



## Mortgaging Household and Global Financial Stability: To What End?

### ABSTRACT

Debt-financed housing was central to the recent financial crisis and subsequent Great Recession. Millions of leveraged homeowners lost trillions of dollars of wealth and the global financial system nearly collapsed. Our system of highly leveraged homeownership therefore deserves critical scrutiny. At the household level, three key features are involved: 1) A widespread preference and policy support for ownership over renting; 2) External financing exclusively in terms of debt (rather than equity); and 3) A relatively high amount of leverage, especially among *ex ante* financially vulnerable families. The collapse of the housing market proved to be profoundly damaging for many of these families. At the macro level, boom-bust housing cycles have been at least partially inflated by government policies of three types: 1) Tax preferences for owner occupation and debt financing among other policies; 2) An asymmetric monetary policy reaction known as the “Fed put,” which supported a private-sector debt buildup; and 3) Financial liberalization, which contributed to large housing bubbles and financial instability by increasing typical loan-to-value ratios. Despite clear links between highly leveraged homeownership and severe financial crises, little serious discussion of changing our housing-finance system has taken place. As a first step, we discuss modifications to the tax code that could support alternatives to leveraged homeownership.

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## **Mortgaging Household and Global Financial Stability: To What End?**

Demand for a new investment bubble began months ago, when the subprime mortgage bubble burst and left the business world without a suitable source of pretend income....

"Every American family deserves a false sense of security," said Chris Reppto, a risk analyst for Citigroup in New York. "Once we have a bubble to provide a fragile foundation, we can begin building pyramid scheme on top of pyramid scheme, and before we know it, the financial situation will return to normal."

*The Onion*, "Recession-Plagued Nation Demands New Bubble to Invest In," July 14, 2008.

The bursting of debt-fueled housing bubbles in the United States and many other countries a decade ago triggered the most severe financial crisis since the Great Depression (and possibly ever) as well as the deepest recession in the United States since World War II.<sup>1</sup> As many as 10 million U.S. households involuntarily exited homeownership and trillions of dollars of wealth evaporated. Vulnerable groups of families, including young people, those with less than a four-year college degree and non-whites, were hit even harder than average and have, in many cases, failed to recover fully even after a decade of post-recession economic expansion. In light of these massive costs, it is reasonable to ask what goals our system of highly leveraged homeownership was designed to achieve, both at the micro (household) and macro (economy-wide) levels.

Is a goal to increase homeownership? In fact, homeownership today is no more prevalent as a share of households than it was in 1969, the year before the first mortgage-backed security was created.

Is a goal to help households build wealth, especially those from disadvantaged backgrounds? In fact, housing wealth has grown more slowly than other forms of wealth over

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<sup>1</sup> In November 2009, Federal Reserve Chairman Ben Bernanke testified to the Financial Crisis Inquiry Commission that, "As a scholar of the Great Depression, I honestly believe that September and October 2008 was the worst financial crisis in history, including the Great Depression." See Da Costa (2014), in which a court filing related to AIG contained the quote.

decades. Wealth inequality has increased. Millions of vulnerable families with disproportionate amounts of their limited wealth invested in housing were financially devastated by the bursting housing bubble.

Is a goal to stabilize the economy by encouraging the steady construction of new and resale of existing single-family housing capital, financed by forced household saving in the form of long-term amortizing mortgages? In fact, the housing sector adds volatility to the economy and, when housing bubbles here and abroad burst a decade ago, the global financial system was shaken almost to the point of collapse.

In short, it is difficult to portray the panoply of U.S. policies that promote leveraged homeownership as a broad-based success either at the micro or the macro level. Of course, many narrowly defined interests—homebuilders, mortgage bankers, realtors, entrenched “homevoters,” and the politicians who are financed by them—may have been served well.<sup>2</sup> But these housing-related special interests do not equate to the national interest.

Warning signs were present in the run-up to the financial crisis but were largely ignored or explained away. These included:

- An increase in the aggregate ratio of household debt to disposable personal income of two thirds between 1987 and 2007 (from 82 to 138 percent), while the mortgage-debt-to-income ratio almost doubled (from 53 to 101 percent);<sup>3</sup>
- An increase in the median household debt-to-income ratio from 23 percent in 1989 to 60 percent by 2007;<sup>4</sup> and
- An increase in the annual standard deviation of aggregate real household net worth by half between the 1958-87 and 1988-2017 periods, from 3.7 to 5.6 percent.<sup>5</sup>

Yet after the crisis had occurred, most homeowners, lenders, investors and policymakers apparently were taken by surprise, blaming bad luck or a “corrupt financial elite” rather than the system of leveraged homeownership itself. Even the Financial Crisis Inquiry

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<sup>2</sup> See Fischel (2001), who proposed the “homevoter hypothesis” to explain how homeowners systematically influence local governments to serve their own interests and exclude others.

<sup>3</sup> Federal Reserve Financial Accounts of the United States.

<sup>4</sup> Federal Reserve Survey of Consumer Finances. This includes all families, not just those with debt.

<sup>5</sup> Authors’ calculations from Federal Reserve Financial Accounts of the United States.

Commission (FCIC), to take one prominent example, concluded *not* that highly leveraged homeownership and the tangled web of government policies, incentives and subsidies surrounding it were in any way to blame for the boom and bust. Instead, individual FCIC members pointed fingers at particular “bad actors” in the financial system, including the credit rating agencies, the government-sponsored enterprises, the Federal Reserve, etc.

Have leveraged housing bubbles become normal and perhaps even necessary for economic growth? Despite some tightening of lending standards by surviving mortgage lenders and investors (for example, higher required borrower credit scores and fully verified income) and new underwriting restrictions imposed by the Dodd-Frank Act, the basic outlines of our low down-payment mortgage finance system are little changed from the pre-bubble period.<sup>6</sup> Indeed, the median mortgage loan-to-value ratio at origination actually was higher in September 2018 than it was before the financial crisis.<sup>7</sup> In sum, the epicenter of the worldwide crisis—highly leveraged U.S. homeownership combined with a hybrid private/public secondary mortgage market—has survived the crisis essentially intact.

We pose and briefly discuss several questions about highly leveraged homeownership in this paper:

- How did the U.S. system of highly leveraged homeownership arise?
- Why are so many *ex ante* financially vulnerable families drawn into highly leveraged homeownership and what are their typical outcomes?
- Do government policies—including tax, zoning, monetary and financial policies—create and/or exacerbate boom-bust housing cycles?
- What is the future of leveraged homeownership in the U.S.?

The paper is organized as follows. The first section provides a brief history of mortgage financing of homeownership in the U.S. Section 2 highlights the role of three key structural

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<sup>6</sup> When mortgage lenders refer to “low down payments” they typically mean under 5 percent of the home value, or an original loan-to-value (LTV) ratio of 95 percent or more. We use the term low down payment to mean a down payment of 20 percent or less or an LTV of 80 percent or more.

<sup>7</sup> See Urban Institute, “Combined LTV at Origination,” *Housing Finance at a Glance: A Monthly Chartbook*, September 2018, p. 17. This refers to owner-occupied purchase loans only.

features of many households that can jointly produce highly leveraged homeownership, namely:

- A strong desire by most families to own a home as early in adult life as possible;
- Low wealth early in life (and throughout life for many families); and
- Limited information available to potential investors or lenders about a potential homeowner's other assets, ability to earn income and her incentive to meet all of her obligations (including timely repayment of funds advanced and adequate maintenance of the property).

Together, these features are capable of creating highly leveraged homeownership; without any of them, a different system likely would emerge. In this section, we use data from the Survey of Consumer Finances to show that some groups of financially vulnerable families—younger, less educated, non-white—were severely negatively affected by the increased financialization (i.e., greater leverage) of homeownership in recent decades.

Section 3 explores the recent macroeconomic literature that analyzes leveraged bubbles, especially housing bubbles. The contributory roles of government policies are of special interest. The final section concludes with some discussion of the future of financialized homeownership.

## **I. From Antiquity to Wall Street: How Did the U. S. System of Highly Leveraged Homeownership Arise?**

According to Robert Shiller, mortgage debt appeared in the Tang dynasty in China (618-907). In the Western world, ancient Greek and Roman mortgages were based on principles in Talmudic law. The French word mortgage appeared in English usage in 1283, according to the Oxford English Dictionary.

Fast-forwarding to the 20<sup>th</sup> century, pre-Depression non-farm mortgages in the U.S. typically were 5- or 10-year “bullet” or “balloon” loans made by banks, insurance companies or other lenders with initial loan-to-value ratios of 50 percent or less. According to some accounts, most of these loans were not completely amortizing, which required the borrower to

refinance at maturity.<sup>8</sup> Fewer than half of households were homeowners before World War II, with the 50-percent mark being surpassed only in the post-war period.

***Government mortgage-related institutions.*** The policy response to massive mortgage problems during the Great Depression—as much as 40 percent of mortgages were delinquent at the worst point—included an alphabet soup of new government institutions, many of which endure today:

- Federal Home Loan Bank System (FHLB, 1932)
- Homeowners Loan Corporation (HOLC, 1933)
- Federal Deposit Insurance Corporation and Federal Savings and Loan Insurance Corporation (FDIC and FSLIC, 1933)
- Farm Credit System (FCS, 1933)
- Federal Housing Administration (FHA, 1934)
- Federal National Mortgage Association (Fannie Mae, 1938)

Notable mortgage-related institutions that arrived later include:

- Veterans Administration Home Loans (VAHL, 1944)
- National Flood Insurance Program (NFIP, 1968)
- Government National Mortgage Association (Ginnie Mae, 1968)
- Federal Home Loan Mortgage Corporation (Freddie Mac, 1970)
- Rural Housing Service (RHS, 1990)

From a financial perspective, these government institutions augmented private mortgage lending and risk-bearing capacity by increasing secondary-market liquidity and on-balance-sheet funding options; diversifying, reducing or even eliminating lenders' loan-default risk; and creating what has become the industry standard—a long-term, fixed-rate, level-payment, self-amortizing, pre-payable, government-backed mortgage.

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<sup>8</sup> See Herndon (2018). However, Grebler, Blank and Winnick (1956) provide data from 1925-29 that show some mortgages were fully amortized. (Thanks to Paul Willen for identifying this near-contemporary source.)

As important as the innovation and standardization in the mortgage instrument and mortgage markets were, these new institutions also partially socialized mortgage default risk—especially catastrophic risk like that experienced during the Great Depression and, once again, during the Great Recession. As we learned during and after the recent crisis, the true extent of government guarantees of private risk turned out to be far greater than was explicitly acknowledged before the crisis.

Additional federal interventions into mortgage lending after the Great Depression that departed from a strict economic or financial purpose include:

- Home Mortgage Disclosure Act (HMDA, 1975)
- Community Reinvestment Act (CRA, 1977)
- Affordable Housing Goals for Fannie Mae and Freddie Mac (1992)
- Home Ownership and Equity Protection Act (HOEPA, 1994)
- OCC pre-emption of state anti-predatory lending laws (2004)

***The secondary market and securitization.*** The modern development of a large and active secondary market for home mortgages is an extremely important event that combined government and private efforts and incentives.<sup>9</sup> Important Depression-era government institutions that liquefied mortgage originators' balance sheets included Fannie Mae and the HOLC. The HOLC created the now standard long-term (initially 15 years) self-amortizing fixed-rate mortgage as a distress work-out tool. Extending the loan term allowed lower monthly payments, offset in part by principal amortization that was designed to eliminate refinancing risk upon maturity. In other words, long-term mortgages—like much else in the government's response to the Great Depression—presumably were not seen at the time as a permanent part of the housing-finance system.<sup>10</sup>

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<sup>9</sup> See Herndon (2018) for a discussion of earlier, unsuccessful attempts to establish mortgage securitization. Gerardi, Rosen and Willen (2010) show that securitization beginning in the 1980s had first-order effects not just on mortgage and housing markets but also on the economy as a whole. In other words, they believe securitization reshaped mortgage markets and raised economic growth.

<sup>10</sup> See Wheelock (2008).

A mortgage pass-through security is a type of mortgage-backed security (MBS) created by pooling mortgages and issuing certificates to investors which provide a claim on a portion of the flow of payments. Pass-through MBS were first issued by Ginnie Mae in 1970; Freddie Mac (1971) and Fannie Mae (1982) followed suit. Privately issued collateralized mortgage obligations (CMOs), created by pooling and tranching (grouping based on their risk profiles) government-backed MBS, appeared in 1983. Complex re-securitization of government-backed MBS and the securitization and re-securitization of non-government guaranteed mortgages and asset-backed securities (ABS) reached its apogee in the 2000s. Issuance of non-conforming (i.e., not eligible for securitization by the GSEs) jumbo prime, subprime and Alt-A mortgages reached \$1.5 trillion in 2006.<sup>11</sup> Meanwhile, metro-area house-price futures and futures options began trading on the Chicago Mercantile Exchange in 2006. Over-the-counter credit-default swaps (CDS) written on ABS and CDO indexes proliferated among global financial institutions until the financial crisis. Michael Lewis dramatized the use, abuse and collapse of the mortgage CDS market in his book and movie, *The Big Short*.

These and other important changes to supervision and regulation of mortgage lending—such as preferential risk weights for portfolios of retained home mortgages under bank risk-based capital standards—combined to create the world’s largest home-mortgage market, reaching \$10.6 trillion in outstanding balances in early 2009, equivalent to 74 percent of GDP.<sup>12</sup> As of mid-2018, the mortgage market had declined to the equivalent of 50 percent of GDP (\$10.2 trillion). This represents a significant deleveraging of household balance sheets, but the ratio remains higher than at any time before 2001.

## II. **Risky Foundations: Why are So Many Financially Vulnerable Families Drawn into Highly Leveraged Homeownership?**

The micro- or household-level analogue of the macroeconomic developments of the last three decades include higher and more volatile asset prices and wealth as well as much higher

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<sup>11</sup> See SIFMA website.

<sup>12</sup> Federal Reserve Financial Accounts of the United States.



levels of household debt, especially mortgage debt (all relative to household income or GDP). Even today, a decade after the financial crisis, household debt levels and mortgage delinquency rates remain elevated, markers of continuing financial fragility.<sup>13</sup>

Heightened financial instability is especially prevalent among groups of *ex ante* financially vulnerable families. These include young, less-educated and/or non-white families. These groups' homeownership rates and median wealth soared as the housing bubble inflated, only to plunge after it burst. Recovery remains incomplete for many.

After providing some quantitative context to our discussion of housing finance and an outline of the structural features of many households that underlie our system of highly leveraged homeownership, we use data from the Federal Reserve Board's Survey of Consumer Finances to illustrate some of the consequences of the latest wave in the financialization of homeownership for financially vulnerable families.

***How important are houses and mortgages?*** Houses are the most valuable asset owned by the majority of families that have any wealth. In 2007, 69 percent of households owned a home.<sup>14</sup> For the average American family in 2007, the principle residence represented 41 percent of total assets. Meanwhile, mortgage financing was and remains today the largest category of household debt by far in terms of dollar amount owed. In 2007, mortgage debt was equivalent to 90 percent of household income, on average; all other debt combined was equivalent to only 27 percent of income. Among homeowners in that year, 71 percent owed some mortgage debt.

One consequence of leveraged homeownership on the scale seen in 2007 was extreme vulnerability to a large house-price decline and deep recession. When these occurred in tandem, widespread household financial instability ensued. In fact, the collapse of millions of families' balance sheets rocked financial markets and the economy, resulting in an epic global financial crisis and near-repeat of the Great Depression.<sup>15</sup> The hardest hit families were those

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<sup>13</sup> For delinquency rates, see Mortgage Bankers Association.

<sup>14</sup> All figures are from the Federal Reserve Board's Survey of Consumer Finances. The homeownership rate reported by the Census Bureau was lower in that year.

<sup>15</sup> See Mian and Sufi (2014, 2016) for strong evidence that deterioration of household balance sheets severely harmed the economy through local employment effects.

known to be vulnerable. For example, pre-crash evidence clearly pointed to high risks posed by homeownership to minority and low-income families.<sup>16</sup>

This may seem obvious in hindsight, but it was far from obvious before 2008 that such a scenario was even possible, let alone likely. First of all, there were strong private-sector incentives to keep the housing and mortgage markets going, alongside extensive oversight and regulation of financial institutions and markets. At the same time, the socialization of large downside housing and mortgage risks provided a substantial shock absorber. How could a massive collapse have happened?

A few numbers illustrate the scale and consequences of highly leveraged homeownership gone wrong. The share of families that were seriously delinquent on some debt doubled between 1992 and 2010 (both post-recession years), from 4 to 8 percent; even in 2016, the serious-delinquency rate remained at 6 percent. As many as one out of every five or six home owning families left homeownership involuntarily. The loss of household wealth was widespread and massive, although some of the post-crash decline surely represented deflation of an unsustainable bubble in housing values that overstated pre-crash wealth in some sense. Median family wealth declined about 40 percent, from roughly \$140,000 in 2007 to \$84,000 in 2013 (both expressed in terms of 2016 purchasing power).

***Why highly leveraged homeownership?*** From a microeconomic perspective, research has focused on these features of the U.S. leveraged homeownership system (among others):

- Rent vs. own: Most families prefer owning to renting
- Debt vs. equity: If a homeowner requires external financing, it is almost always in the form of debt, not equity or another type of risk-sharing financial instrument

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<sup>16</sup> Turner and Smith (2009) find that African-American, Hispanic and low-income families were more likely to exit homeownership than white and high-income families between 1999 and 2005, even before the crash. Emmons (2017) shows with Survey of Consumer Finances data through 2016 that the long-run average rate of housing wealth accumulation has lagged for African-American homeowners even though all other wealth owned by black families grew no slower than population averages.

- Leverage: The typical initial loan-to-value ratio is relatively high, usually at least 80 percent and currently near 90 percent<sup>17</sup>
- Loan term: The original maturities and amortization schedules of almost all first-lien mortgages are long-term (15 or more years, most commonly 30 years)
- Interest rate: The interest rate usually is fixed for the term of the loan
- Nominal vs. real or other principal-indexing method: Both principal and periodic payments usually are fixed in nominal terms; aside from short-term interest rates in some cases, the principal is never indexed to an economic variable that could facilitate hedging and risk-sharing, such as inflation, house prices or incomes<sup>18</sup>
- Collateral: The mortgage loan is secured by the property being financed with (but in some states without) recourse to other assets of the borrower
- Amortization: The loan is amortized to create level payments in nominal terms
- Default risk: The risk of mortgage default is shared by lenders, private insurers and government
- Mortgage funding: Mortgages may be held on the originator’s balance sheet, sold or securitized for sale to investors

In our judgment, the key features are the first three listed above: Why is there a strong preference to own? Why is unindexed debt used rather than equity or some other type of risk-sharing instrument? Why is leverage typically so high? The other dimensions also are worthy of study but we believe the critical vulnerabilities associated with leveraged homeownership are captured by these three elements.

**Rent vs own.** Surveys consistently reveal a strong preference for owning over renting throughout the population. Not surprisingly, individuals mention a myriad of underlying motivations for this preference, most of them vague and impressionistic rather than a reflection of a cold financial calculation of risks, costs and benefits.<sup>19</sup> To represent this

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<sup>17</sup> See Urban Institute (2018).

<sup>18</sup> Denmark is a country in which mortgages always can be refinanced if lower interest rates are available even if a borrower falls into negative equity, greatly reducing default risk. See Berg, Nielsen and Vickery (2018) and Badarinza, Campbell and Ramadorai (2016).

<sup>19</sup> See Opportunity Agenda (2011) or periodic polling on attitudes toward housing (for example, Gallup or Pew). A 2013 Gallup poll question—“What are some of the reasons why you decided to own your

overwhelming preference, most economic models essentially *assume* this outcome. Iacoviello and Pavan (2013) simply state that families “gain utility” when becoming homeowners. Sommer, Sullivan and Verbrugge (2013) posit in a tenure-choice housing model that all families prefer to own rather than rent due to tax, housing quality and perhaps other reasons. Kiyotaki, Michaelides and Nikolov (2011) assume that homeownership is preferred because it allows modifications to be made to the housing unit. Chambers, Garriga and Schlagenhaut (2009) is an exception to the “just assume it” approach, analyzing income-tax incentives for owner occupation, which began in the Civil War era.

But even if tax incentives can be shown to induce a strong preference for owning, the point we wish to make remains. Economists struggle (or don’t even try) to explain why owning is preferred to renting among most families, even those with weak financial situations. As Piazzesi and Schneider (2016) point out, this is problematic for our understanding of homeownership because owning a single house with a big mortgage is a risky proposition with possibly dire financial consequences, as we learned all too well in the recent crisis.

***Debt vs. equity.*** There are a few basic reasons why debt is preferred to equity by homeowners in most housing models. Because virtually everyone prefers to own (by assumption), young and other poor families must find outside funds to make a purchase. In current circumstances, that means debt. A second reason debt may be preferred is that it confers tax advantages to some borrowers. These benefits are heavily skewed toward borrowers with higher incomes and tax rates, a point that is both obvious and entirely contrary to the stated intent of public policy toward homeownership. Home-secured debt also may be the only or the cheapest type of debt a household could access to finance a portfolio of assets other than the house itself, although Willen and Kubler (2006) argue that the gains from financing equity investments this way, for example, are likely to be very small for low-wealth households.

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home rather than rent?”—elicited the following responses, in descending order of frequency: An investment/Appreciate in value; Believe in owning/Have always owned; Build equity/credit; Smarter thing to do/Don't want to throw away money; Cheaper/More cost effective/Better deal; Don't want to pay rent/Live in a rental/Pay others; Financial security/Stability; For the family/Our home; Freedom/Able to do what I want; Pride of ownership; Tax deductions; Location/Nice area/Private; More space/comfort/convenience; Can afford to own; Inherited/Gift; The American Dream.

From the lender's perspective, debt is efficient because it deals with adverse selection and moral hazard relatively well. Debt is a "hard claim" that requires relatively low monitoring and is relatively easy to enforce in the legal system. When combined with a collateral requirement, it protects the lender against unwittingly engaging with an unreliable borrower. An equity or other risk-sharing contract is inherently more ambiguous, hard to enforce (except perhaps in the case of fraud) and subject to hold-up or renegotiation threats by the homeowner. Thus, while a debt contract is not perfect (what economists call "first-best optimal"), it may be "second best," or optimal given unavoidable constraints on information flows, and therefore preferred to a shared-equity arrangement.

**High leverage.** The fact that the desire to own is widespread and strong; because debt is the preferred financing contract; and because most first-time homebuyers are relatively poor, high loan-to-value ratios at origination result.<sup>20</sup> Mortgage lenders are willing to extend high-LTV loans because they perceive well-underwritten mortgage loans to be low risk and, with the reassurance of a federal-government backstop for catastrophic risk, their downside risk is limited.

**Are we missing something about bubbles?** Can bubbles ever be a good thing? In addition to being fodder for satirists like those at *The Onion*, the view that bubbles can be beneficial receives some justification in a few economic models. Miao and Wang (2018) describe a model in which a stock-market bubble is welfare-enhancing because it constitutes valuable collateral, loosening firms' credit constraints at least temporarily. The investments they are able to make could raise the economy's productive capacity permanently. Analogously, elevated house prices can do the same thing for families, providing extra homeowners' equity that can be "extracted."<sup>21</sup> While it lasts, a housing bubble can be both popular and useful to many firms, small business owners and homeowners.

Of course, when the bubble bursts, there are negative consequences—a recession in the Miao and Wang economy and higher consumer default risk in Bhutta and Keys' data because

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<sup>20</sup> See Piazzesi and Schneider (2016) for a theoretical exploration of portfolio choice across the life cycle, including housing and mortgage decisions.

<sup>21</sup> See Bhutta and Keys (2016).

home-equity borrowers tend to spend the money on current consumption or illiquid investments.

***The recent experiences of three groups of vulnerable families.*** The 2007-13 declines in homeownership and median net worth were worse among some groups than the overall trends might indicate. To illustrate, we focus on a group of young families—in particular, those headed by someone born in the 1970s (i.e., 1970 through 1979). Between 2007 and 2013, family heads in this group were moving from their late twenties and early thirties to their mid-thirties and early forties. In other words, one would expect these families to be moving into homeownership in large numbers and to be accumulating wealth relatively rapidly.

We compare the six-year decline of this smaller group of young families to the trajectory we would expect based on the full sample of families of all ages observed in many different years. To do this, we estimated typical life cycles for homeownership and wealth accumulation based on almost 48,000 families observed once each in one of the ten waves of the Survey of Consumer Finances (SCF; triennially from 1989 to 2016).<sup>22</sup> We removed the fixed effects common to all families associated with the year in which the family was surveyed, giving us a “pure” life-cycle estimate using 1989 as the base year.

The median age of family heads in the 1970s cohort in 2007 was 33 years old; in 2013, it was 39 years. We predicted a homeownership rate of 51 percent at age 33 and a rate of 64 percent at age 39, both based on the entire SCF sample. The median net worth we predicted at age 33 was about \$40,200, with median net worth of about \$73,900 at age 39 (both dollar figures are expressed in terms of 2016 purchasing power).

Taking into account these predictable changes in homeownership rates and typical wealth as the cohort ages, we find evidence of substantial financial damage to the 1970s cohort overall and to several of its subgroups. Compared to the full-sample predicted life-cycle trajectories, the following deviations occurred between 2007 and 2013 among the groups noted:

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<sup>22</sup> See Emmons, Kent and Ricketts (2018) for more discussion of generational trends in income and wealth.

- All families born in the 1970s: The homeownership rate declined 12 percentage points relative to the predicted life-cycle trajectory, while median net worth declined 47 percentage points relative to the predicted trajectory (see Figures 1 and 2);<sup>23</sup>
- Families born in the 1970s headed by someone without a four-year college degree: Homeownership rate declined 16 percentage points, median net worth declined 31 percentage points (see Figures 3 and 4);
- Black family heads born in the 1970s: Homeownership declined 15 percentage points, median net worth declined 13 percentage points (see Figures 5 and 6);<sup>24</sup>
- Hispanic family heads born in the 1970s: Homeownership declined 21 percentage points, median net worth declined 35 percentage points (see Figures 5 and 6).

For many families in these groups, a substantial contributor to their declining wealth was highly leveraged homeownership. Indeed, the Fed estimates from aggregate household-sector data that homeowners' equity declined by almost 60 percent in real terms from peak (\$6.727 trillion in Q1.2006) to trough (\$2.730 trillion in Q2.2011), even though the total value of household real estate declined "only" 38 percent from peak to trough (\$11.362 trillion in Q1.2006 to \$7.089 trillion in Q4.2011).<sup>25</sup> Economic, social and political upheaval followed in the wake of this disaster and, in some respects, the turmoil continues to this day—especially for families most severely affected.

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<sup>23</sup> To be clear, the homeownership rate of this cohort (median age 33) was 60 percent in 2007, and was 61 percent in 2013 (median age 39), an increase of one percentage point. The 1970s cohort therefore went from being 9 percentage points above the predicted level at age 33 to 3 percentage points below the predicted rate at age 39, a relative decline of 12 percentage points. Similarly, median net worth of the 1970s cohort was 4 percent above the predicted level at age 33 in 2007, falling to 43 percent below the predicted level at age 39 in 2013. Actual median net worth of this cohort increased slightly between 2007 and 2013, from \$41,900 to \$42,400.

<sup>24</sup> The declines between 2004 and 2013 for black families born in the 1970s were 15 and 50 percent, respectively.

<sup>25</sup> Federal Reserve Financial Accounts of the United States. Nominal values are deflated by the Consumer Price Index. The greater proportional losses in home equity are due to leverage, which magnifies changes in real-estate values.

Although homeownership rates for these groups were temporarily boosted during the housing bubble—as noted, the homeownership rate of the entire 1970s birth cohort was 9 percentage points above the predicted level in 2007, at median age 33—, the subsequent crash left them below the trajectories we would expect in many cases. Even worse, elevated debt-to-income levels taken on during the boom remained very high after the crash and severe-delinquency rates remained elevated through 2016, 10 years after the housing bubble peaked. In particular:

- The 1970s cohort’s mean debt-to-income ratio in 2007 was 75 percentage points higher than predicted and, in 2016, it still was 43 percentage points higher than predicted for that age (42 years old; see Figure 9);
- The share of families with a serious delinquency (any payment 60 days or more past due) was above the expected level at every age we observed, remaining 1.8 percentage points higher than expected at age 42 in 2016 (see Figure 10).

As described above, median net worth of these groups fell substantially below the levels one would predict at their ages based on the experiences of other SCF families observed over time. Thus, highly leveraged homeownership was associated with deteriorating financial stability of many of the most vulnerable households.

Of course, not all 1970s groups fared equally poorly. Families headed by a white four-year college graduate were hit by the crash but have recovered more strongly than the vulnerable groups highlighted above. (See Figures 7 and 8.) Homeownership has plateaued since 2007, but remains very close to the level we predicted for the group at age 42. Median net worth has increased rapidly after the initial setback suffered in 2010, again leaving the median member of this group very close to the level we predicted. Thus, while white college graduates born in the 1970s suffered from the crisis, there is no lasting damage evident in their homeownership or median net-worth positions as of 2016. This is starkly at variance with families headed by non-college graduates, African Americans and Hispanics of the same age. For them, the imprint of the financial crisis remains quite visible even in 2016.



### III. Leveraged Bubbles: Do Government Policies Create or Exacerbate Boom-Bust Housing Cycles?

Debt-fueled asset-price booms are not new nor are they unique to the U.S., of course. Jorda, Schularick and Taylor (2015) provide a historical and international survey of what they term leveraged bubbles, primarily in housing. Drawing on a new dataset from 17 countries over a period of 140 years, covering equity markets, house prices and bank lending, they find the most damaging asset bubbles are credit-financed housing bubbles. Likewise, Lombardi, Mohanty and Shim (2017) use data from 54 countries since 1990 to document positive short-run but negative long-run growth consequences of increased household borrowing, most of which is mortgage debt.<sup>26</sup>

The essential ingredients for creating a leveraged bubble are rapidly rising asset prices and strong credit growth that is used to finance the escalating value of transactions. There is an active debate in economics focused on whether asset bubbles precede rapid credit growth or exogenous shocks to credit growth or collateral constraints spur asset bubbles, especially with reference to the recent crisis.<sup>27</sup>

Pinpointing the direction of initial causation is not critical for our discussion here. In any case, we share the eclectic view expressed by Piazzesi and Schneider (2016):

[T]he nature of the shock that started the housing boom is [still] not well understood. Changes in housing preferences, expectations, foreign capital inflows or down-payment constraints are essentially stand-ins for changes in various market participants' attitudes towards housing and housing credit. To understand what generates these changes requires theories of expectation formation, financial innovation as well as international capital-market integration (p. 1628).

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<sup>26</sup> Emmons (2018) shows that countries with high homeownership rates in 2005 experienced large subsequent declines in growth.

<sup>27</sup> See Guerrieri and Uhlig (2016) or Piazzesi and Schneider (2016) for overviews of the debate. See Foote, Gerardi and Willen (2012) for the case, based on "twelve facts about the mortgage market," that optimistic beliefs about rising house prices preceded and, in an important sense, caused rapid mortgage credit growth to follow. Justiniano, Primiceri and Tambalotti (2015) match empirical evidence to a calibrated model in which rising house prices spur a lending boom through increased collateral values. Mian, Sufi and Verner (2017) and the references therein present evidence for the opposing view—that a credit supply shock instigated the housing bubble.

Once a credit-fueled housing bubble is underway, its ultimate source matters little. Moreover, because we believe there is scope for policy actions (or inaction) to prevent overly optimistic beliefs about house prices from forming and there also are financial policies that can slow credit growth, both putative sources of bubbles should be pursued and, ideally, prevented.

We discuss three types of government policies that may create or exacerbate boom-bust housing cycles:

- Micro policies: Tax, zoning and foreclosure/bankruptcy rules, notably recourse rules;
- Monetary policy: Including both interest-rate management and crisis-management tools; and
- Financial policies: Mortgage-market structure and financial liberalization.

**Micro policies.** Perhaps the primary way government policies create or exacerbate housing bubbles is through extensive micro-level interventions. Tax preferences for owner occupation and debt financing are part of the income-tax code. In addition, local zoning, land-use, licensure, rent-control, eminent-domain and other regulations exert significant influences on housing. As Rosen (1985) states, “The American housing market is subject to a mind-boggling array of government interventions by various levels of government.”

These policies affect not just housing demand but also housing supply. The stock of built housing in the United States, consisting primarily of detached single-family units rather than multi-family units, as in some countries, reflects not just geography and preferences but also policies.

A typical research finding is that, due to the regressive income-tax preference for debt, homeowners buy bigger houses and take on larger mortgages than they otherwise would. In fact, a complete elimination of the mortgage interest deduction might be expected to result in all of the following changes, some of which run counter to conventional wisdom:<sup>28</sup>

- Five percentage-point increase in the homeownership rate;
- Roughly four percent decline in average house prices, with larger price declines for more expensive houses and smaller price declines for cheaper houses;
- More than 30 percent decline in the average mortgage balance; and

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<sup>28</sup> See Sommer and Sullivan (2018).

- Negligible change in rents, although landlords' profitability would decline.

Recourse—that is, the legal right of a lender to pursue a defaulting mortgage borrower's other assets—is a potentially important contract feature that lowers *ex ante* default risk but can, if not independently controlled, increase equilibrium loan-to-value ratios.<sup>29</sup> Not all mortgage defaults in so-called recourse states result in a lender pursuing a legal judgment against the borrower's other assets, however, because the process is expensive and some defaulters have few assets to pursue or they are difficult to seize. The bottom line is that, compared to many European countries, the U.S. has a relatively lax system of recourse (i.e., seldom enforced) which, all else equal, results in higher default and foreclosure rates.

Given the panoply of complex and interacting micro-level government policies affecting housing demand, as well as the path dependence of a housing capital stock that has been skewed toward owner occupation for many decades, it is not at all clear how an “undistorted” housing market would look. If this hypothetical market consisted of more renter households and fewer owner-occupiers and, among the owners, more equity finance and less debt, then the complete set of policies we have now constitutes a first, important way that government policies have helped to create and exacerbate housing bubbles. As noted above, the preference of many Americans for owner occupation influences government policies while, at the same time, the existence of these policies shapes individual actions. Separating preferences from policies, in other words, is not an easy task.

**Monetary policy.** The 1987 stock-market crash and its economically benign aftermath convinced many that, contrary to the emerging “efficient-markets/rational-expectations” paradigm in mainstream economic and financial theories at the time, asset bubbles—or at least highly volatile asset prices that are difficult to reconcile with movements in fundamentals—really can exist in a modern economy. Meanwhile, Federal Reserve Chairman Alan Greenspan's vigorous—and apparently successful—policy response to the crash laid the groundwork for an

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<sup>29</sup> See Hatchondo, Martinez and Sanchez (2015). The National Consumer Law Center classifies these ten states as non-recourse states: Alaska, Arizona, California, Hawaii, Minnesota, Montana, North Dakota, Oklahoma, Oregon and Washington.

asymmetric monetary-policy reaction function that became known colloquially as the “Greenspan put.”<sup>30</sup>

In effect, the Fed would not resist or lean against rapid credit growth or asset-price appreciation unless faster consumer-price inflation also threatened. Conversely, if credit growth or asset prices crashed, the Fed would quickly slash interest rates and keep them low for an extended period. This “mopping-up” strategy seemed to work again after the IT-driven stock-market bubble burst in 2000.

Greenspan’s successors followed the same game plan after the housing bubble burst.<sup>31</sup> This approach, in turn, may have contributed to lower average real interest rates and the creation of a “debt trap”—a buildup of private- and public-sector debt that greatly raises the cost of tightening monetary policy. The debt overhang then validates market expectations of low average interest rates in the future and spurs yet another boom-bust cycle.<sup>32</sup>

Another important aspect of monetary policy that had been rarely used in the decades before the financial crisis is lender-of-last-resort (LLR) policy. In contrast to the Fed put, which immediately affects the entire economy, LLR policy is directed at individual institutions or markets. Students of LLR policy throughout history have warned of the cumulative build-up of risk-increasing moral hazard that results from rescues of individual banks, such as Continental Illinois or, in the early stages of the financial crisis, Bear Stearns. These precedents probably

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<sup>30</sup> See Dahiya, Kamrad, Poti and Siddique (2017) and the large, active literature on the “Fed put” referenced therein. For a policymaker’s view, see “Market Bailouts and the ‘Fed Put’”, by William Poole (2008), who was president of the St. Louis Fed at the time his article appeared. Although he believed many people misunderstood what the Fed was doing, Poole stated, “There is a sense in which a Fed put exists.”

<sup>31</sup> Barlevi (2018) describes the “lean vs. clean” policy debate that has developed since the 1990s. Even today, the Fed’s rationale for cleaning up after rather than leaning against bubbles as they form is best captured in Ben Bernanke’s Jackson Hole paper delivered before he joined the Fed; see Bernanke and Gertler (1999). A more sophisticated version of the argument that advocates inflation targeting rather than leaning against bubbles is in Gali (2017). Subsequent Fed chairs (Janet Yellen and Jerome Powell) have given no indication that they have a preference for leaning over cleaning.

<sup>32</sup> See Borio, Disyatat and Rungcharoenkitkul (2018) for an analysis of destabilizing monetary policy when the policymaker ignores what they call the “financial cycle.” They gauge the financial cycle with measures of credit growth and levels and changes in real house prices. In the authors’ view, the Fed is at the center of a new global monetary-policy regime that generates asset bubbles and busts because they focus only on inflation and the business cycle.

contributed to the disruption unleashed by the Lehman Bros. failure, because market participants had expected it to be rescued, as well.<sup>33</sup>

Perhaps least important among the major aspects of monetary policy as a cause of housing bubbles is the systematic, business-cycle focused manipulation of short-term interest rates.<sup>34</sup> This is largely because the interest rate that matters most for housing—the long-term real interest rate—is set in global financial markets, not by the Fed, except for brief periods.

Some models assign a major role to low real long-term interest rates in driving up house prices—for example, Himmelberg, Mayer and Sinai (2005); Sommer, Sullivan and Verbrugge (2013); and Kiyotaki, Michaelides and Nikolov (2011)—but others find little net effect on house prices due to foreign capital inflows (the presumptive cause of low real rates), including Favilukis, Ludvigson and Van Nieuwerburgh (2017). A post-crisis fact that undermines the hypothesis that interest rates were the driving force in the housing bubble is that post-crisis interest rates are even lower, but—with a few exceptions like Canada, Australia and Norway—housing bubbles in most countries burst long ago. If low long-term real interest rates were the main cause of high house prices, these prices should be even higher now than a decade ago. In any case, the role of central banks in determining the long-term real interest rate likely is small.<sup>35</sup>

**Financial policies.** The financial policies that have received the most attention in connection with leveraged homeownership are mortgage-market structure and mortgage-underwriting standards. Both are influenced, although not completely determined by, government policies.

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<sup>33</sup> See Gorton (2010).

<sup>34</sup> Taylor (2013) represents a minority view among economists that the Fed's medium-term interest-rate actions were a major contributor to the housing bubble and collapse. Perhaps unsurprisingly, he believes strict adherence to the Taylor Rule would have prevented the crisis.

<sup>35</sup> An exception to this view is Borio, Disyatat and Rungcharoenkitkul (2018), who believe central banks, and especially the Fed, exert a persistent influence on the economy and the real interest rate. By allowing debt-fueled bubbles to form and burst, the Fed inadvertently creates a larger and larger debt overhang that makes higher policy rates more costly and, hence, less likely to be maintained. This lowers the average real interest rate over time as the central bank repeatedly slashes interest rates to clean up after another bursting bubble.

The roles of market structure in the primary (i.e., mortgage origination) and secondary (i.e., mortgage sale and securitization) mortgage markets have been overshadowed by financial liberalization of mortgage underwriting, to which we turn below. Important research into topics like predatory mortgage lending<sup>36</sup> and the broader importance of securitization<sup>37</sup> was completed during the housing boom itself. But the dramatic ensuing events of the housing bust, the financial crisis and the Great Recession have obscured those topics, at least for now.

One of the themes of the current paper is that the underpinnings of our system of highly leveraged homeownership—including effective (or ineffective) competition, consumer protection and the functioning of the secondary mortgage market—are important in any discussion of reform. It is unfortunate that they have received comparatively little attention recently. For example, what to do with Fannie Mae and Freddie Mac—the giant housing Government Sponsored Enterprises that have been in a “short-term” conservatorship for over ten years—remains an unresolved question despite its significance. By default, catastrophic risk in the U.S. mortgage market has been nationalized. Despite the fact that Fannie and Freddie have disappeared from the front page, their fate is central to the future of highly leveraged homeownership. Without the GSE credit backstop for 30-year fixed-rate mortgages, it is unlikely that the private sector alone could or would provide a reasonably priced substitute. Like apple pie and the Fourth of July, the 30-year fixed-rate, freely pre-payable mortgage is uniquely American.

Meanwhile, a near-consensus has developed among economists that financial liberalization—including lax mortgage underwriting and low collateral requirements (i.e., very high permissible loan-to-value (LTV) ratios at origination) was at the heart of the recent housing bubble. In most unified treatments of the housing boom and bust, the reason the bubble burst was a reversal of financial liberalization. That is, it did not end due to Fed tightening of monetary policy; a reversal of global capital flows; new legislation (Dodd-Frank); the onset of a recession emanating from other sectors; etc. The only disagreement is about how financial liberalization happened in the first place—organically in the private sector or via government

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<sup>36</sup> See Bond, Musto and Yilmaz (2009).

<sup>37</sup> See Gerardi, Rosen and Willen (2010).

policies; mainly in the form of laxer underwriting or higher permissible LTVs at origination—and exactly how and when it reversed.

As noted above, there is disagreement among economists about how important low long-term real interest rates (more precisely—large autonomous foreign capital inflows) were for inflating house prices. Disagreements about financial liberalization are more nuanced. Virtually all models find that higher LTV ratios resulted in (temporarily) higher homeownership rates because, often by assumption, virtually all households want to be homeowners but some were prevented by lack of a sufficient down payment.<sup>38</sup> Lowering the bar allowed more to jump over it.

Unfortunately, these new homeowners were—almost by definition—financially weaker to begin with (they were marginal, after all). It was precisely these families who then were most likely to crash out of homeownership when the bubble burst.

Whether financial liberalization also resulted in much higher house prices depends on the model. For example, Sommer, Sullivan, and Verbrugge (2013) say no; Favilukis, Ludvigson and Van Nieuwerburgh (2017) say yes. Conclusive evidence on this point awaits further research.

#### **IV. The Future of Highly Leveraged Homeownership: Is There Another Way?**

Across OECD countries, those with higher homeownership rates before the crisis experienced bigger declines in economic growth during its aftermath, suggesting that a high-homeownership policy may not be growth-enhancing.<sup>39</sup> Because mortgage indebtedness remains high for many homeowners, they remain quite vulnerable to another large house-price decline. Fuster, Guttman-Kenney and Haughwout (2018) provide state-level summary results of stress tests performed on individual homeowners' equity positions in the face of several severe house-price decline scenarios. According to their estimates, as of early 2017, only three percent of homeowners with mortgages had combined loan-to-value (CLTV) ratios of 100 percent or

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<sup>38</sup> See, for example, Kiyotaki, Michaelides and Nikolov (2011), Iacoviello and Pavan (2013), Sommer, Sullivan and Verbrugge (2013), and Favilukis, Ludvigson and Van Nieuwerburgh (2017).

<sup>39</sup> See Emmons (2018). The U.S. ranks near the OECD sample median in both pre-crisis homeownership rate and post-crash growth slowdown.

more—i.e., zero or negative homeowners' equity. If house-price declines of the same magnitude as the recent peak-to-trough drops in each county were to occur now, about 38 percent of homeowners would fall into negative equity. The rate of serious delinquency (90+ days past due) would more than double, from 4.2 percent to 9.9 percent of homeowners. Although not as high as the worst levels seen in 2010-11, this would be comparable to the level of mortgage distress present in 2009.

Yet the appeal of homeownership remains undiminished, not least among some of the most vulnerable families:

Homeownership plays a unique role among racial and ethnic minorities, according to the October 2010 report by The Opportunity Agenda on the economic recovery. The meta-analysis of public opinion found that non-Hispanic white adults associate the American Dream primarily with freedom and financial security, whereas African Americans, Latinos, other non-whites, and recent immigrants define it mostly in terms of concrete indicators of, or means of achieving, economic well-being, citing homeownership, a good job, and wealth itself as important components of the Dream. (The Opportunity Agenda, 2011).

Perhaps we have no choice. Homeownership is desired by almost all adults, government policies remain firmly supportive and Fed policies may have inadvertently raised the likelihood of future cycles of bubbles and busts. Summers (2014) argues that increased financial volatility and recurring asset bubbles have become a feature of the “new economic normal” created by chronically low interest rates. He describes our likely medium-term economic future as an environment of “secular stagnation.”

If we are destined to experience more housing bubbles, tax policies could be designed to take advantage of them. Joseph Stiglitz (2015) presents a model of land and credit in which land bubbles naturally occur. He shows that a modern version of Henry George's land-value tax (1879) can lead to higher average incomes and lower wealth inequality. Presumably the tax would tend to dampen the magnitude of the bubbles, too. Yet this long-standing economic argument for taxing land-based bubbles instead of or in addition to taxing income appears to have little political support.



We should at least use the recent traumatic experience to re-examine the importance we place on homeownership and the role high leverage plays in supporting it. Providing more support for rental housing—perhaps in addition to the substantial budget directed at owner occupation, rather than instead of it —could ease the disappointment of families who might not become homeowners until age 50 when previous generations entered at age 35. Reducing the tax preference for debt would be a step in the right direction, too.

The most basic question of all is, how should the government intervene, if at all?

A related question is whether the government should promote homeownership in the first place, given that it involves a large undiversified investment and potential welfare costs in default. (Piazzesi and Schneider, 2016, p. 1628).

If our ultimate goals are durable and widespread household and global financial stability—not leveraged homeownership *per se*—everything should be on the table.

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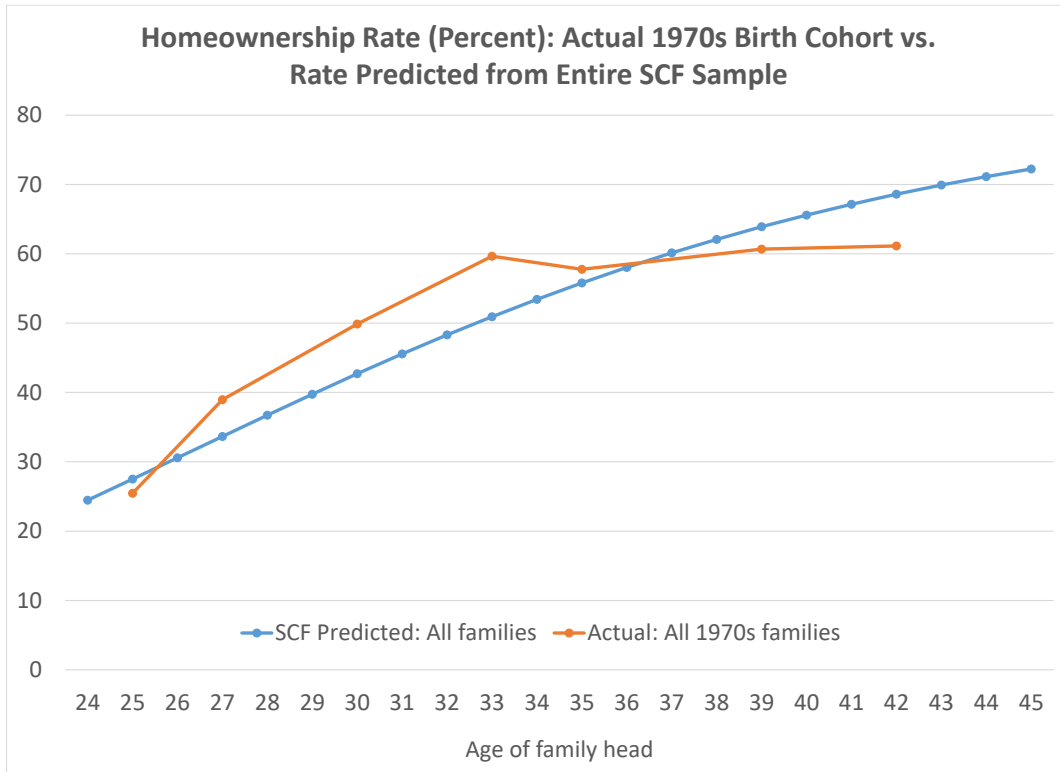
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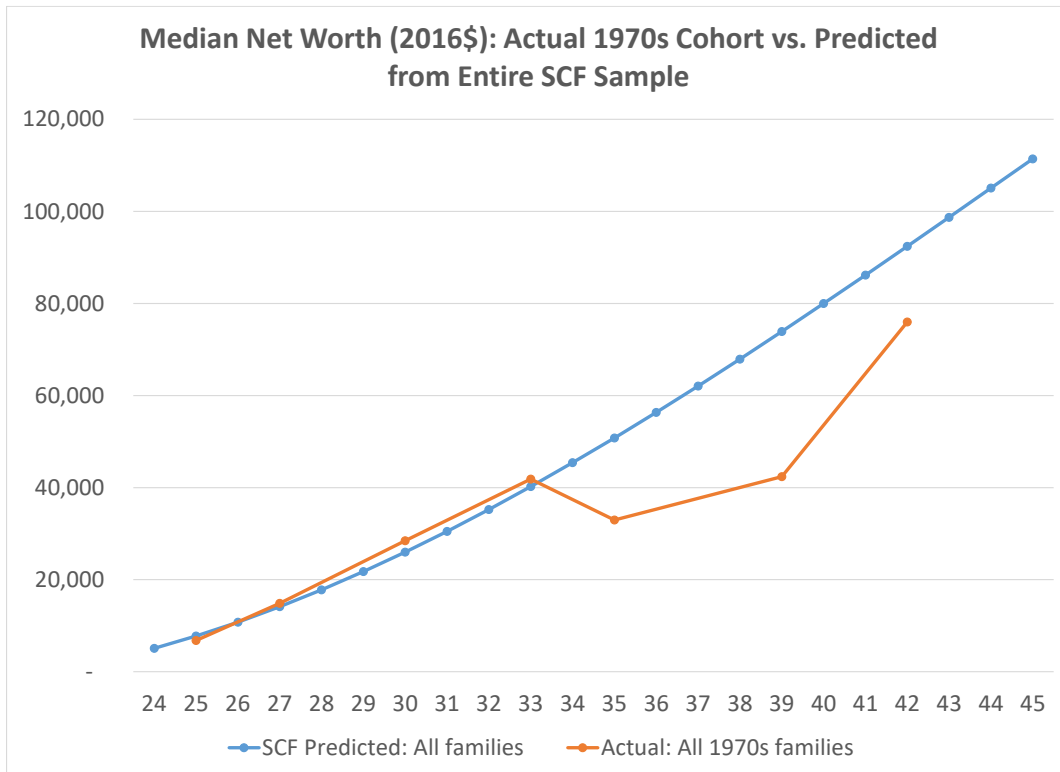
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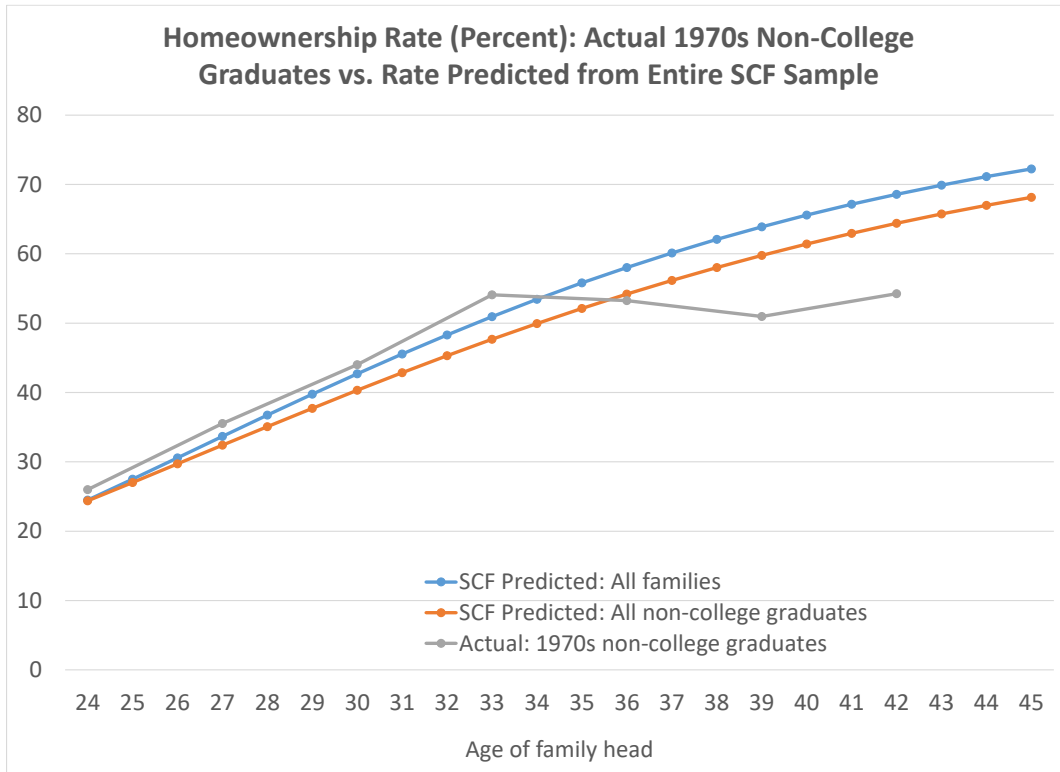
**Figure 1**



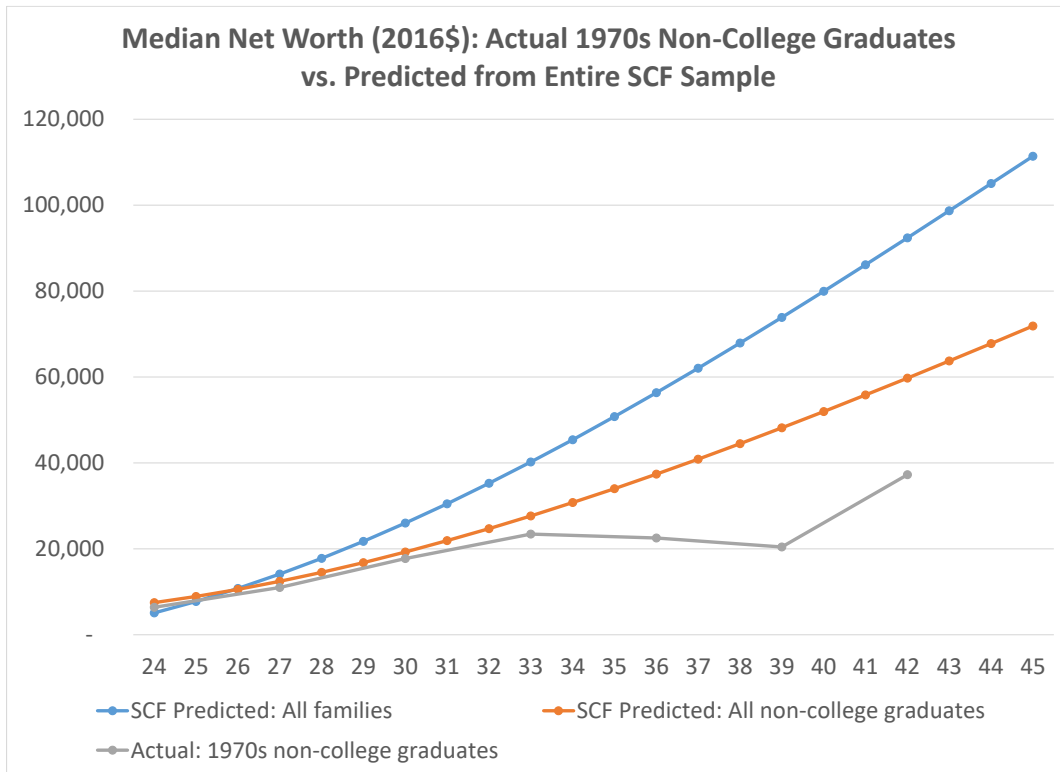
**Figure 2**



**Figure 3**

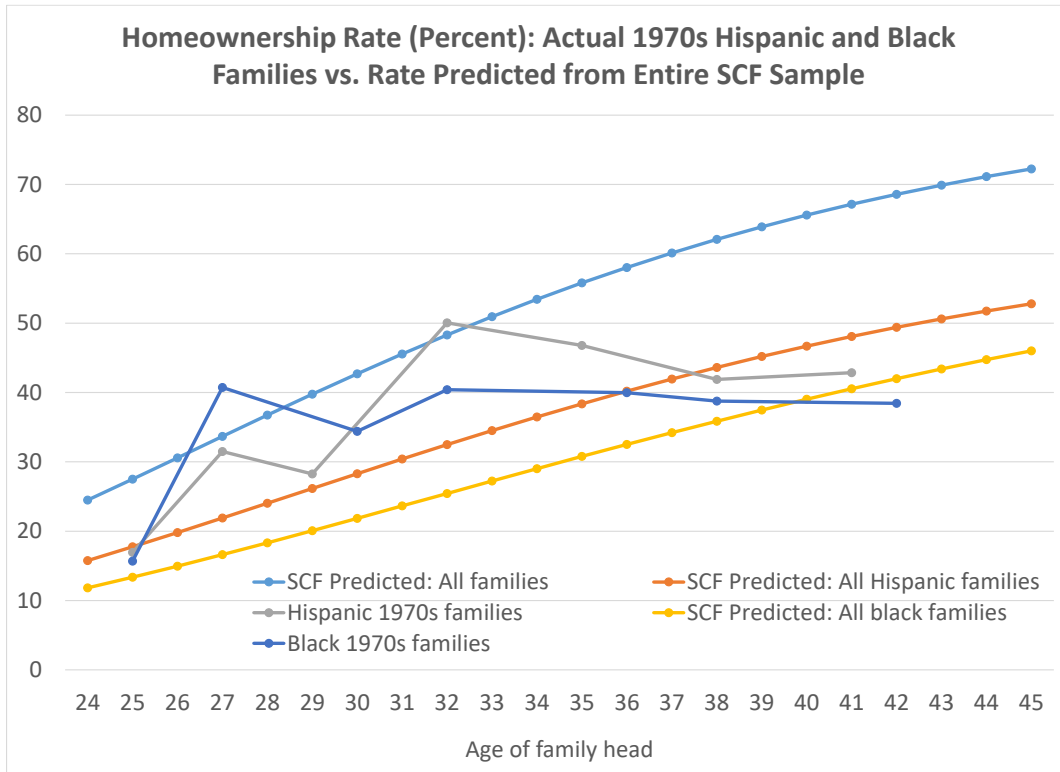


**Figure 4**

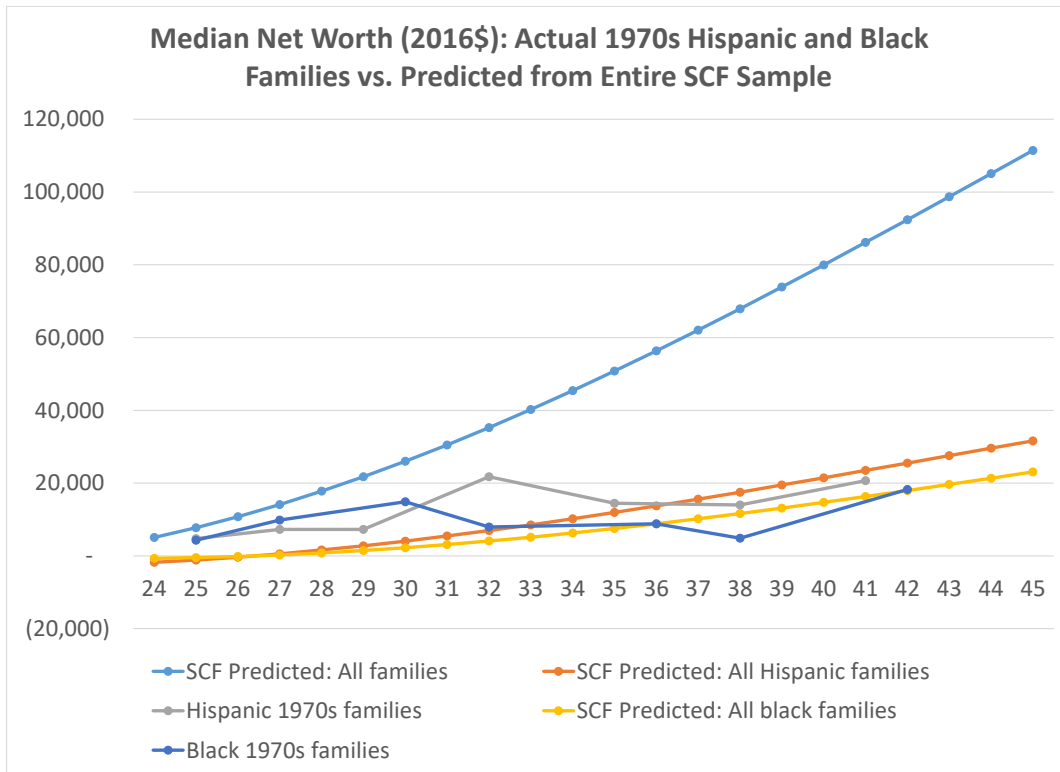




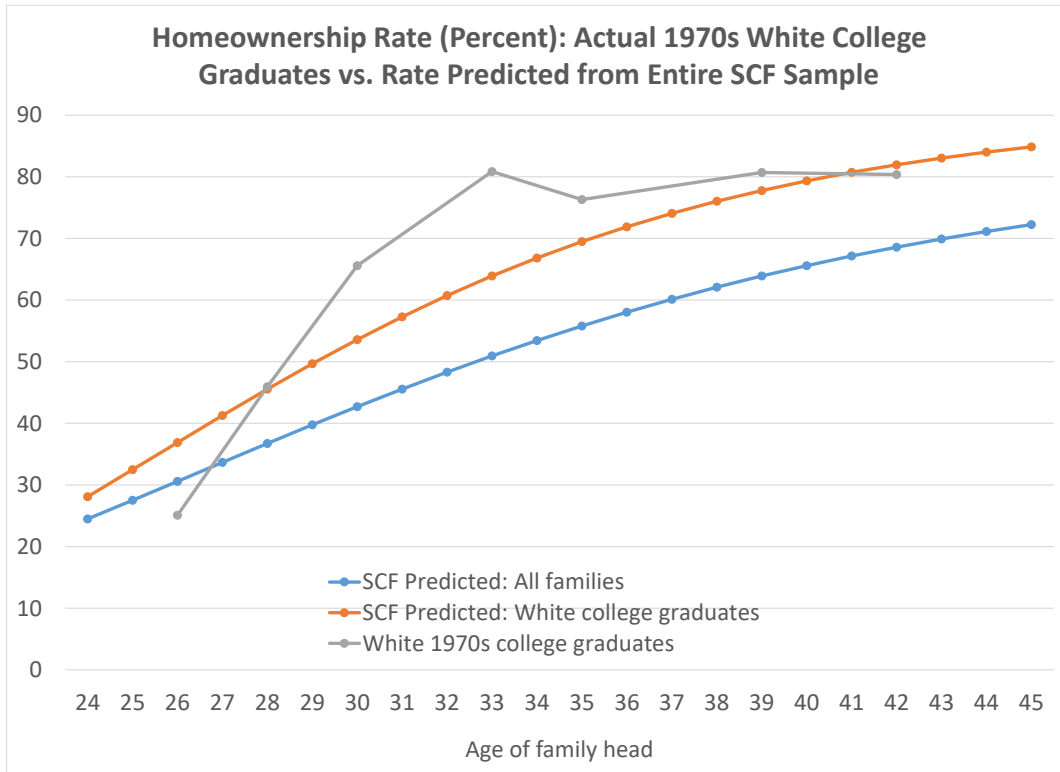
**Figure 5**



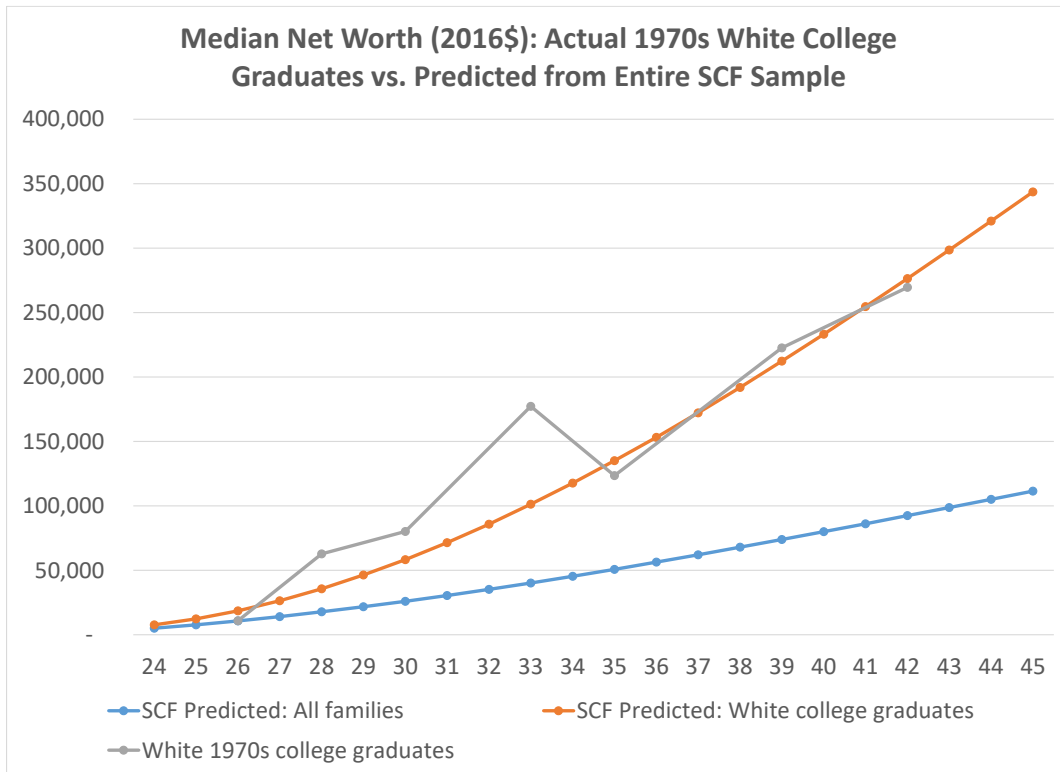
**Figure 6**



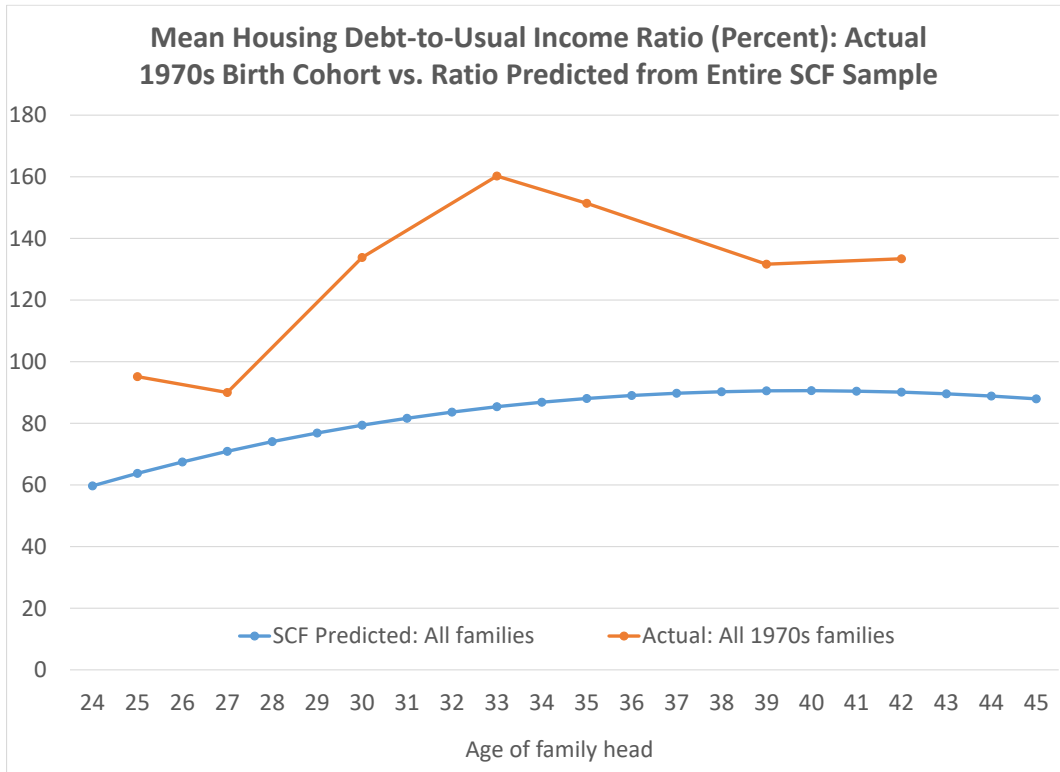
**Figure 7**



**Figure 8**



**Figure 9**



**Figure 10**

