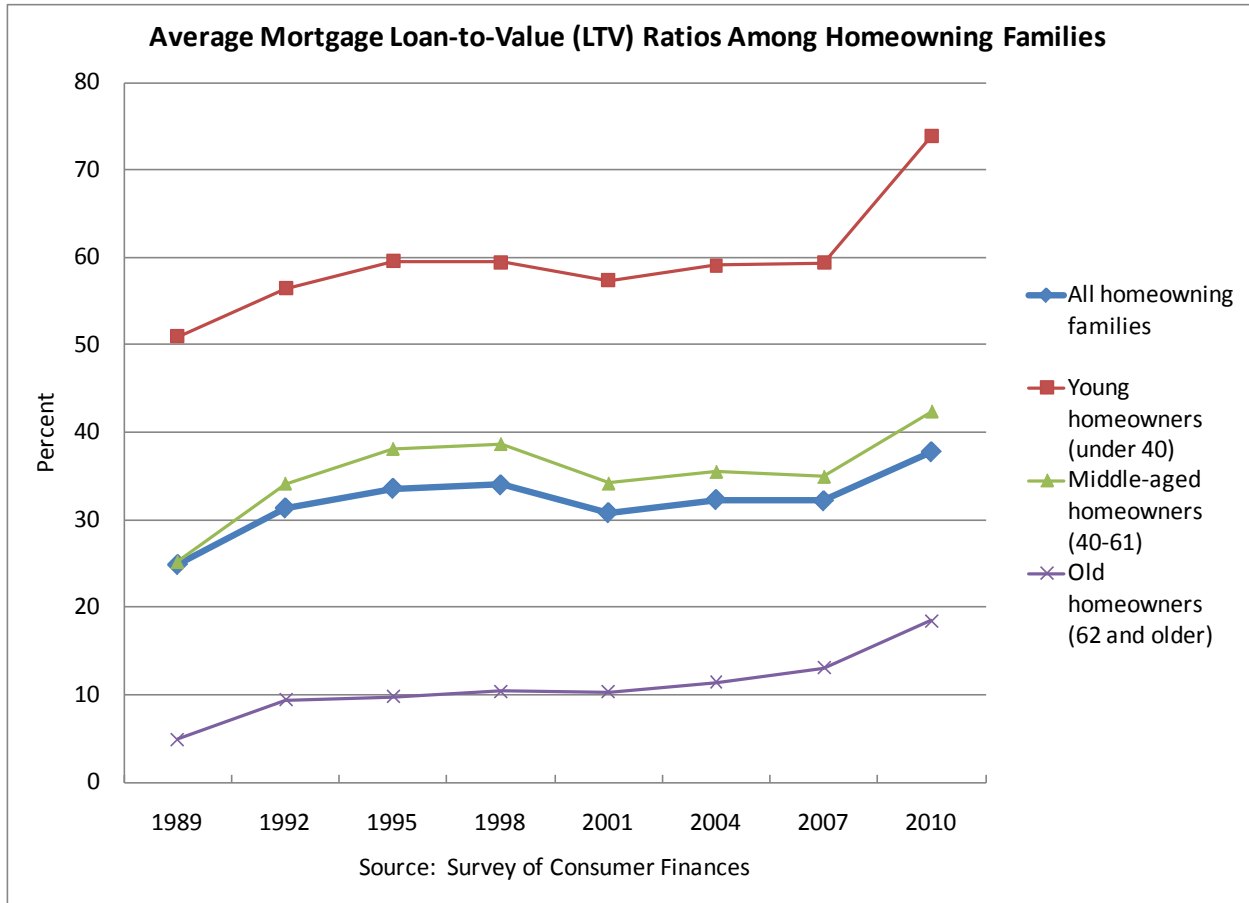


**FIGURE 5**

**Share of Homeowners with Mortgage Debt**

SOURCE: Survey of Consumer Finances.

**Figure 6**

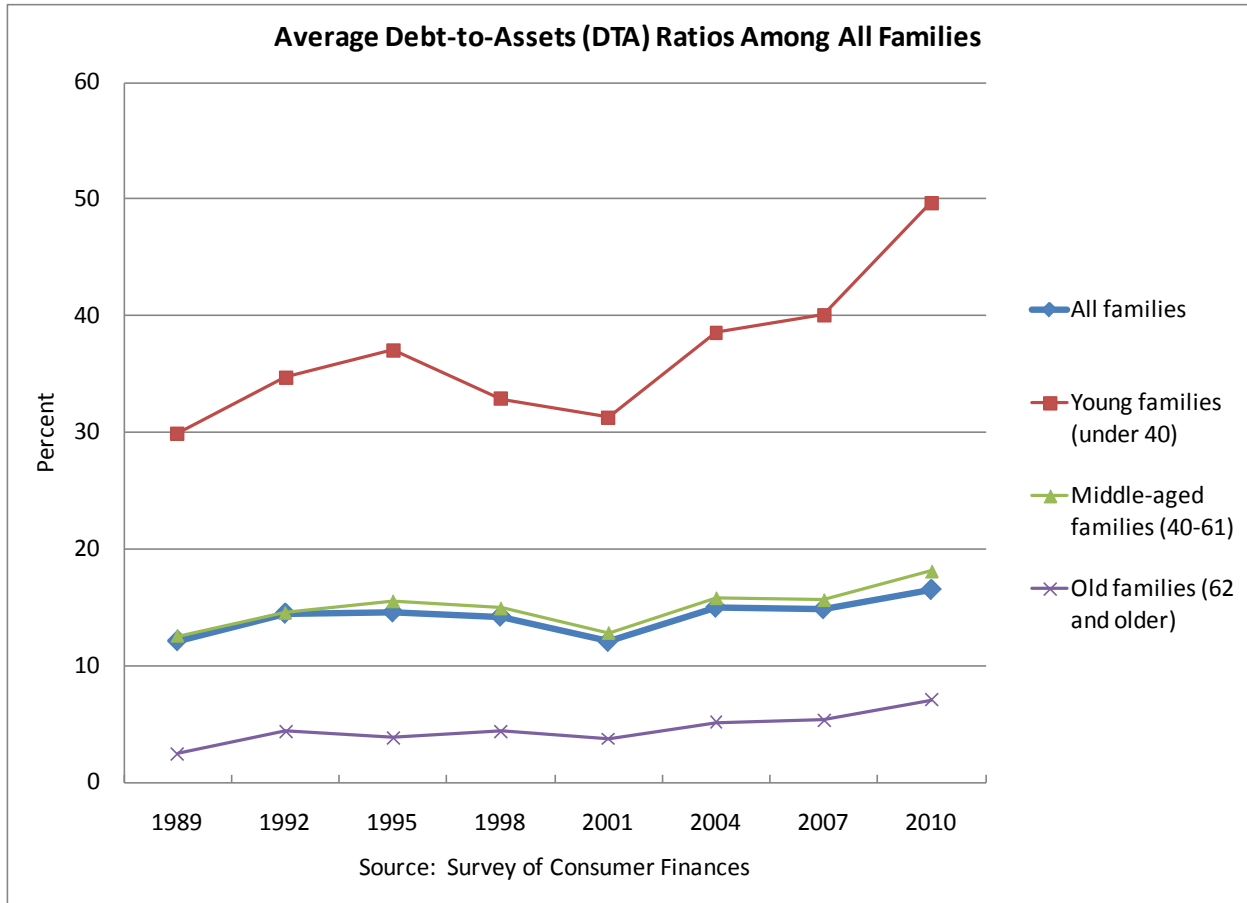


**FIGURE 6**

**Average LTV Ratios among Homeowners**

SOURCE: Survey of Consumer Finances.

**Figure 7**

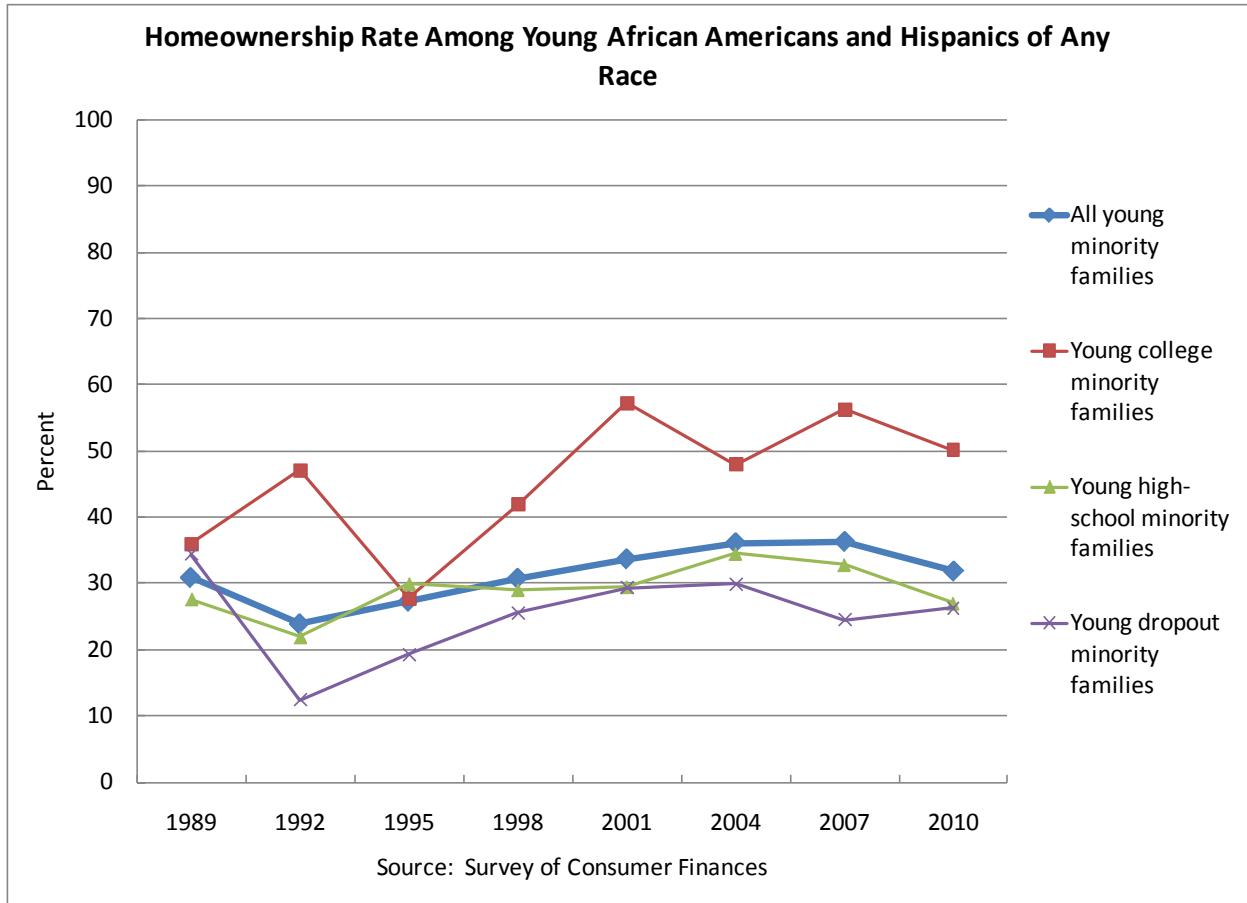


**FIGURE 7**

**Average DTA Ratios among All Families**

SOURCE: Survey of Consumer Finances.

**Figure 8**



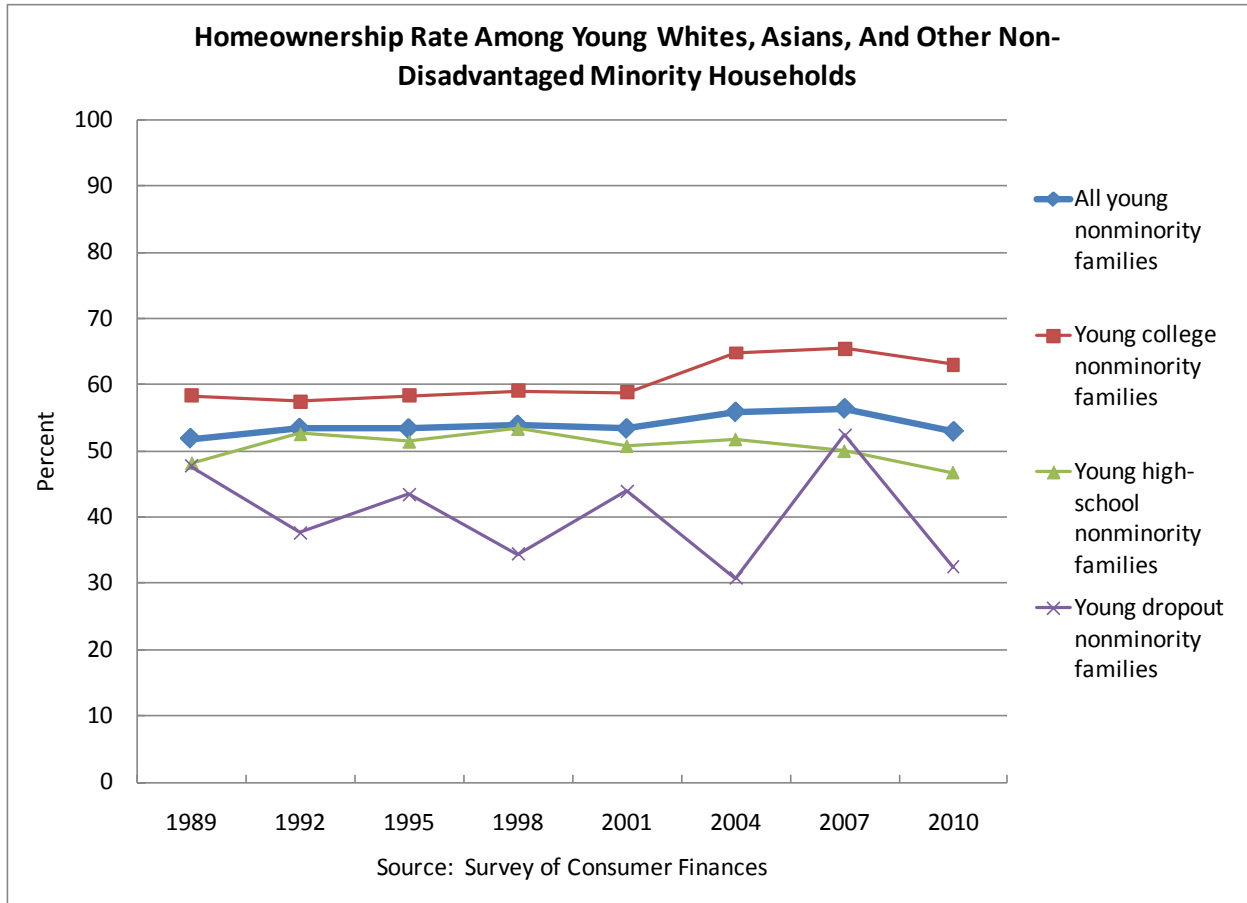
**FIGURE 8**

**Homeownership Rate among Young Historically Disadvantaged Minority Families**

NOTE: Historically disadvantaged minority includes African Americans and Hispanics of any race.

SOURCE: Survey of Consumer Finances.

**Figure 9**



**FIGURE 9**

**Homeownership Rate among Young Nonminority Families**

NOTE: Nonminority includes whites and non-disadvantaged minorities.

SOURCE: Survey of Consumer Finances.



**Figure 10**



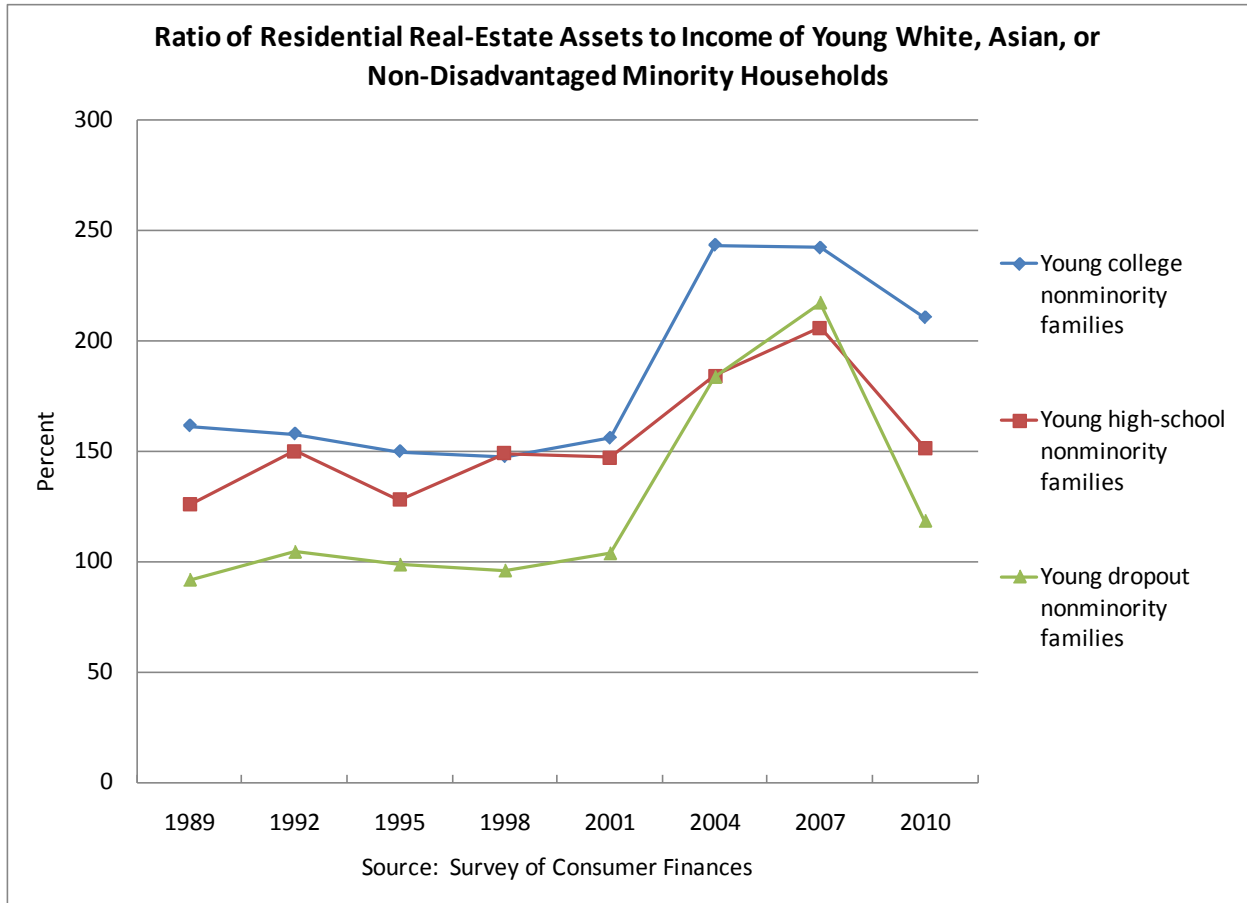
**FIGURE 10**

**Ratio of Residential Real Estate Assets to Income of Young Historically Disadvantaged Minority Families**

NOTE: Historically disadvantaged minority includes African Americans and Hispanics of any race.

SOURCE: Survey of Consumer Finances.

**Figure 11**



**FIGURE 11**

**Ratio of Residential Real Estate Assets to Income of Young Nonminority Families**

NOTE: Nonminority includes whites and non-disadvantaged minorities.

SOURCE: Survey of Consumer Finances.

Figure 12

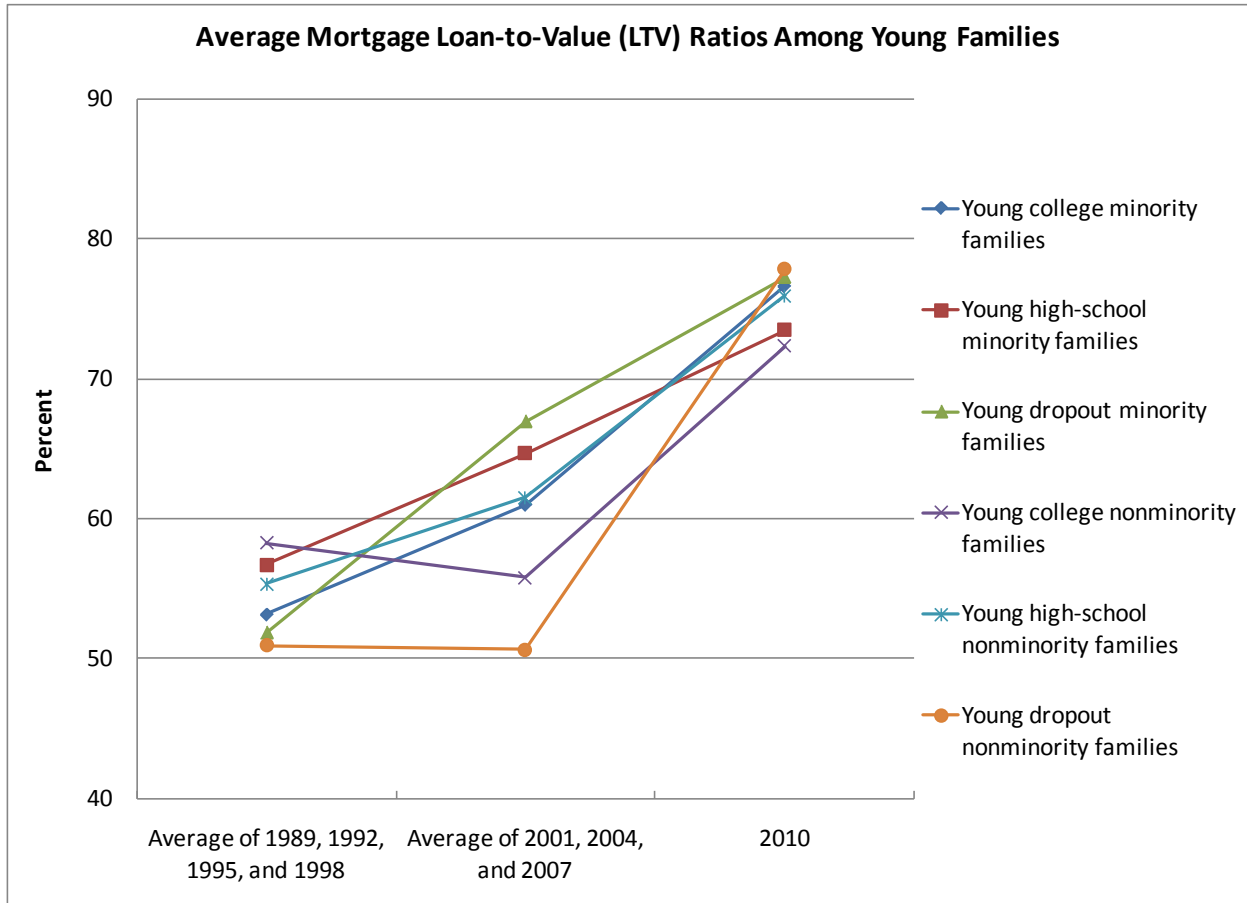


FIGURE 12

**Average LTV Ratios among Young Families**

NOTE: Historically disadvantaged minority includes African Americans and Hispanics of any race. Nonminority includes whites and non-disadvantaged minorities.

SOURCE: Survey of Consumer Finances.

**Table 1: Decomposition in Mean Inflation-Adjusted Net Worth (All Families, 2007-10)**

<b>All families</b>	<b>2007-10 Change (\$)</b>	<b>2007-10 Change (%)</b>	<b>Contribution to decline in net worth (%)</b>
<i>Changes in:</i>			
Durable goods	-1,338	-5.43	1.5
Financial and business assets	-40,301	-10.27	45.6
Residential real estate	-50,885	-18.99	57.5
Total assets	-92,525	-13.51	104.6
<i>Less changes in:</i>			
Non-mortgage debt	210	1.36	0.2
Mortgage debt	-4,271	-4.95	-4.8
Total liabilities	-4,061	-3.99	-4.6
<i>Equals:</i>			
Change in net worth	-88,464	-15.16	100.0

SOURCE: Survey of Consumer Finances.

**Table 2: Changes in Major Asset and Liability Categories by Age Group (2007-10)**

<b>Age of families</b>	<b>2007-10 Change (\$)</b>	<b>2007-10 Change (%)</b>	<b>Contribution to decline in net worth (%)</b>
<b><i>Old families (≥62 years)</i></b>			
<i>Changes in:</i>			
Durable goods	418	1.60	-0.5
Financial and business assets	-46,327	-7.73	49.9
Residential real estate	-36,721	-11.34	39.6
Total assets	-82,629	-8.71	89.1
<i>Less changes in:</i>			
Non-mortgage debt	-579	-6.88	-0.6
Mortgage debt	10,697	25.28	11.5
Total liabilities	10,118	19.95	10.9
<i>Equals:</i>			
Change in net worth	-92,748	-10.32	100.0
<b><i>Middle-aged families (40–61 years)</i></b>			
<i>Changes in:</i>			
Durable goods	-1,467	-5.22	1.2
Financial and business assets	-57,437	-12.00	47.1
Residential real estate	-64,819	-20.03	53.2
Total assets	-123,723	-14.90	101.5
<i>Less changes in:</i>			
Non-mortgage debt	1,560	9.17	1.3
Mortgage debt	-3,435	-3.04	-2.8
Total liabilities	-1,875	-1.44	-1.5

<i>Equals:</i>			
Change in net worth	-121,847	-17.40	100.0
<b>Young families(&lt;40 years)</b>			
<i>Changes in:</i>			
Durable goods	-3,074	-16.62	4.5
Financial and business assets	-31,596	-32.25	46.4
Residential real estate	-51,014	-35.85	74.9
Total assets	-85,685	-33.11	125.9
<i>Less changes in:</i>			
Non-mortgage debt	-570	-2.98	-0.8
Mortgage debt	-17,044	-20.18	-25.0
Total liabilities	-17,614	-17.00	-25.9
<i>Equals:</i>			
Change in net worth	-68,071	-43.87	100.0

SOURCE: Survey of Consumer Finances.

**Table 3: Logit Regressions of Homeownership Indicator Variable**

	<b>Dependent var. = 1 if family has resid'l real estate assets; 0 otherwise</b>	<b>Demographic vars. only</b>	<b>Idiosyncratic vars. only</b>	<b>All</b>
<b>Category</b>	<b>Independent variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
	Intercept	1.547***	0.831***	<b>1.563***</b>
Education	Less-than-high school dummy (High school or GED omitted)	-0.622***		<b>-0.608***</b>
Education	College grad dummy (High school or GED omitted)	0.831***		<b>0.655***</b>
Age	Age under 40 dummy (aged 40-61 omitted)	-1.677***		<b>-1.776***</b>
Age	Age 62 or older dummy (aged 40-61 omitted)	0.398***		<b>0.317***</b>
Race/ ethnicity	Member of historically disadvantaged minority dummy (white or Asian omitted)	-1.056***		<b>-1.095***</b>
Idiosync	Married deviation		0.740***	<b>0.805***</b>
Idiosync	Number of kids deviation (Normalized)		0.174***	<b>0.193***</b>
Idiosync	Square root of income deviation (Normalized)		0.837***	<b>0.814***</b>
Idiosync	Saved within the last year dummy deviation		0.331***	<b>0.354***</b>
Year	1995 Dummy (1992 omitted)	0.073	0.853***	<b>0.091</b>
Year	1998 Dummy (1992 omitted)	-0.135*	0.645***	<b>-0.123</b>
Year	2001 Dummy (1992 omitted)	-0.136*	0.661***	<b>-0.075</b>
Year	2004 Dummy (1992 omitted)	-0.064	0.721***	<b>0.006</b>
Year	2007 Dummy (1992 omitted)	-0.059	0.747***	<b>-0.035</b>
Young/yr	1995 Interacted with Young (1992 omitted)	0.054	-1.746***	<b>0.117</b>
Young/yr	1998 Interacted with Young (1992 omitted)	0.079	-1.795***	<b>0.119</b>
Young/yr	2001 Interacted with Young (1992 omitted)	0.136	-1.780***	<b>0.122</b>
Young/yr	2004 Interacted with Young (1992 omitted)	0.117	-1.771***	<b>0.129</b>
Young/yr	<b>2007 Interacted with Young (1992 omitted)</b>	0.263**	-1.640***	<b>0.334**</b>
	Number of observations	25889	25885	25885
Unweighted Regressions using RII techniques. *, **, and *** signify significance at .1, .05, and .01 levels, respectively. The deviation variables are deviations from weighted mean within the smallest demographic subgroup for age, race, and education level. Data from 1992-2007.				

**Table 4: Tobit Regressions of Residential Real Estate-to-Total Assets Ratio**

	<b>Dependent variable = Family's residential real estate-to-total assets ratio</b>	<b>Demographic vars. only</b>	<b>Idiosyncratic vars. only</b>	<b>All</b>
<b>Category</b>	<b>Independent variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
	Intercept	0.369***	0.286***	<b>0.375***</b>
Education	Less-than-high school dummy (High school or GED omitted)	-0.027***		<b>-0.030***</b>
Education	College grad dummy (High school or GED omitted)	-0.020***		<b>-0.020***</b>
Age	Age under 40 dummy (aged 40-61 omitted)	-0.191***		<b>-0.195***</b>
Age	Age 62 or older dummy (aged 40-61 omitted)	-0.006		<b>0.002</b>
Race/ ethnicity	Member of historically disadvantaged minority dummy (white or non-disadvant. minority omitted)	-0.125***		<b>-0.129***</b>
Idiosync	Married deviation		0.155***	<b>0.153***</b>
Idiosync	Number of kids deviation (Normalized)		0.036***	<b>0.037***</b>
Idiosync	Square root of income deviation (Normalized)		-0.011***	<b>-0.012***</b>
Idiosync	Saved within the last year dummy deviation		0.012**	<b>0.010</b>
Year	1995 Dummy (1992 omitted)	-0.003	0.054***	<b>-0.007</b>
Year	1998 Dummy (1992 omitted)	-0.030***	0.028**	<b>-0.031***</b>
Year	2001 Dummy (1992 omitted)	-0.036***	0.022*	<b>-0.035***</b>
Year	2004 Dummy (1992 omitted)	0.009	0.067***	<b>0.012</b>
Year	2007 Dummy (1992 omitted)	0.019*	0.076***	<b>0.017</b>
Young/yr	1995 Interacted with Young (1992 omitted)	0.021	-0.179***	<b>0.024</b>
Young/yr	1998 Interacted with Young (1992 omitted)	-0.017	-0.223***	<b>-0.014</b>
Young/yr	2001 Interacted with Young (1992 omitted)	0.005	-0.202***	<b>0.006</b>
Young/yr	2004 Interacted with Young (1992 omitted)	0.019	-0.192***	<b>0.017</b>
Young/yr	<b>2007 Interacted with Young (1992 omitted)</b>	0.041*	-0.167***	<b>0.047**</b>
	_ Sigma (parameter indicating whether Tobit is needed)	0.422***	0.413***	<b>0.411***</b>
	Observations	25889	25885	25885
	Censored	6728	6728	6728
Unweighted Regressions using RII techniques. *, **, and *** signify significance at .1, .05, and .01 levels, respectively. Deviations from weighted mean within the smallest demographic subgroup for age, race, and education level. Data from 1992 to 2007.				



**Table 5: Tobit Regressions of Debt-to-Assets Ratio**

<b>Dependent variable = Family's debt-to-assets ratio</b>	<b>Demographic vars. only</b>	<b>Idiosyncratic vars. only</b>	<b>All</b>
<b>Independent variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
Intercept	0.142***	0.175***	<b>0.173***</b>
Less-than-high school dummy (High school or GED omitted)	-0.070***		<b>-0.076***</b>
College grad dummy (High school or GED omitted)	-0.053***		<b>-0.033***</b>
Age under 40 dummy (aged 40-61 omitted)	0.368***		<b>0.347***</b>
Age 62 or older dummy (aged 40-61 omitted)	-0.428***		<b>-0.405***</b>
Member of historically disadvantaged minority dummy (white or Asian omitted)	0.100***		<b>0.087***</b>
Married deviation		-0.007	<b>0.000</b>
Number of kids deviation (Normalized)		0.028***	<b>0.023***</b>
Square root of income deviation (Normalized)		-0.026***	<b>-0.020***</b>
Saved within the last year dummy deviation		-0.164***	<b>-0.167***</b>
1995 Dummy	0.031	-0.120***	<b>0.031</b>
1998 Dummy	0.023	-0.114***	<b>0.022</b>
2001 Dummy	0.009	-0.131***	<b>0.001</b>
2004 Dummy	0.068***	-0.061***	<b>0.069***</b>
2007 Dummy	0.076***	-0.067***	<b>0.075***</b>
1995 Interacted with Young	-0.051	0.441***	<b>-0.054</b>
1998 Interacted with Young	0.012	0.495***	<b>0.013</b>
2001 Interacted with Young	-0.006	0.481***	<b>-0.000</b>
2004 Interacted with Young	-0.036	0.439***	<b>-0.041</b>
<b>2007 Interacted with Young</b>	0.048	0.542***	<b>0.047</b>
_Sigma (parameter indicating whether Tobit is needed)	0.754***	0.759***	0.745***
Observations	25115	25111	25111
Censored	6371	6369	6369
Unweighted Regressions using RII techniques. *, **, and *** signify significance at .1, .05, and .01 levels, respectively. Deviations from weighted mean within the smallest demographic subgroup for age, race, and education level. Observations with DTA>10 omitted. Data from 1992-2007.			

**Table 6: Panel Regression of Indicator Variable for Any Delinquency of at Least Two Months within Year before Re-interview in 2009 on Data from SCF Panel, 2007-09**

<b>Independent variables observed in 2007</b>	<b>Co-efficient estimates</b>
Intercept	-2.176***
High school or GED dummy (< high school omitted)	-0.235
College graduate dummy (< high school omitted)	-0.671**
Age < 40 dummy (ages 40-61 years omitted)	-0.064
Age ≥ 62 dummy (ages 40-61 years omitted)	-0.547
Member of historically disadvantaged minority dummy (white or non-disadvantaged minority omitted)	0.102
Square root of income	0.013**
Saved within the past year dummy	-0.418**
Married dummy	-0.071
No. of children in household	0.132**
Square root of liquid assets	-0.002***
Square root of available credit	-0.004***
DTI ratio	0.081***
History of past credit problems	0.783***
Homeowner	-0.593***
Mortgage LTV ratio	1.023***
Unemployment spell in 2008-09 (observed 2009)	0.687***
Sickness in 2008-09 (observed 2009)	-0.207
Observations (First Implicate)	2801

NOTE: Unweighted regressions using repeated-imputation inference techniques (See Montalto and Sung, 1996). \*, \*\*, and \*\*\* indicate statistical significance at the 10 percent, 5 percent, and 1 percent confidence levels, respectively. SOURCE: Data from 2007-09 panel SCF survey.

## NOTES

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<sup>1</sup> Data are from the Federal Reserve's Survey of Consumer Finances, conducted in its current form triennially since 1989. The latest wave available was from 2010; the next survey wave will be conducted during 2013. All amounts listed are in 2010 inflation-adjusted dollars.

<sup>2</sup> A short sale is a home sale for less than the value of all outstanding mortgage debt. Like a default, a short sale requires the homeowner to give up the house and it wipes out the mortgage debt. A principal reduction involves the forgiveness of some mortgage debt without loss of the home. All three transactions damage the borrower's credit rating but increase the borrower's net worth because the value of debt being extinguished exceeds the value of the assets surrendered—the house in case of short sale or default; nothing in a principal reduction. All three transactions normally create taxable income to the borrower in the amount of the “deficiency”, in case of default or short sale, or debt forgiveness. The Mortgage Forgiveness Debt Relief Act of 2007 (and its extensions) exempted borrowers from taxation on their cancelled debts during calendar years 2007 through 2013.

<sup>3</sup> See Bricker et al. (2012) and Emmons and Noeth (2012a) for detailed discussions of recent findings in the SCF.

<sup>4</sup> Our decision to define groups with cutoffs at 40 and 62 years of age reflects a number of considerations. To maintain roughly equal group sizes over the entire study period, on average, an upper cutoff of about 55 years would have been better. However, our focus in this article is on homeownership, which suggested an upper cutoff age in the upper 60s or even 70, the point in the life cycle when the homeownership rate appears to stabilize. Our choice of age 62 represents a compromise, also motivated in part by the fact that 62 is the age at which Social Security benefits are first available. A large movement out of employment occurs at about this age.

<sup>5</sup> U.S. Census Bureau.

<sup>6</sup> Flavin and Yamashita (2002) analyze the effect of a family's exogenously determined housing portfolio share on the composition of its optimal portfolio of financial assets and its choice of leverage. They note the empirical fact but do not explain why younger families typically have higher housing portfolio shares than do unconstrained (wealthier and usually older) families. The elevated housing share and accompanying high leverage (both relative to net worth) create a risky portfolio. Flavin and Yamashita show that, regardless of the degree of a family's risk aversion, its optimal portfolio share invested in stocks increases and its housing portfolio share decreases over the life cycle as wealth increases. Younger families hold more housing and bonds but fewer stocks because this asset mix reduces overall portfolio risk given an exogenously imposed large portfolio share of housing. Hence, young families hold suboptimal portfolios by assumption, which they gradually shift toward more desirable, less-housing-intensive, and less-levered portfolios as they age and accumulate wealth.

<sup>7</sup> Piazzesi, Schneider, and Tuzel (2007) study asset pricing in a model that includes housing. They use a representative-agent general equilibrium framework with complete financial markets, frictionless markets for owner-occupied and rental housing, and no borrowing constraints. Thus, all agents hold the same portfolio shares at a given time and there are no life cycle considerations. The representative agent never holds a suboptimal portfolio while consuming housing and nonhousing goods and services because it is costless to shift between rental and owner-occupied housing and to vary the share of housing and nonhousing consumption.

<sup>8</sup> One possible explanation for greater mortgage borrowing by older homeowners is that the age distribution of those 62 years of age and older has changed. However, the share of those 60 to 74 years of age (the “young old”) in the population 60 years of age and older has been increasing rapidly only since 2000; therefore, this explanation cannot explain why the increase began in the early 1990s. A second potential explanation is that older homeowners increasingly have used the equity in their homes to collateralize borrowing for other purposes. This appears to be an important factor that may have combined with a rising share of young old families and rising house values in the 2000s.

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<sup>9</sup> See Emmons and Noeth (2013) for a detailed discussion of mortgage borrowing between 2000 and 2012 across age groups and in birth-year cohorts.

<sup>10</sup> In other unpublished work that attempts to reconcile data from the SCF with aggregate financial data in the Federal Reserve's flow of funds accounts, we found evidence suggesting the LTV ratios reported in the SCF may be lower and less volatile than actual ratios, on average. Possible misreporting of various items in the survey is not a major concern in this article unless there are systematic biases across different age, education, or racial and ethnic groups, for which we have no evidence.

<sup>11</sup> See Paoli (2012). A private estimate of the share of homeowners younger than 40 years of age with mortgage debt that exceeds the market value of the house securing it was 48 percent in the second quarter of 2012, compared with a rate of about 31 percent among all homeowners with mortgage debt.

<sup>12</sup> The only notable exception to this general rule is that middle-aged and older households with less than a high school education appear, along some dimensions, to be more like highly educated young households than more highly educated households closer to their own age. One way to think about this is that, on average, almost all young households appear "poor" in the sense of being financially constrained, while only those families with less than a high school education appear "poor," on average, when they are older than 40 years of age.

<sup>13</sup> The ranges for middle-aged and older nonminority households of all educational levels in 2007 were 54 to 87 percent and 75 to 90 percent, respectively. The ranges of minority homeownership rates for middle-aged and older households were 50 to 77 percent and 50 to 80 percent, respectively.

<sup>14</sup> Cell sizes are as small as 27 observations for households headed by minority college graduates younger than 40 years of age in 1989. Thus, sampling variability is an important consideration when interpreting these results. In general, smaller sample sizes are associated with more irregular time-series patterns in the figures.

<sup>15</sup> The regressions reported here are somewhat different than those reported in Emmons and Noeth, 2013a. The results are qualitatively unchanged. The primary differences are: 1) we have added results for regressions of housing portfolio shares, shown in this paper's Table 4; 2) we estimated Tobit regressions for housing portfolio shares and debt-to-assets ratios, rather than using OLS, shown in this paper's Tables 4 and 5; and 3) for the idiosyncratic variables in Tables 3, 4, and 5, we used deviations from sub-group means in this paper, rather than the actual values of the variables.

<sup>16</sup> Emmons and Noeth (2013c).